A PLAIN-SPEAK PLAN

USA SURVIVAL GUIDE

A Plain-Speak Plan for Every Kind of Emergency in the United States



GET READY | WHEN IT HAPPENS | AFTER IT HAPPENS

ANDREW DOMINGUEZ

FOR EVERYDAY FAMILIES IN ALL 50 STATES

TRINFINITY Enterprises

USA Survival Guide

A Plain-Speak Plan for Every Kind of Emergency in the United States

Andrew Dominguez

USA Survival Guide: A Plain-Speak Plan for Every Kind of Emergency in the United States

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Introduction

This book is for everyday American households. If you rent an apartment, own a house, live alone, raise kids, care for a parent, or are getting older yourself, it was written with you in mind. You don't need a bunker, a big budget, or a background in the military. You need a few good habits, some supplies you build up over time, and a plan your family actually knows.

I wrote this guide to be calm and practical. It covers the emergencies that really happen in the 50 states and the District of Columbia, and it tells you what to do before, during, and after them in plain words.

I started working in the utility field in 1987 and have spent nearly forty years around the systems we all take for granted. I have seen how fragile they are when severe weather or equipment failures hit. When the grid goes down or roads close, help can take days to arrive, and families are on their own. I wrote this guide to give ordinary households a practical plan before an emergency happens.

What "survival" really means

When people hear the word "survival," they often picture something out of a movie. That's not what this book is about. For most of us, survival means getting through a bad few days without getting hurt, getting sick, or losing more than we have to.

Most emergencies are local and short. A storm knocks out power for a day or two. A water main breaks and your town is told to boil water. A wildfire or a chemical spill forces part of a county to leave home for a while. These events are serious, but they usually end, and life goes back to normal.

The catch is the gap between the moment trouble starts and the moment help reaches you. The Federal Emergency Management Agency (FEMA) puts it simply on its Ready.gov site: after an emergency, you may need to survive on your own for several days. Firefighters, police, utility crews, and relief groups do amazing work, but in a big event they have a lot of people to reach. The first days are often on you.

That's the whole point of getting ready. If your household can take care of itself for a while, the people who respond can focus on the neighbors who truly can't.

You might ask, "Isn't this a lot of worry over things that may never happen?" It's simple: getting ready is not about worry. It's about having a flashlight that works, water in the closet, and a plan everyone knows, so that when the lights go out, you're annoyed instead of afraid.

How this book is organized

The chapters are grouped into four parts. You don't have to read them in order, but I'd start with Part 1.

Part	Chapters	What it covers
Part 1: Get Ready	1 to 10	Learning your local risks, making a family plan, storing water and food, building kits, alerts, deciding to stay or go, first aid, home safety, and power outages

Part	Chapters	What it covers
Part 2: When It Happens	11 to 25	One chapter for each kind of emergency, from hurricanes and earthquakes to money trouble and being stranded in your car
Part 3: After It Happens	26	Recovering after a disaster: safety, insurance, help programs, and avoiding scams
Part 4: Checklists and Forms	27	Fill-in pages and checklists you can copy and keep with your plan

Part 1 is the foundation. Chapter 1 helps you find out which hazards matter where you live, so you can spend your time and money on the right things. Chapter 2 walks you through a family emergency plan. Chapters 3 through 5 cover water, food, and kits. Chapters 6 through 10 cover alerts, evacuating or sheltering in place, first aid, home safety, and power outages.

Part 2 is the "what do I do now?" section. Each chapter in that part follows the same pattern: what the hazard is and where it happens, the alert words you'll hear, what to do before, during, and after, and notes for kids, older adults, people with disabilities, pets, and renters. If a storm is on the way, you can open the right chapter and get to work.

Part 3 is about the weeks after, when you're cleaning up, filing claims, and looking for help. Part 4 holds the checklists and forms. Each chapter also ends with a short checklist so you can see your next steps at a glance.

Start small: three steps for this week

Reading a whole book about emergencies can feel like a lot. So don't try to do it all at once. If you only do three things this week, make them these.

Step 1: Sign up for local alerts

Find out how your city or county sends emergency alerts and sign up. Many counties and cities run their own alert services that you sign up for. In California, for example, the state's Office of Emergency Services says every county offers free emergency alerts, and it urges people to sign up in the county where they live, the county where they work, or both. A quick search for your county name plus "emergency alerts" usually finds it, or call your county's emergency management office. Chapter 6 covers every kind of alert in detail.

Step 2: Store some water

Ready.gov recommends at least one gallon of water per person per day for several days, for drinking and sanitation. Start with what you can. A few cases of store-bought bottled water on a closet floor is a fine beginning. Store it in a cool, dark place. If you fill your own containers, use food-grade ones and replace that water every six months. Chapter 3 covers water in depth, including how to make water safe to drink.

Step 3: Make a family contact plan

Write down the phone numbers that matter: family members, a friend or relative who lives out of the area, your doctor, your kids' school. Many of us couldn't dial our own family members' numbers without our phones. Put a copy in every wallet, backpack, and purse. Then agree on where your household will meet if you can't get home or can't reach each other. Chapter 2 walks you through the whole plan.

Tip: Put a reminder on your calendar for one week from today: "Alerts, water, contact plan." Checking off three small things builds more readiness than reading ten articles.

Build it a little at a time

You don't need to buy everything this month. In fact, I'd rather you didn't. Most of what you need is already in your home: flashlights, blankets, canned food, a first aid kit, a backpack. Gather it in one place first, then fill the gaps.

A good habit is to add one or two items each time you shop: a gallon of water, an extra can of beans, a pack of batteries. In a few months you'll have a solid supply without a big bill. Chapters 3, 4, and 5 show you what to aim for.

Skip the gadgets you don't know how to use. A plain flashlight you can find in the dark beats a fancy tool still in its box.

A calm mindset

The most useful thing you can bring to an emergency is a steady head. Being prepared helps with that. When you already know what to do, you spend less energy on panic and more on the next right step.

In an emergency, start with the basics. Get yourself and your family away from immediate danger. Call 911 if someone is hurt or in danger. Then get information from a trusted source before you act on rumors.

Caution: If someone is hurt, trapped, or in danger, call 911 first. This book can help you get ready, but it is not a replacement for emergency responders.

Follow official instructions first

When local officials tell you to evacuate, shelter in place, or boil your water, do it. They can see things you can't: the river gauge upstream, the path of the fire, the wind direction carrying a chemical cloud. If the officials say leave, leave.

This book gives you general guidance that works in most places. Your local emergency management office, fire department, and the National Weather Service (NWS) know your area. When their instructions differ from what you read here, follow theirs.

Help your neighbors

Prepared households are the ones who can help. Once your own family is safe, check on the people around you, especially older neighbors, people who live alone, and families with new babies or someone who is sick. A knock on the door, a shared flashlight, or a ride to a cooling center can matter a great deal.

It also helps to talk with neighbors before anything happens. Learn who has a medical need, who has young kids, and who might need help leaving in a hurry. A street that knows each other recovers faster.

A word about changing guidance

Emergency advice gets updated as agencies learn more. The guidance in this book was checked against official sources in October 2026. Some things will change: a phone number, a website, the name of an alert, or the best way to do something.

When you want the latest word, check Ready.gov, the website of FEMA's Ready Campaign, and your state and local emergency management offices.

For weather, check the National Weather Service at weather.gov. If something you read here doesn't match what those sources say today, go with the current official advice.

How to use this book

Read Chapters 1 and 2 first. They help you decide what matters most for your household. Then work through the rest of Part 1 at your own pace. Skim Part 2 so you know what's there, and read closely the chapters for hazards that apply where you live. Keep this book somewhere you can grab it when the power is out.

Mark it up. Write your county's alert service in the margin, circle the hazards that apply to you, and fill in the forms in Chapter 27. A book with your own notes in it is far more useful in an emergency than a clean one.

Quick checklist

- ☐ Sign up for your city or county emergency alerts
- ☐ Store some water, aiming for one gallon per person per day for several days
- ☐ Write down key phone numbers, including an out-of-area contact, and give a copy to everyone in the household
- ☐ Pick a place to meet if you can't get home
- ☐ Gather the emergency supplies you already own in one spot
- ☐ Read Chapter 1 to learn the hazards where you live
- ☐ Bookmark Ready.gov and your local emergency management website

Part 1: Get Ready

Chapter 1: Know Your Risks: Hazards Where You Live

A family on the Louisiana coast and a family in the mountains of the West both need water, a flashlight, and a plan. After that, their lists start to look very different. One worries most about storm surge from hurricanes. The other worries most about wildfire. Knowing which hazards matter where you live is how you spend your time and money on the right things.

This chapter shows you how to look up your own risk with free official tools, gives you a region-by-region overview, covers the hazards that can happen almost anywhere, and helps you spot the man-made hazards near your home. By the end, you'll have a short list of the chapters in Part 2 that deserve your closest reading.

Why "where you live" matters so much

Most of what you'll do to get ready is the same everywhere: store water and food, build kits, make a plan, sign up for alerts. Chapters 2 through 10 cover that. But the details change with the ground under your feet. A safe room makes sense in tornado country. Strapping your water heater to the wall makes sense in earthquake country. Knowing your evacuation zone matters a great deal on the coast and hardly at all in Kansas.

You might ask, "Can't I just get ready for everything?" You can, in a general way, and the basics in Part 1 do exactly that. But nobody has the time or money to prepare equally for every hazard on the map. Figure out your top two or three, prepare well for those, and keep the basics in place for the rest.

How to look up your own risk

You don't need to be an expert to find out what threatens your area. A handful of free government tools will tell you most of what you need in under an hour. Have your street address handy.

The FEMA National Risk Index

The Federal Emergency Management Agency (FEMA) runs an online map called the National Risk Index. It is an interactive tool that shows the risk from natural hazards for every county and for smaller areas called Census tracts. It covers 18 natural hazards and rates each place on expected yearly losses, how vulnerable the people there are, and how well the community can bounce back.

To use it, search "FEMA National Risk Index," open the interactive map, and find your county or Census tract. Look at which hazards rank highest for you. Don't panic over the overall score. What you want is the short list of hazards at the top.

The 18 hazards are avalanche, coastal flooding, cold wave, drought, earthquake, hail, heat wave, hurricane, ice storm, landslide, lightning, riverine (river) flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, and winter weather.

Flood maps and flood zones

Flooding gets its own tool because it is so common. FEMA puts it plainly: anywhere it can rain, it can flood. FloodSmart, the website of the National Flood Insurance Program (NFIP), says that since 1996, 99% of U.S. counties have been impacted by flooding.

FEMA's Flood Map Service Center at msc.fema.gov lets you search by address and see the official flood map for your property. A flood zone is an area on that map with a letter code that describes its flood risk:

Flood zone letters	What they mean
Zones starting with A or V	High-risk areas. FloodSmart says these have a 1 in 4 chance of flooding over a 30-year mortgage.
Zones B, C, and X	Moderate- to low-risk areas. Flooding still happens here.

Here's the part many people miss: being outside a high-risk zone does not mean you're safe. FloodSmart reports that from 2014 to 2024, almost one-third of NFIP flood claims came from areas outside high-risk flood areas. Chapter 2 covers flood insurance, and Chapter 13 covers floods in detail.

Earthquake hazard maps

The U.S. Geological Survey (USGS) publishes the National Seismic Hazard Model, a set of maps that show how likely damaging shaking is across the country. In its 2024 update, USGS said nearly 75 percent of the U.S. could experience damaging earthquake shaking. California and Alaska have the greatest chance, and Hawaii also has high potential. The update also pointed to risk along the central and northeastern Atlantic coast, including Washington, D.C., Philadelphia, New York, and Boston. And 37 states have had earthquakes larger than magnitude 5 in the last 200 years.

Magnitude is the number scientists use to describe the size of an earthquake. Chapter 15 covers earthquakes.

Wildfire risk

The U.S. Department of Agriculture (USDA) Forest Service built a free website called Wildfire Risk to Communities at wildfirerisk.org. It was created at the direction of Congress, and it shows the relative wildfire risk for communities across the United States, with a focus on homes and other buildings. Maps and data are available for your community, county, and state.

Wildfire is not only a problem for remote forests. The U.S. Geological Survey calls fire "a new year-round reality across much of the U.S." If the tool shows higher risk for your community, read Chapter 14 closely.

Your state and county emergency management office

Your state has an emergency management agency, and many counties and cities have their own office too. They plan for disasters where you live, and their websites are often the best place to learn about local hazards, evacuation routes or zones, and how to sign up for local alerts.

Search for your county name plus "emergency management." Look for a page on local hazards or a hazard plan. If you can't find one, call.

> **Tip:** Call or email your county emergency management office and ask, "What are the top three hazards for my address?" It's a fair question, and helping residents prepare is part of their job.

Region by region: an overview

The table below is a starting point, not the final word. Each region is big, and risk changes from one county to the next, even from one street to the next. A house on a hill and a house by the creek a mile away can face very different flood risk. Use the table to get your bearings, then use the tools above to check your own address.

I kept this table conservative on purpose. It lists only hazards that federal or state agencies name for each area. Leaving a hazard out does not mean it can't happen there. Flooding, for example, can happen almost anywhere, as you'll see in the next section.

Region	Major hazards to look into	See chapters
Northeast	Nor'easters (heavy rain or snow, strong winds, sometimes coastal flooding); hurricanes and storm surge along the coast; lake-effect snow near the Great Lakes; flooding; damaging earthquake shaking is possible in parts of the region	11, 13, 15, 17
Southeast	Hurricanes and storm surge along the coast; severe thunderstorms and tornadoes, especially in spring; flooding, including inland flooding from tropical storms; earthquakes in South Carolina and in the New Madrid seismic zone (parts of Tennessee, Kentucky, and Arkansas)	11, 12, 13, 15
Gulf Coast	Hurricanes and storm surge (Louisiana and Mississippi are especially exposed to surge); flooding from heavy rain; tornadoes that come with landfalling tropical storms; spring severe storms	11, 12, 13
Midwest	Severe thunderstorms and tornadoes, especially in spring; flooding; lake-effect snow near the Great Lakes; earthquakes in the New Madrid seismic zone (southeastern Missouri and nearby states)	12, 13, 15, 17
Great Plains	Severe thunderstorms and tornadoes, especially in spring; flooding; blizzards on the northern Plains	12, 13, 17
Southwest	Extreme heat; flash floods during the summer monsoon; wildfire, including in the driest desert areas	13, 14, 18
Mountain West	Wildfire; flash floods and debris flows, especially below recently burned land; earthquakes in parts of the Intermountain West, such as Nevada, Utah, Idaho, and Montana; severe winter storms and heavy mountain snow, with deadly avalanches in high country such as Colorado	13, 14, 15, 16, 17

Region	Major hazards to look into	See chapters
Pacific Coast	Earthquakes; tsunamis; volcanoes in California, Oregon, and Washington; wildfire	14, 15, 16
Alaska	Earthquakes; tsunamis; volcanoes; wildfire; harsh winters with blizzards, heavy snow and extreme cold; coastal flooding from strong storms	13, 14, 15, 16, 17
Hawaii	Hurricanes; tsunamis; volcanoes; earthquakes; floods; wildfire; landslides; drought	11, 13 to 16, 18

A few notes on the table.

The coasts

The National Hurricane Center (NHC) says every location along the U.S. East and Gulf coasts is vulnerable to storm surge, an abnormal rise in water level pushed up by a storm, above the normal tide. The National Weather Service adds that storm surge can travel several miles inland, especially along bays, rivers, and estuaries, and that heavy rain from these storms often causes flooding hundreds of miles inland. So if you live a few hours from the ocean, don't skip Chapter 11.

The Atlantic hurricane season runs from June 1 to November 30.

On the West Coast and in Alaska and Hawaii, the ocean hazard to know is the tsunami, a set of dangerous ocean waves that Chapter 16 explains in detail. The National Oceanic and Atmospheric Administration (NOAA) rates the tsunami hazard as high to very high for Alaska, Hawaii, and the U.S. West Coast. It rates the Atlantic coast very low to low and the Gulf Coast very low.

Earthquakes and volcanoes

USGS identifies 161 U.S. volcanoes that pose potential threats to people and property. The 18 highest-threat volcanoes are in Alaska, California, Hawaii, Oregon, and Washington. Kilauea, in Hawaii, has the highest threat score of all. Chapter 16 covers volcanoes.

Earthquakes are not only a West Coast worry. The USGS keeps a list of high-priority faults in the Intermountain West, which includes states such as Nevada, Utah, Idaho, and Montana. In the central U.S., the New Madrid seismic zone runs through northeastern Arkansas, southwestern Kentucky, southeastern Missouri, and northwestern Tennessee. Its earthquakes in 1811 and 1812 are estimated at magnitude 7 to 8. In South Carolina, a USGS study puts the 1886 Charleston earthquake at about magnitude 7. Chapter 15 covers earthquakes in detail.

The Southwest and the West

The NWS office in Phoenix says heat is the deadliest weather in Arizona. In New Mexico, the NWS lists the monsoon season as June 15 to September 30. Flash floods, which usually hit within six hours of heavy rain, are the most dangerous kind of flood.

USGS expects wildfires across the West to keep increasing in frequency, size, and severity, and it predicts more frequent and severe fire in Alaska too. Land that has burned can also send floods of mud and rock downhill

when it rains. The NWS in Albuquerque notes that most burned areas are prone to these debris flows for at least two years.

The northern Plains

Winter can be fierce in the middle of the country. The NWS office in Grand Forks, North Dakota, says the Red River Valley of eastern North Dakota and western Minnesota averages 2.6 blizzards a year. Chapter 17 covers winter storms.

Tornado country

Severe weather follows the calendar. NOAA's Climate.gov describes April to June as the peak of tornado season, with the highest chance of severe weather spreading north and east across the Plains, the Midwest, and the Southeast as spring goes on. But as the next section shows, tornadoes are not limited to those regions.

Hawaii

The Hawaii Emergency Management Agency names nine natural hazards for the islands: hurricane, volcano, landslide, wildfire, earthquake, tsunami, flood, drought, and erosion. If you live in Hawaii, nearly every chapter in Part 2 applies to you.

Hazards that can happen almost anywhere

Some hazards don't care which region you live in. Every household should plan for these, whatever the map says.

Floods

As FEMA says, anywhere it can rain, it can flood. FloodSmart says that since 1996, 99% of U.S. counties have been impacted by flooding. Flash floods, overflowing creeks, and water pouring off pavement can hit places that have never been in a flood zone. Chapter 13 covers floods, and Chapter 2 covers flood insurance.

Tornadoes and severe storms

The National Weather Service says tornadoes have been reported in all 50 states, and they can strike at any time of day or year. They are most common in the Central Plains and the Southeast, but no state is off the list. Chapter 12 covers tornadoes and severe thunderstorms.

Power outages

Storms and equipment problems can cut the power in any state, in any season. A long outage changes everything from food safety to staying warm or cool. Chapter 10 covers power outages.

Home fires

A house fire is the emergency that can strike one household alone, with no storm and no warning. Ready.gov says a fire can become life-threatening in about two minutes. Smoke alarms and an escape plan matter in every home in the country. Chapter 9 covers them.

Heat and cold

Heat is the number one weather-related cause of death in the United States, according to the National Weather Service. You don't have to live in the desert for a heat wave to be dangerous. The Centers for Disease Control and Prevention (CDC) says older adults, young children, and people with chronic medical conditions are at high risk. Cold weather is hard on older adults, too. Chapters 17 and 18 cover cold and heat.

Disease outbreaks and disruptions

Outbreaks of illness, cyberattacks on the systems we depend on, and money trouble don't follow weather maps either. Chapters 19, 23, and 24 cover those.

Man-made hazards near you

Not every emergency comes from the weather. Some come from the things we build and move: trains, trucks, pipelines, factories, and power plants. These accidents are not common, but they can happen with little warning, so it helps to know what's near you before anything happens.

Take a look at the map around your home, your work, and your kids' schools. Look for:

- Rail lines, especially freight lines that carry tanker cars
- Major highways and interstates, where trucks carry fuel and chemicals
- Factories, chemical plants, refineries, and water treatment plants
- Pipelines (the Pipeline and Hazardous Materials Safety Administration says pipelines are marked with above-ground markers, often where they cross streets, highways, and railways)
- Nuclear power plants

You don't need to move because a rail line runs past your town. Just know it's there, so that if officials tell you to stay inside or to leave, you understand why and you're ready to act.

Your area is covered by a Local Emergency Planning Committee (LEPC), a group set up under a federal law that plans for chemical accidents in the community. The Environmental Protection Agency (EPA) says there are more than 3,000 of these planning districts. These committees must make information about chemicals in the community available to the public and must review their emergency plan at least once a year. To find yours, contact your State Emergency Response Commission, which your state emergency management agency can point you to.

Living near a nuclear power plant

The Nuclear Regulatory Commission (NRC) sets up two planning zones around each nuclear power plant. The first reaches about 10 miles from the plant. People in that zone may be told to shelter in place, evacuate, or take potassium iodide pills. The second reaches about 50 miles. In that larger zone, the main concern is keeping contaminated food and water out of the food supply.

If you live within 50 miles of a plant, and especially within 10, ask your county emergency management office what the plan is for your area, how you would be warned, and which way you would evacuate. Chapter 21 covers radiation emergencies.

Chapter 20 covers chemical spills and pipeline leaks, and Chapter 7 covers deciding whether to shelter in place or evacuate.

Watch, warning, and advisory: the three words to know

As you look into your risks, you'll keep running into three words the National Weather Service (NWS) uses for its alerts. They sound alike, but they mean different things, and the difference tells you how fast to move.

Alert word	What it means	What you do
Watch	Conditions are favorable for the hazard in and near the watch area. It may happen, but it isn't happening yet.	Get ready. Review your plan, charge your phone, and keep an eye on the news.
Warning	The hazard is happening now or is about to, and it poses a risk to life and property.	Act now. Follow your plan and any instructions from officials.
Advisory	The hazard is happening now or is about to, but it is expected to cause nuisance conditions rather than a serious threat to life and property.	Be careful. Adjust your plans and use caution.

Here's an easy way to remember it. A watch means keep watching the sky and the news. A warning means take action. An advisory means be careful. The NWS New York office says watches can go out up to 72 hours ahead, while warnings and advisories go out up to 48 hours ahead, when forecasters are more certain.

Chapter 6 covers alerts in detail, including how they reach your phone and how to sign up for local ones.

Renters and owners: different risks, different jobs

Your hazards don't change based on whose name is on the deed, but your responsibilities do.

If you own your home, you control the building. You decide whether to strap the water heater, clear brush away from the house, raise the furnace above flood level, or add a storm shelter. Your insurance covers the structure, so it's on you to know what that policy leaves out. Chapter 2 walks through the insurance questions to ask.

If you rent, the landlord handles the building, but your belongings and your safety are on you. Ask your landlord or building manager a few questions:

- Where are the shutoffs for water, gas, and electricity, and who is allowed to use them?
- Where is the safest place in the building during a tornado or severe storm?
- What is the building's evacuation plan, and where do tenants meet?
- Are smoke alarms and carbon monoxide alarms working in my unit? (Chapter 9 covers both.)

Renters should also look up their own flood zone and hazards, just like owners. Don't assume the landlord's insurance covers your furniture, clothes, or electronics. Ask, and read Chapter 2, which explains renters insurance and flood coverage for renters.

If you live in a mobile or manufactured home, give wind hazards extra attention. The National Weather Service notes that hurricane winds can destroy manufactured homes, and the hurricane and tornado chapters (Chapters 11 and 12) tell you when to leave one for a sturdier building.

Make your own hazard list

Now put it together. Spend an evening with the tools in this chapter and fill in a short list like the one below. Circle the hazards that rank high for your address, and write down where you found the answer. Chapter 27 has a full-page version of this worksheet.

Hazard	My risk (high, medium, low)	Where I checked	Chapter
Flood			13
Tornado and severe storms			12
Hurricane			11
Wildfire and smoke			14
Earthquake			15
Tsunami, volcano, landslide			16
Winter storm and cold			17
Extreme heat			18
Chemical or pipeline accident			20
Nuclear power plant within 50 miles			21

Once you have your list, pick your top two or three hazards. Those are the ones to plan around first. When you build your kits in Chapter 5, add the items those hazards call for. When you make your family plan in Chapter 2, decide what you'll do for each one: where you'll shelter, when you'll leave, and where you'll go.

Check your list again whenever you move, and every year or so. Maps get updated, new homes get built in the hills, and your own household changes. Ready.gov suggests re-thinking your emergency needs every year, and your hazard list is a good place to start.

Quick checklist

- ☐ Look up your county or Census tract on the FEMA National Risk Index
- ☐ Search your address on the FEMA Flood Map Service Center at msc.fema.gov
- ☐ Check your community on wildfirerisk.org
- ☐ Find your state and county emergency management websites and bookmark them
- ☐ Note any rail lines, highways, chemical plants, pipelines, or nuclear plants near home, work, and school
- ☐ Write down your top two or three hazards and the chapters that cover them
- ☐ Learn the difference between a watch, a warning, and an advisory
- ☐ Renters: ask your landlord about shutoffs, shelter areas, and the building evacuation plan

Chapter 2: Your Family Emergency Plan

Supplies get most of the attention, but a plan is what holds everything together. When the alert goes off at 2 p.m. on a school day, your kids are in one building, you're at work, your partner is on the highway, and the phones are jammed. That's when a plan your whole household already knows does its job.

This chapter walks you through building that plan, one piece at a time: how you'll find each other, who you'll call, where you'll meet, and how you'll handle the people and pets who need extra help. It also covers your important papers, a record of what you own, and the insurance questions to ask now, before you need the answers. None of it costs much. Most of it takes an evening at the kitchen table.

We live in Dayton, Nevada, with our grown daughters and granddaughters not far away. Most families assume they can just call each other in an emergency. My wife and I sat down and agreed on where we would meet and how we would check in if the cell towers went dark. Writing down a simple family plan takes less than an hour and keeps panic from taking over.

Start with the basics

A family emergency plan answers a few simple questions. How will we get alerts? Where will we go if we have to leave, and how will we get there? How will we reach each other? Where will we meet? What about the pets? Ready.gov offers a fill-in family emergency plan form at ready.gov/plan-form, with spaces for emergency contacts, meeting places, and medical information, and Chapter 27 of this book has one too.

State agencies break the job into steps. The Indiana Department of Homeland Security, for example, lists four:

1. Meet with your family.
2. Decide on your meeting location and list contact information.
3. Plan what to do with your pets.
4. Describe your evacuation route, and have a backup plan in case the main route is cut off.

That's a good order to work in. The rest of this chapter takes each piece in turn.

Sit down with everyone in your household, including kids old enough to understand. Talk through your top hazards from Chapter 1 and what you'd do for each. Write the answers down. A plan that lives only in one person's head is not a plan; it's a hope. Chapter 27 has fill-in forms you can copy.

Where you'll meet

Ready.gov puts the reason for a plan plainly: you may not be together when disaster strikes, so you need to know how you'll reconnect if you're separated. Pick meeting places ahead of time so nobody has to guess.

Meeting place	Use it when	Example
Right outside your home	There's a sudden emergency at home, like a fire	The mailbox, a neighbor's driveway, or a big tree across the street
In your neighborhood	You can't get home or can't reach each other, but the area is safe	A library, a place of worship, a relative's house, or a community center

Meeting place	Use it when	Example
Outside your town	Your neighborhood has to be evacuated	A friend's or relative's home an hour or two away

Choose places everyone can find, including kids, and that are likely to be open or reachable. Write the addresses down. Talk about how each person would get there from school, work, or wherever they usually are during the day.

Your out-of-area contact

Pick one friend or relative who lives out of the area to be your household's contact person. Everyone checks in with that one person, and that person passes along news.

Why someone far away? The Indiana Department of Homeland Security puts it well: during a disaster, everyone in your local area may be affected too, and out-of-state calls may be easier to make when local lines are overwhelmed. The Federal Communications Commission (FCC) gives the same advice: designate someone out of the area as a central contact, and make sure every family member knows who to contact if you're separated.

Make sure your out-of-area contact agrees to the job and knows it. Give them the names and numbers of everyone in your household.

Text first, call second

When a disaster hits, everyone grabs a phone at once and the networks get crowded. The FCC says that in many cases a text message will go through when a call won't. Its tips for communicating in an emergency are worth teaching the whole household:

- Text instead of calling when you can.
- Keep calls short and limit them to vital information. This also saves your phone battery.
- If a call doesn't go through, wait 10 seconds before redialing so the network can clear.
- If one way doesn't work, try another: text, email, or a landline if you have one.
- Keep charged batteries and a car charger for your phone.
- Keep a list of emergency numbers in your phone.
- If you have a landline, keep at least one corded phone. Cordless phones usually won't work when the power is out.

Teach everyone in the house, including older kids and older parents, how to send a text message. It sounds basic, but it matters. Agree on a short message format, such as "I'm OK. At school. Will go to Grandma's at 5."

> **Tip:** Put "ICE" (in case of emergency) entries in your phone contacts and write the same numbers on paper. A dead phone holds nothing.

Write down the numbers that matter

Most of us couldn't dial a family member's number from memory. Make a contact card for each person in the household, small enough for a wallet, backpack, or purse. Include:

- Each household member's cell phone, work, and school numbers
- Your out-of-area contact
- Your meeting places
- Your doctors and pharmacy
- Your insurance companies and policy numbers
- Your utility companies
- Local non-emergency numbers for police and fire

Update the cards when numbers change. Chapter 27 has a contact card you can copy.

Planning for everyone in your household

Every family is different, and the best plan fits the people in it. Think about each person in your home: their age, their health, how they get around, what languages they speak, what medicine or equipment they rely on, and whether they have a pet or service animal. Then make sure the plan covers each of them.

Kids

Find out the emergency plan at your child's school or daycare. Ask:

- Will they keep children at school during an emergency, or send them home?
- Where will they take children if they have to evacuate?
- How will they contact parents?
- Who is allowed to pick up your child, and what do they need to show?

Make sure the school has current contact information, including at least one backup adult who can pick up your child if you can't get there. Then make sure that adult knows they're on the list.

Talk to your kids about the plan in a calm way. Practice meeting at your spots. A calm talk now makes a scary day a little easier later.

Older adults

Ready.gov's advice for older adults starts with people. Build a support network of family, friends, and others who can help you in an emergency, and make sure someone in it knows how to use any lifesaving equipment you rely on or how to give you your medicine. Talk with your doctors and other care providers to find out their emergency plans and to identify backup providers. Plan ahead for how you'll get out if you need help evacuating, and how you'll bring your walker, wheelchair, or other assistive devices with you.

Pack your kit with your medicines, medical supplies, and batteries and chargers for any devices. Chapter 5 covers kits, and Chapter 8 covers managing medications.

If you help care for an aging parent who lives alone, you're part of that support network. Know their plan, keep a copy of their medication list, and agree on how you'll check on them.

People with disabilities and access needs

If you or someone in your home has a disability, plan for the help you'll need and who will provide it. The Centers for Disease Control and Prevention (CDC) suggests keeping information about your health needs with you during emergencies and wearing your medical alert tag if you have one. It also warns that even if you plan for accessible transportation, it may not be available in an emergency, so contact your local paratransit

provider or local government ahead of time. If you go to a shelter, tell the shelter workers about your needs when you arrive.

If you have a personal care attendant, the FCC suggests working out how you'll reach each other if you're separated. If you use a medical alert system, know that most need a working phone line, so keep a cell phone as a backup.

If someone in your home uses medical equipment that needs electricity, Chapter 10 covers planning for power outages.

Service animals and pets

The CDC says shelters must allow service animals by law. Under the Americans with Disabilities Act (ADA), service animals are limited to dogs and, in some cases, miniature horses. Bring your service animal's supplies with you, just as you would your own.

Pets are a different story. The CDC notes that pets may not be allowed in local shelters unless they are service animals, and that many disaster evacuation centers, including Red Cross evacuation centers, do not accept pets. Ready.gov says not all shelters accept pets, so plan for alternatives. Policies vary, so check with your local emergency management office about pet-friendly shelters in your area.

Here's what the CDC suggests:

- Find shelters, out-of-town friends or relatives, or pet-friendly hotels where your pets can stay, especially along your evacuation route.
- Make sure your pets wear collars and tags with up-to-date contact information.
- Microchip your pets, register the microchip with the manufacturer, and keep your contact information current. A microchip is one of the best ways to be reunited if you're separated.
- Set up a buddy system with a trusted neighbor who can check on your animals, and evacuate them if needed, when you're not home.
- Ask your veterinarian to help you gather your pet's records, including rabies and other vaccinations, prescriptions, and medical history.

If you evacuate, take your pets with you. The CDC warns that pets left behind may be lost, injured, or worse. Never leave a pet chained outdoors. Chapter 5 covers a pet emergency kit.

Commuters and people who work away from home

If you spend hours a day away from home, your plan should cover the trip. Think about what you'd do if roads, trains, or bridges closed while you were at work. Keep a small kit at work and in your car (Chapter 5). Know at least two ways home, and know when you'd stay put at work instead of trying to get home.

Split households and shared custody

If your kids live in two homes, both homes need to know the plan. Agree on who picks up the kids from school in an emergency, where they'll go, and how you'll reach each other. Give both homes the same contact cards. This is one area where cooperation pays off for everyone.

Important documents

After a disaster, you may need to prove who you are, that you own or rent your home, and what insurance you have. Getting copies of lost papers is slow, so plan now.

Gather these papers, or copies of them, in one place. This list is based on a documents checklist from the Wisconsin Council on Physical Disabilities, published through the Wisconsin Department of Health Services:

- Identification: driver's licenses or state IDs, passports, birth certificates, Social Security cards, and proof of citizenship
- Home and car: deed or lease, mortgage papers, recent utility bills, and vehicle titles and loan papers
- Insurance: home or renters, flood, auto, health, and life policies, with policy numbers and phone numbers
- Medical: copies of prescriptions, immunization records, and medical wallet cards
- Money: bank account numbers and last year's tax returns
- Legal: wills, living wills, and health care and financial powers of attorney
- Pets and service animals: vaccination and vet records, microchip information, and service animal paperwork
- A recent photo of each family member and pet, which helps if you're separated

Ready.gov suggests storing important papers such as insurance policies, deeds, and property records in a safe place, such as a safety deposit box away from home, and making copies for your emergency kit. Its kit list says family documents such as insurance policies, identification, and bank records can be saved electronically or kept in a waterproof, portable container. I'd do both: put paper copies in a sealed waterproof bag, and keep a digital copy, such as on a flash drive, somewhere safe. If the originals are lost, you'll still have what you need.

Ready.gov also points to the Emergency Financial First Aid Kit (EFFAK), a joint publication from Operation Hope and the Citizen Corps program of the Federal Emergency Management Agency (FEMA) that helps you identify your important documents, medical records, and household contracts. You can find it on ready.gov/financial-preparedness.

Keep a small amount of cash at home in a safe place, too. Ready.gov recommends small bills, because ATMs and credit cards may not work during a disaster.

Make a home inventory

A home inventory is a record of what you own. If you ever have to file an insurance claim, it makes the job much easier and helps you remember things you'd otherwise forget.

You don't need special software. Walk through your home with your phone and record a video, room by room. Open closets and drawers. Say what things are as you go, and mention anything valuable or recently bought. Take photos of receipts, serial numbers, and model numbers for big items like appliances and electronics.

Ready.gov suggests taking photos or a video of both the inside and the outside of your home, and including your personal belongings in the inventory.

Store a copy somewhere other than your home, such as a secure cloud account or with a relative. Update it once a year or after a big purchase.

Review your insurance

Insurance is the part of emergency planning most people skip, and it's the part that can matter most for getting back on your feet. You don't need to become an expert. You do need to know what your policy covers and what it doesn't. Call your agent or company and ask.

Here are the big questions to ask:

Does my policy cover flooding?

Probably not. FloodSmart, the official site of the National Flood Insurance Program (NFIP), says homeowners and renters insurance typically does not cover flooding from natural disasters. Ready.gov says the same about homeowners insurance. Flood coverage is usually a separate policy.

You can buy federally backed flood insurance through the NFIP whatever your flood zone, as long as your community takes part in the program, and more than 22,000 communities do.

Don't wait for the forecast. NFIP policies generally have a 30-day waiting period after you buy them before they take effect. There are a few exceptions. FEMA's NFIP brochure says that if you buy the policy as part of getting, changing, or renewing a loan on your property, coverage can start when the loan closes. The waiting period may also not apply when flooding is caused by a wildfire in your community. For most people, though, the rule holds: a policy won't cover a flood that happened before it took effect, and you can't raise your coverage once a flood has begun. If you shop for flood insurance when a storm is already on the map, it's likely too late for that storm.

Renters, this applies to you too. FloodSmart says renters can buy a flood policy that protects their personal property, such as furniture, appliances, and clothing. Insuring the building itself is the property owner's job, but your belongings are yours to protect.

Does my policy cover earthquakes?

No, not with a standard policy. FEMA says plainly that standard homeowners insurance does not cover earthquake damage. Earthquake insurance may be sold as an add-on to your homeowners policy, called an endorsement, or as a separate policy. Expect a high deductible. The deductible is usually a percentage of the coverage on the house itself, not a flat dollar amount. FEMA's homeowner's guide says it is typically 10 to 20 percent, and the same guide mentions deductibles as high as 25 percent. On a house insured for $300,000, a 15 percent deductible means you pay the first $45,000 of damage. If you live in a condo, mobile home, or manufactured home, your options will likely be different.

If Chapter 1 showed earthquake risk where you live, get a quote and weigh it against what it would cost you to repair or rebuild on your own.

What else should I check?

Ask your agent to walk you through these in plain words:

- What disasters does my policy cover, and which ones does it leave out?
- Does it pay to rebuild my home at today's prices, or only what the old home was worth?
- How much is my deductible, the amount I pay before insurance starts paying? Is there a separate deductible for certain kinds of storms?
- Does it pay for a place to live if my home can't be lived in for a while?
- If I rent, do I have renters insurance for my belongings, and how much does it cover?

Write your policy numbers and your insurance company's claims phone number on your contact card and keep copies of your policies with your important documents.

You might ask, "Isn't that what FEMA is for?" Not really. FEMA itself warns that its help for individuals after a disaster is not guaranteed and may cover only part of what you need to recover. For most households, insurance is the main protection. Chapter 26 covers recovery help after a disaster.

Caution: Insurance rules vary by state and by policy. Read your own policy, ask your agent questions in writing if needed, and check your state insurance department's website for help. This book cannot tell you what your policy covers.

Practice the plan

A plan you've never practiced is just paper. Walk through it with your household. Do a fire drill at home, with everyone getting out and going to the meeting spot. Have everyone send a test text to your out-of-area contact. Drive your evacuation route once. Ready.gov suggests practicing your home fire escape plan twice a year, and that's a good rhythm for the rest of the plan too. Update the plan whenever something changes: a new job, a new school, a new baby, a move. Chapter 9 covers home fire escape plans.

Build your supplies on a budget

Getting ready does not have to cost a lot. Start with what you already own. Flashlights, blankets, a backpack, a first aid kit, and the canned food in your pantry all count. Gather them in one place first, then make a list of what's missing.

Add one or two items each time you shop. Buy extra of the canned foods you already eat. Pick up a pack of batteries when they're on sale. Keep your car's gas tank from running low. A little at a time adds up.

A small emergency fund

Many emergencies hit your wallet first. An evacuation means gas, food, and maybe a motel. A power outage can mean throwing out a full freezer. The Consumer Financial Protection Bureau (CFPB) describes an emergency fund as cash set aside for unplanned expenses, and it notes that even a small amount can give you some financial security. Keep some cash at home too, in small bills, since card readers and ATMs may not work when the power is out. Chapter 24 covers emergency funds and money trouble in detail.

Quick checklist

- ☐ Hold a household meeting and talk through your top hazards
- ☐ Pick three meeting places: outside your home, in your neighborhood, and out of town
- ☐ Choose an out-of-area contact and make sure they agree
- ☐ Make a contact card for every household member
- ☐ Learn your kids' school and daycare emergency and pickup policies
- ☐ Make a plan for anyone with medical, mobility, or other specific needs, and for pets
- ☐ Copy important documents and store them safely, on paper and digitally
- ☐ Record a video inventory of your home
- ☐ Call your insurance agent and ask about flood, earthquake, and other gaps
- ☐ Practice the plan, including a home fire drill and a test text

Chapter 3: Water

If you only do one thing after reading this book, store some water. You can go a while without a hot meal. You can't go long without water, and when a storm, an earthquake or a broken water main shuts off your tap, bottled water is often the first thing to disappear from store shelves.

This chapter covers how much water your household needs, how to store it safely, where to find extra water hiding in your home, how to make questionable water safe to drink, what boil water notices mean, what well owners should do after a flood, and how to stay clean when the water is off. Chapter 4 covers food, and Chapter 5 covers putting water into your kits.

Why water comes first

Ready.gov, the federal government's preparedness website run by the Federal Emergency Management Agency (FEMA), says a normally active person needs about three quarters of a gallon of fluid each day from water and other drinks. It also says children, nursing mothers and sick people may need more, and that in very hot temperatures water needs can double.

Water problems come in more shapes than people expect. Your tap might stop running. Or it might keep running but not be safe, because floodwater got into the system, a pipe broke, or the treatment plant lost power. In either case, the water you stored ahead of time is the water you can trust.

How much water to store

Ready.gov says to store at least one gallon of water per person per day for several days, for drinking and sanitation. Sanitation means keeping clean: washing hands, brushing teeth, and keeping your home and toilet area clean so germs don't spread.

The Centers for Disease Control and Prevention (CDC) gives a little more detail. CDC says to store at least 1 gallon per person, per day for 3 days, and to try to store a 2-week supply if possible. CDC also says to store more for pregnant women, people who are sick, pets, and for anyone who lives in a hot climate.

You might ask, "Do I really need two weeks of water?" It's simple: three days gets you through most short emergencies, and two weeks covers the bigger ones, when water systems can take longer to fix. Start with three days. Then keep adding.

Quick math for your household

Household	3 days (1 gallon per person per day)	2 weeks (1 gallon per person per day)
1 person	3 gallons	14 gallons
2 people	6 gallons	28 gallons
4 people	12 gallons	56 gallons
6 people	18 gallons	84 gallons

Add more for anyone who is pregnant, nursing, sick or living in a hot place, and add water for each pet. Chapter 5 lists CDC's pet kit guidance, which calls for a 2-week supply of water for each animal.

Caution: Ready.gov says never ration drinking water unless officials tell you to. Drink what you need today, and look for more for tomorrow. You can cut down how much you need by staying cool and resting.

Ready.gov also says not to drink carbonated or caffeinated drinks instead of water. Caffeinated drinks and alcohol dehydrate the body, which raises your need for water.

Storing water safely

The easiest option: store-bought bottled water

Ready.gov says the simplest choice is to buy commercially bottled water and keep it in its sealed original container in a cool, dark place. CDC says to observe the expiration date on store-bought water.

Filling your own containers

Filling your own containers is cheaper, and it is how many families build up to two weeks. CDC says it is best to use food-grade water storage containers approved by the Food and Drug Administration (FDA). Food-grade means the container is made of material that is safe for holding food or drink. CDC notes that surplus and camping stores often carry them.

If you can't get a food-grade container, CDC says to choose one that has a top that closes tightly and is made of durable, unbreakable material, not glass.

Caution: Never store drinking water in a container that once held toxic chemicals, such as bleach or pesticides. CDC is clear on this. No amount of rinsing makes those containers safe.

How to clean and sanitize a container

Before you fill a container, clean it and sanitize it. Sanitize means to kill most of the germs left on a surface. CDC gives these steps:

1. Wash the container and its cap with soap and water, then rinse completely with water.
2. Mix a sanitizing solution of 1 teaspoon of unscented liquid household chlorine bleach in 1 quart (4 cups) of water. Use bleach that contains 5% to 9% sodium hypochlorite (the active ingredient listed on the label).
3. Pour the solution into the container, cover it tightly, and shake it well so the solution touches all inside surfaces.
4. Wait at least 30 seconds, then pour the solution out.
5. Let the empty container air-dry before you use it.
6. Fill it with clean tap water from a safe supply and cover it with a tight lid.
7. Label it "drinking water" and write the date you filled it.

Where and how long to store it

CDC says to keep stored water in a place with a cool temperature, between 50 and 70 degrees F, out of direct sunlight, and away from toxic substances such as gasoline or pesticides. A closet, a spot under the bed, or a

basement corner away from the furnace and the paint cans all work. A hot garage next to the lawn mower fuel does not.

Ready.gov and CDC both say to replace water you bottled yourself every six months. Pick two easy-to-remember dates and swap the water then. Use the old water for plants or cleaning, then sanitize and refill.

Tip: When you pour water from a big container, use a clean scoop or pour it out. CDC says never to dip your hands into stored water.

Water hiding in your home

If the tap stops and your stored water runs low, you may have more water in the house than you think. CDC lists these as safe sources inside the home when you don't have bottled, boiled or treated water:

- The water in your hot water heater tank (the tank connected to your faucets and showers, not the boiler for a home heating system)
- Melted ice cubes, if they were made with water that was not contaminated
- Water in the toilet tank, not the bowl, if it is clear and has not been treated with toilet cleaners
- The liquid in canned fruits and vegetables

Getting water out of the water heater

An older brochure, "Food and Water in an Emergency," developed by FEMA with the American Red Cross and the U.S. Department of Agriculture, gives these steps:

1. Make sure the electricity or gas to the water heater is turned off.
2. Open the drain valve at the bottom of the tank.
3. Start the water flowing by turning off the water intake valve and turning on a hot water faucet in the house.
4. Do not turn the gas or electricity back on while the tank is empty.

Caution: Water from a water heater can be very hot. Let it cool before you drain it, and catch it in a clean container. If you have any doubt about how your water heater works, ask your utility or a plumber before an emergency.

The same guidance says you can get water out of your pipes. Turn on the faucet at the highest point in your house to let air into the plumbing, then collect the water from the lowest faucet in the house. If officials say your tap water may be contaminated, CDC notes you may need to shut off the main water valve to keep contaminated water out of your home's pipes. Chapter 9 shows how to find and close it.

Water you should not drink

- Don't drink water from radiators or the boiler of a home heating system. CDC says never to use it.
- Don't drink water from swimming pools or hot tubs. CDC says that water can be used for washing and cleaning, but not for drinking.
- Don't drink water from the toilet bowl, or from a toilet tank that has had toilet cleaner in it.
- Don't drink floodwater.

- Don't drink water that may contain fuel, toxic chemicals or radioactive material. CDC says boiling and disinfecting cannot make that water safe.

Water from outside

Rainwater, streams, rivers, ponds, lakes and springs can all carry germs, animal waste, sewage and chemicals. CDC says water from outdoor sources must be treated before you drink it. The next section shows how.

Making water safe to drink

If you are not sure your water is safe, treat it before you drink it, cook with it, brush your teeth with it, wash food with it, make ice with it or mix baby formula with it. CDC says to use bottled, boiled or treated water for all of those.

Step one: clear up cloudy water

CDC says to filter cloudy water through a clean cloth, paper towel or coffee filter, or let it settle and then draw off the clear water on top. Do this before you boil or disinfect it.

Boiling: the best way to kill germs

CDC calls boiling the best way to kill germs.

1. Bring clear water to a rolling boil for 1 minute. A rolling boil is a hard boil with big bubbles that keeps going even when you stir it.
2. If you live above 6,500 feet in elevation, boil for 3 minutes instead.
3. Let the water cool.
4. Store it in clean, sanitized containers with tight covers.

Boiled water can taste flat. CDC suggests pouring it back and forth between two clean containers and letting it stand for a few hours, or adding a pinch of salt for each quart or liter.

Disinfecting with household bleach

If you can't boil water, you can use regular unscented household chlorine bleach. Check the label first. CDC says to use bleach that contains 5% to 9% sodium hypochlorite, and if the label has its own directions for treating drinking water, follow those. EPA's current page gives the amount by strength: for 6% bleach use the amounts in this table, and for 8.25% bleach use 6 drops per gallon instead of 8.

Amount of clear water	Bleach (6% sodium hypochlorite)
1 quart or 1 liter	2 drops
1 gallon	8 drops (about 1/2 mL, a little less than 1/8 teaspoon)
5 gallons	40 drops (about 2 1/2 mL, or 1/2 teaspoon)

1. Use clean, settled or filtered water if you can.
2. Add the amount of bleach shown in the table. Use a clean medicine dropper if you have one.
3. If the water is cloudy, murky, colored or very cold, double the amount of bleach.
4. Stir well.

5. Let it stand for at least 30 minutes before you drink it.

Caution: Use only plain, unscented household bleach. Check the date on your bottle too. FoodSafety.gov suggests replacing a stored bottle of bleach each year.

Tip: Keep a small dropper bottle and a sealed, dated bottle of unscented bleach with your water supply. Replace the bleach yearly.

Water treatment tablets and drops

Water treatment tablets and drops are small products you add to water to kill germs. They are often made with chlorine dioxide, chlorine or iodine. CDC says to follow the directions on the product label, since each one is made for a certain amount of water.

CDC also notes some limits:

- Iodine and chlorine tablets do not kill Cryptosporidium, a common germ that causes diarrhea. Chlorine dioxide does, if used correctly.
- People who are pregnant, have thyroid problems or are sensitive to iodine should avoid iodine-treated water, and no one should drink iodine-treated water for more than a few weeks.

Portable water filters

A portable water filter is a hand-held or pump device that strains germs out of water. CDC says portable filters do not remove viruses. To remove bacteria, a filter's pore size must be 0.3 micron or smaller (a micron is one-millionth of a meter). For parasites like Giardia and Cryptosporidium, it must be 1 micron or smaller. CDC says to add a chemical disinfectant, such as chlorine, chlorine dioxide or iodine, after filtering, since chemical disinfectants kill viruses and bacteria.

Method	Kills germs?	Notes
Boiling	Yes, best method	1 minute; 3 minutes above 6,500 feet
Unscented bleach	Viruses and bacteria; may not kill parasites	8 drops of 6% or 6 drops of 8.25% per gallon; wait 30 minutes
Chlorine dioxide tablets	Viruses and bacteria; also Cryptosporidium if used as directed	Follow the label
Iodine or chlorine tablets	Viruses and bacteria	Do not kill Cryptosporidium
Portable filter	Bacteria and parasites, by pore size	Does not remove viruses
Any of the above	No	Cannot fix water with fuel, toxic chemicals or radioactive material

Boil water notices and other water advisories

CDC explains that water utilities or government agencies issue drinking water advisories when tap water is, or could be, contaminated. Chapter 6 covers how to sign up for local alerts so you hear about them quickly. CDC describes three main kinds.

Boil water advisory

A boil water advisory tells you to boil your tap water before you use it. CDC's guidance during one:

- Use commercially bottled water or boiled water for drinking, and to prepare and cook food. Boil water for 1 minute (3 minutes above 6,500 feet), even if it went through a home filter.
- Brush your teeth with boiled or bottled water.
- CDC says you can use tap water and soap to wash your hands during a boil water advisory, but follow what your local officials say.
- When bathing, be careful not to swallow water. Consider sponge baths for babies and young children.
- Use disposable plates and cups if you can. CDC says a dishwasher is generally safe if it has a sanitizing cycle or a final rinse of at least 150 degrees F. To hand-wash dishes, CDC's method includes soaking them for at least one minute in 1 teaspoon of unscented bleach per gallon of warm water.
- Give pets bottled water or boiled water that has cooled.
- For babies, breastfeeding is best. If you use formula, use ready-to-use formula if possible.

Do not drink advisory

A do not drink advisory usually means there are harmful chemicals or toxins in the water. CDC says boiling that water will not make it safe. Use bottled water for drinking, cooking, brushing teeth, washing fruits and vegetables, mixing baby formula, making ice and giving water to pets. The advisory itself will say whether you can bathe, flush or wash dishes with tap water.

Do not use advisory

A do not use advisory is rare. It means don't drink or use tap water for any purpose while the advisory is in effect, because even touching or breathing it could be harmful. Use bottled water for everything.

Caution: During any of these advisories, CDC says not to drink or use water or ice from appliances hooked up to your water line, such as the water and ice dispensers on your refrigerator.

When the advisory is lifted, follow your water utility's instructions before you go back to normal use.

Well owners: after a flood

If your home gets its water from a private well, you are your own water utility. Floods can wash germs and chemicals into a well. CDC's advice after a disaster is that it is safest to drink bottled water until you are certain your well water is free of contaminants. If there was a lot of flooding near your well, or you think it may be contaminated, do not drink the water.

Here is what to do:

1. Use bottled water, or boil your well water (a rolling boil for 1 minute) before you use it, until testing shows it is safe.
2. Contact your local or state health department, or your agricultural extension agent, for advice on disinfecting your well. An extension agent is a local expert from your state's land-grant university who helps residents with farm, home and water questions.
3. Contact your local health department about water sampling and testing.

4. CDC says wells should be disinfected by a well or pump contractor, because of safety concerns.
5. After a well is disinfected, CDC says to wait at least 7 to 10 days before taking a water sample for bacteria testing.

Caution: Flooded well equipment can shock you. CDC says to turn off all electricity to the well area before clearing debris. Never climb down into a well pit: gases and vapors can build up there.

Staying clean when the water is off

Keeping clean is not just about comfort. Dirty hands and poor sanitation spread the germs that cause diarrhea and other illness, and getting sick during an emergency is the last thing you need.

Handwashing

CDC says to wash your hands with soap and water for at least 20 seconds, especially at the times you are most likely to spread germs. In my house that means before eating or fixing food, after using the toilet or changing a diaper, and after any cleanup.

If local officials or your doctor recommend extra caution, CDC says to wash with soap and water that has been boiled or disinfected. During a boil water advisory or a do not drink advisory, CDC says it may be safe to wash hands with tap water, so listen to your local officials.

If the tap is off, CDC suggests making a temporary handwashing station with a large water jug. Here's a simple way to do it: set a jug with a spout on the edge of a table, put a bucket underneath to catch the used water, and keep a bar of soap and paper towels next to it.

Hand sanitizer: helpful, with limits

If you don't have soap and water, CDC says to use a hand sanitizer that contains at least 60% alcohol. Hand sanitizer is a gel or liquid you rub on your hands to kill germs. CDC also notes its limits: sanitizers don't work as well when hands are visibly dirty or greasy, they don't get rid of all types of germs, and they might not remove harmful chemicals. Use soap and water whenever you can.

Bathing and brushing teeth

- Follow your local health and water officials on whether it's safe to bathe.
- Even when bathing is allowed, try not to swallow water or get it in your eyes.
- CDC says not to bathe in water that may be contaminated with sewage or toxic chemicals, including rivers, streams or lakes touched by floodwater, sewage or animal waste.
- Use only clean water to brush your teeth.

Caution: If you have an open wound or rash, stay out of floodwater. CDC says to wash wounds with soap and clean water, cover them with a waterproof bandage, and get medical care quickly if a wound becomes red, swollen or oozing. Chapter 8 covers first aid.

When the toilet won't flush

If the water or sewer isn't working, or officials tell you not to flush, you need another way to go. Ready.gov's basic kit includes moist towelettes, garbage bags and plastic ties for personal sanitation, which are the start of an emergency toilet.

The Washington State Department of Health gives two simple setups:

- Use your own toilet. Turn off the water valve to the toilet and flush out the water left in the bowl (it shouldn't refill). Then line the bowl, under the seat, with a plastic kitchen garbage bag inside a second kitchen garbage bag.
- Use a five-gallon bucket, lined the same way. You can set a toilet seat on top.

After each use, add kitty litter, peat moss or something similar that soaks up liquid. Store used bags away from kids, pets and wildlife, for example inside a garbage can in the garage, until they can go out with the trash. Follow any instructions your local officials give about disposal. Then wash your hands with soap and running water; wet wipes and hand sanitizer will do if you don't have running water.

> **Tip:** Put a toilet kit together now: a five-gallon bucket with a lid, a box of kitchen garbage bags, a bag of cat litter, toilet paper, hand sanitizer and a pair of disposable gloves. Store it all inside the bucket.

Quick checklist

- ☐ Store at least one gallon of water per person per day for three days, and build toward two weeks.
- ☐ Add extra water for anyone pregnant, nursing or sick, for pets, and for hot weather.
- ☐ Use food-grade containers, clean and sanitize them, and label each with the date.
- ☐ Keep water in a cool, dark place and replace water you bottled yourself every six months.
- ☐ Keep a dated bottle of unscented bleach and a medicine dropper for treating water.
- ☐ Learn where your water heater drain and main water shutoff valve are.
- ☐ Know the difference between boil water, do not drink and do not use advisories.
- ☐ If you have a well, know your health department's number for testing after a flood.
- ☐ Pack soap, hand sanitizer with at least 60% alcohol, and an emergency toilet kit.

Chapter 4: Food

After water, food is the next thing your household will miss when the stores close, the roads wash out, or the power stays off for a few days. The good news is that food is easier than most people think. You don't need special freeze-dried meals or a basement full of buckets. You need a few days of food your family already likes, that keeps on a shelf, and that you can eat without a working stove.

This chapter covers how much food to keep, what kinds to choose, how to store and rotate it, how to keep refrigerated food safe when the power goes out, what to throw away after a flood, and how to cook safely when the electricity is off. It also covers babies, special diets and pets. Chapter 3 covers water, and Chapter 10 covers power outages and generators in detail.

How much food do you need?

Ready.gov, the federal government's preparedness website run by the Federal Emergency Management Agency (FEMA), says to store "at least a several-day supply of non-perishable food." Non-perishable means food that stays safe at room temperature for a long time without a refrigerator, such as canned goods, dry cereal, peanut butter and crackers. FoodSafety.gov, a federal food safety site, says to keep at least a 3-day supply of food on hand.

You might ask, "Is three days really enough?" For a short storm, often yes. But after a big disaster, it can take longer for stores to restock and for roads to reopen. Older guidance from FEMA, the American Red Cross and the U.S. Department of Agriculture (USDA) suggests working toward a two-week supply, and says the easiest way to get there is to keep more of the basic foods you already keep on your shelves. The Centers for Disease Control and Prevention (CDC) gives the same advice for water: store a two-week supply if you can (Chapter 3). I think that is the right approach. Start with three days, then build toward two weeks a little at a time.

> **Tip:** Count meals, not cans. For each person, three days means about nine meals plus a few snacks. Write that number on a sticky note and keep it in your pantry.

What kind of food to keep

The best emergency food is food your family will actually eat. Ready.gov puts it simply: "Choose foods your family will eat." A shelf of canned beans nobody likes is not a food supply. It is a guilt pile.

Ready.gov also says to stock canned foods, dry mixes and other staples that do not need refrigeration, cooking, water or special preparation. That last part matters. During an emergency you may have no power to cook and no extra water to spare for boiling pasta or mixing soup.

Good choices for most households

Ready.gov suggests foods like these. Pick the ones your family eats now.

Food type	Examples	Why it works
Ready-to-eat canned meats	Tuna, chicken, ham	Protein with no cooking needed
Canned fruits and vegetables	Peaches, green beans, corn	Can be eaten cold from the can

Food type	Examples	Why it works
Protein or fruit bars	Granola bars, breakfast bars	Light, easy to pack
Dry cereal or granola	Boxed cereal, oats-based mixes	Filling, no cooking
Peanut butter	Jar of peanut butter	High in protein and energy
Dried fruit	Raisins, apricots	Keeps well, sweet treat
Canned juices	Single cans or bottles	Adds fluids and variety
Shelf-stable milk	Non-perishable pasteurized milk	No refrigerator until opened
High-energy foods	Crackers, nuts, trail mix	Quick calories
Comfort foods	Cookies, hard candy, instant coffee or tea	Helps morale on a hard day

The same older FEMA guidance warns against stocking a lot of salty foods, because they make you thirsty, and thirst uses up the water supply you worked to store.

Tip: Buy smaller cans and packages when you can. Once a can is open and the refrigerator is off, you will want to finish it at one meal.

Don't forget the can opener

Ready.gov reminds you to include a manual can opener and eating utensils. A cupboard full of cans and only an electric opener is a common mistake. Put a hand-turned can opener in the same bin as your food, and add a few paper plates, cups and plastic forks so you don't have to waste water on washing dishes.

Special diets and medical needs

Ready.gov says to remember any special dietary needs. If someone in your home has diabetes, food allergies, celiac disease, kidney disease or another condition that limits what they can eat, build their supply first. Talk with their doctor or a dietitian about what shelf-stable foods are safe for them. Read labels carefully when you buy emergency food, since many canned and packaged foods are high in salt or contain common allergens.

Babies and young children

If you have a baby, plan their food first. The Centers for Disease Control and Prevention (CDC) says that "Ready-to-feed infant formula is the safest option for formula feeding during an emergency." Ready-to-feed formula is liquid formula that comes ready to pour, with no mixing and no water needed. Ready.gov gives the same advice: use ready-to-feed formula, and if you must mix formula, use bottled water, or boiled water as a last resort.

CDC's emergency list for families with infants and young children includes items like these:

- Ready-to-feed formula in single-serving cans or bottles, plus bottles and nipples
- If you use powdered formula: bottled water for mixing, a clean food-grade container with a lid, and a liquid measuring cup
- For breastfeeding parents: disposable nursing pads, and if you pump, a manual pump in case the power is out, plus milk storage bags and a small cooler with ice packs
- Non-perishable baby food and snacks that fit your child's age
- Disposable cups, dishes, feeding spoons and bibs
- Safe drinking water, such as bottled water

CDC also says to check your emergency kit monthly to be sure you have enough formula to meet your baby's current needs for several days. Babies grow fast, so the amount and the type of food they need changes quickly. CDC warns that if you cannot clean bottles, pump parts and other reusable feeding items with safe water and soap, you should not use them. That is one more reason to keep disposable cups and ready-to-feed formula on hand.

Caution: If you mix formula, the Food and Drug Administration (FDA) says to use the exact amount of water the label says. Formula with too much water will not give your baby enough nutrition, and formula with too little water can cause dehydration. FDA also advises against making homemade formula. Never mix powdered formula with water that may be unsafe. If you are unsure, call your baby's doctor or your local health department.

Pets

Pets need food too. CDC's pet preparedness kit list calls for a 2-week supply of food for each animal, stored in waterproof containers, plus a 2-week supply of water for each animal. If your pet eats canned food, keep a can opener with it. Chapter 5 covers the rest of a pet kit.

Storing food the right way

FoodSafety.gov says the best storage temperature for emergency food is between 40 and 70 degrees F. In most homes that means an inside closet or a pantry shelf, not a hot garage or an attic. Ready.gov's kit page says to keep canned food in a cool, dry place, and to store boxed food in tightly closed plastic or metal containers. That keeps out bugs, mice and moisture.

Shelf life and rotation

Shelf life is how long a food stays good to eat in storage. Most packaged foods have a "best by" or "use by" date printed on them. Write the purchase date on the top of each can or box with a marker so you can see it at a glance.

The simplest way to keep your supply fresh is "first in, first out." When you bring new groceries home, put them at the back of the shelf and move the older items to the front. Then eat from the front. Your emergency food becomes part of your normal pantry, so nothing sits for years and goes bad.

Ready.gov's kit page says to replace expired items and to review your needs every year, updating your kit as your family changes. A good time to do this is when you check your other kits (see Chapter 5).

If you put up food at home by canning it, FoodSafety.gov says home-canned food usually needs to be thrown out after a year. Store-bought canned food generally lasts longer, but follow the date on the label.

Damaged cans and packages

Don't eat from cans that look wrong. Ready.gov warns never to eat foods from cans that are swollen, dented or corroded, even if the food looks fine, and never to eat any food that looks or smells abnormal, even if the can looks normal. FoodSafety.gov adds that you should throw out canned foods that are bulging, opened or damaged, and cans that spurt liquid or foam when you open them.

Caution: A bulging or leaking can is a warning sign. Throw it away without opening it or tasting it.

Keeping food safe when the power goes out

Most power outages are short, but even a few hours can spoil the food in your refrigerator. The rules below come from FoodSafety.gov and Ready.gov. Chapter 10 covers power outages in full.

Before the power goes out

- Keep an appliance thermometer in both the refrigerator and the freezer. An appliance thermometer is a small, inexpensive thermometer that sits on a shelf and shows the temperature inside. FoodSafety.gov says the freezer should be at or below 0 degrees F and the refrigerator at or below 40 degrees F.
- Freeze containers of water and gel packs ahead of time. They help keep food cold, and FoodSafety.gov notes the melted water can also be used for drinking.
- Have coolers ready. FoodSafety.gov says to have coolers on hand to keep refrigerated food cold if the power might be out for more than 4 hours.
- Group food together in the freezer. Packed items stay cold longer than items spread out.

During the outage

The most important rule: keep the doors closed. FoodSafety.gov says a refrigerator keeps food cold for about 4 hours if the door is kept closed. A full freezer holds its temperature for about 48 hours, or about 24 hours if it is half full, if you don't open the door.

Appliance	How long food stays cold (door closed)	Safe temperature
Refrigerator	About 4 hours	40 F or below
Full freezer	About 48 hours	0 F or below
Half-full freezer	About 24 hours	0 F or below

If the outage will last longer, move milk, meat and other perishables into a cooler packed with ice. Dry ice can also help. Dry ice is frozen carbon dioxide; it is much colder than regular ice. FoodSafety.gov says 50 pounds of dry ice should keep an 18-cubic-foot full freezer cold for two days. Ready.gov says to wear dry, heavy gloves when you handle it and to keep it from touching the food directly.

Caution: Dry ice can burn bare skin. Handle it only with heavy gloves, and keep it away from children and pets.

After the power comes back

Ready.gov explains that bacteria in food grow quickly at temperatures between 40 and 140 degrees F. That is why the 40-degree mark matters so much.

FoodSafety.gov says that if the power has been out longer than 4 hours, throw away refrigerated food like meat, poultry, fish, eggs and milk. More broadly, it says to throw out perishable food that has been above 40 degrees F for 2 hours or more.

For the freezer, check each item. FoodSafety.gov says thawed or partly thawed food can be safely refrozen if it still contains ice crystals or is at 40 degrees F or below. Ready.gov adds that thawed food usually can be eaten if it is still "refrigerator cold."

If your food...	Then...
Was in a closed refrigerator 4 hours or less	It should be safe; check it with a thermometer
Is refrigerated meat, poultry, fish, eggs or milk and the power was out more than 4 hours	Throw it out
Has been above 40 F for 2 hours or more (perishables)	Throw it out
Is frozen food that still has ice crystals or is at 40 F or below	It can be refrozen or cooked
Has an unusual smell, color or texture	Throw it out

Caution: Never taste food to decide if it is safe. FoodSafety.gov is clear on this. Food can smell and look normal and still make you sick.

The rule that covers everything else is the one federal food safety agencies keep repeating: "When in doubt, throw it out."

Food after a flood

Floodwater carries sewage, chemicals and germs. FoodSafety.gov says: "Do not eat any food that may have come into contact with flood or stormwater." Ready.gov says the same: throw away any food that has come into contact with contaminated floodwater.

FoodSafety.gov says to throw out these items if floodwater touched them:

- Food in packages that are not waterproof
- Food in cardboard containers, including juice, milk and baby formula boxes
- Food in containers with screw caps, snap lids or similar closures
- Home-canned foods, because they cannot be disinfected
- Any food with an unusual odor, color or texture
- Cans that are bulging, opened or damaged

Saving undamaged store-bought cans and pouches

Commercially canned food in cans or retort pouches (sealed foil pouches, like some tuna and rice packs) that are not damaged can often be saved. FoodSafety.gov gives these steps:

1. Remove the labels if you can, and note the expiration date.
2. Brush off any dirt or silt.
3. Wash the cans or pouches with hot, soapy water.
4. Rinse them with clean, safe water.
5. Sanitize them one of two ways: soak them for 15 minutes in a solution of 1 cup of unscented household bleach in 5 gallons of water, or put them in a pot of water, bring it to a boil, and keep it boiling for 2 minutes.
6. Re-label the cans or pouches with a marker, including the expiration date.

7. Use the food as soon as you can.

> **Caution:** CDC says never to mix bleach with ammonia or any other cleaner, and never to use bleach in a closed space. Open windows and doors first.

Chapter 13 covers flood cleanup, and Chapter 3 covers water safety after a flood.

Eating and cooking without power

You may not need to cook at all

Ready.gov notes that commercially canned food may be eaten out of the can without warming. That is why no-cook foods are the backbone of your supply. Cold canned stew is not a gourmet meal, but it is safe, filling and ready.

If you do want to warm a can, Ready.gov says to remove the label, wash and disinfect the can, and open it before heating. Never heat a sealed can.

Safe ways to cook

Ready.gov says candle warmers, chafing dishes and fondue pots can be used for emergency cooking, and that charcoal grills and camp stoves are for outdoor use only.

> **Caution:** Never use a generator, grill, camp stove or any other gasoline-, propane- or charcoal-burning device inside your home, garage or carport. CDC warns these give off carbon monoxide, a gas you cannot see or smell that can kill. Keep them away from doors, windows and vents. Don't use a gas oven to heat your home, and don't grill inside.

Carbon monoxide, often shortened to CO, is a poison gas produced when fuel burns. CDC says more than 400 people in the U.S. die each year from carbon monoxide poisoning that isn't linked to a fire. I wouldn't count on an open window or garage door to make it safe, either: take the grill or stove outside. Chapter 9 covers carbon monoxide alarms, and Chapter 10 covers generator safety.

Keep cooking simple

Whatever you cook on, keep it short and simple. Stay in the kitchen while anything is on the burner, and keep a fire extinguisher handy (Chapter 9). If you have a gas stove, read the maker's instructions now so you know whether it works when the power is off.

Building your food supply on a budget

You don't have to buy everything at once. Here is a simple plan that fits a normal grocery budget.

1. Look in your pantry first. Many households already have two or three days of shelf-stable food without trying.
2. Each time you shop, buy one or two extra items from the list in this chapter. A jar of peanut butter one week, a few cans of fruit the next.
3. Buy what is on sale. Canned goods often go on sale in bulk.

4. Put new items at the back and eat from the front.
5. After a month or two you will have three days. Keep going and you will reach two weeks without ever feeling the pinch.

> **Tip:** Make a simple list on the inside of your pantry door: what you have, how many, and the earliest date. Update it when you use something up.

You might ask, "What if we have to leave home?" Your go-bag should hold a smaller supply of light, easy food. Chapter 5 covers go-bags, car kits and work kits.

A quick word on the two-hour rule

In everyday life we leave food out all the time, so the two-hour rule can feel fussy. During an emergency it matters even more, because you can't run to the store or the doctor if someone gets sick. Ready.gov says to throw away any food that has been at room temperature for two hours or more. FoodSafety.gov adds that the limit drops to 1 hour when the temperature is above 90 degrees F. In a summer outage, that clock runs fast.

Quick checklist

- ☐ Store at least three days of non-perishable food for each person, then build toward two weeks.
- ☐ Choose foods your family already eats, including special diets.
- ☐ Put a manual can opener, paper plates, cups and utensils with your food.
- ☐ Keep ready-to-feed formula and baby supplies if you have an infant.
- ☐ Store two weeks of pet food in a waterproof container.
- ☐ Keep appliance thermometers in your refrigerator and freezer.
- ☐ Freeze a few containers of water and keep a cooler handy.
- ☐ Rotate food: first in, first out. Check dates once a year.
- ☐ Throw out any food that touched floodwater, and never taste food to check it.
- ☐ Never use a grill, camp stove or generator indoors or in a garage.

Chapter 5: Emergency Kits: Home, Go-Bag, Car, and Work

An emergency kit is just a collection of supplies you put together ahead of time so you don't have to scramble when something goes wrong. That's it. It doesn't need to be fancy, and it doesn't need to come from a store that sells "survival" gear. Most of what goes into a good kit is already somewhere in your home.

This chapter walks through four kits: a home kit for staying put, a go-bag for leaving in a hurry, a car kit, and a small kit for work. It also covers medications, babies, older adults, people with disabilities, and pets, plus how to store and check your kits so they're ready when you need them. Chapter 3 covers water and Chapter 4 covers food in detail, so here we'll focus on how those fit into your kits.

Starting in the field in 1987, I learned that gear sitting in a garage does you no good when you are stuck far from home. Keep water, warm layers, a flashlight and basic tools in your vehicle. You do not need expensive gear, just the basics where you can reach them.

Why kits matter

Ready.gov, the federal government's preparedness website run by the Federal Emergency Management Agency (FEMA), recommends a basic disaster supplies kit for every household. Here's why I agree. After a storm or an earthquake, the power may be off, the stores may be closed, and emergency crews may be busy with the worst-hit areas. A kit means you can take care of yourself and your family, and maybe help a neighbor too.

You might ask, "Where do I even start?" Start with the home kit. It's the biggest and the most useful. Then pull a smaller go-bag out of it, and add the car and work kits over time.

The home kit

Your home kit is for sheltering in place, which means staying in your home during or after an emergency. Ready.gov's basic kit list is the core. It suggests storing items in airtight plastic bags and keeping the whole kit in one or two easy-to-carry containers, such as plastic bins or a duffel bag.

Ready.gov basic kit

Item	Why you need it	Notes
Water	Drinking and sanitation	About one gallon per person per day for several days (Chapter 3)
Food	Several days of meals	Non-perishable food (Chapter 4)
Battery-powered or hand-crank radio	News when power and internet are out	Ready.gov also lists a NOAA Weather Radio with tone alert (Chapter 6)
Flashlight	Light in an outage	Use instead of candles (Chapter 9)
First aid kit	Treat small injuries	See Chapter 8
Extra batteries	For radio and flashlights	Match the sizes you need
Whistle	Signal for help	Carries farther than your voice
Dust mask	Filter contaminated air	For dust and debris
Plastic sheeting, scissors, duct tape	Shelter in place	See Chapter 7

Item	Why you need it	Notes
Moist towelettes, garbage bags, plastic ties	Personal sanitation	See Chapter 3
Wrench or pliers	Turn off utilities	See Chapter 9
Manual can opener	Open canned food	Don't rely on an electric one
Local maps	Find routes if phones fail	Paper maps
Cell phone with chargers and a backup battery	Stay in touch	Keep a battery pack charged

NOAA stands for the National Oceanic and Atmospheric Administration, the federal agency that runs the National Weather Service. A NOAA Weather Radio is a special radio that picks up weather alerts broadcast by the National Weather Service. A "tone alert" model sounds an alarm when a warning is issued, even if the radio is otherwise quiet. Chapter 6 explains these radios in more detail.

Ready.gov additional items

Ready.gov also lists extra items to think about, based on your household's needs. You don't need all of them. Pick the ones that fit your family.

- Soap, hand sanitizer and disinfecting wipes
- Prescription medications, plus over-the-counter medicines such as pain relievers, anti-diarrhea medicine, antacids and laxatives
- Prescription eyeglasses and contact lens solution
- Infant formula, bottles, diapers, wipes and diaper rash cream
- Pet food and extra water for your pet
- Cash or traveler's checks
- Copies of important family documents, saved electronically or kept in a waterproof container
- A sleeping bag or warm blanket for each person
- A complete change of clothing suited to your climate, and sturdy shoes
- A fire extinguisher
- Matches in a waterproof container
- Feminine supplies and personal hygiene items
- Mess kits, paper cups, plates, paper towels and plastic utensils
- Paper and pencil
- Books, games, puzzles or other activities for children

Cash: why small bills help

When the power is out, card readers and ATMs may not work. Ready.gov lists cash in its additional supplies. I suggest keeping it in small bills, because a store running on a cash box may not be able to make change. Keep it in a sealed envelope in your kit, and don't count it as spending money.

Important documents

Chapter 2 covers which papers to copy and how to protect them. The short version: keep copies in a waterproof container in your kit and secure electronic copies you can reach from your phone.

The go-bag

A go-bag, sometimes called a grab-and-go bag, is a smaller kit you can carry out the door in a hurry, such as during an evacuation. An evacuation is when you leave your home to go somewhere safer, often because officials tell you to. Ready.gov says to keep your home kit in a designated place and have it ready in case you have to leave home quickly.

I'd give each person in the household their own go-bag, sized to what they can carry. A backpack works well because it leaves your hands free. Kids can carry a small one with a few things of their own.

What goes in a go-bag

Item	Suggestion
Water	A few bottles per person; you can find more water at a shelter or along the way
Food	Light, no-cook snacks and bars
Medications	A supply of prescription medicines, with a list of names and doses
Flashlight and batteries	One per bag
Phone charger and backup battery	Charged ahead of time
First aid basics	Bandages, pain reliever, any personal items
Copies of documents	In a waterproof bag
Cash	Small bills
Clothing	A change of clothes, sturdy shoes, a rain jacket
Personal hygiene items	Toothbrush, toothpaste, soap, feminine supplies
Glasses and contact lens supplies	Even if you usually wear contacts
Whistle and dust mask	Light and small
Comfort items	A small game, book or stuffed animal for kids
Contact list	Written on paper (see Chapter 2)

Tip: Keep your go-bag near the door you use most, or in a hall closet. If you have to leave in a few minutes, you won't have time to dig through the garage.

Chapter 7 covers evacuation, including what to do with pets and where to go.

The car kit

Breakdowns, crashes and road closures happen to everyone. A car kit helps you stay safe and comfortable while you wait for help, and it gets you back on the road faster.

Ready.gov car kit

Ready.gov lists these items for an emergency kit in your car:

- Jumper cables
- Flares or a reflective triangle
- Ice scraper
- Car cell phone charger
- Blanket

- Map
- Cat litter or sand, for better tire traction

Extra items for winter

If you live where it snows or gets very cold, the National Weather Service (NWS) suggests a bigger winter car kit. Its list includes the items below.

Item	NWS note
Jumper cables	Flares or a reflective triangle are good extras
Flashlights	Replace the batteries before winter starts and pack extras
First aid kit	Carry essential medications with you in a purse or bag
Baby gear	Diapers and any special formula or food
Medical supplies	For any special medical needs
Food	Non-perishable food such as canned food and a can opener, dry cereal, nuts and energy bars
Water	At least 1 gallon per person a day for at least 3 days
Basic toolkit	Pliers, wrench, screwdriver
Pet supplies	Food and water
Radio	Battery-powered or hand-crank
Cat litter or sand	For better tire traction
Shovel	To dig out snow
Ice scraper	Keep one in the car even if you usually park in a garage
Warm clothes	Gloves, hat, sturdy boots, jacket and an extra change of cold-weather clothes
Warmers	For body, hands and feet
Blankets or sleeping bags	In case you get stranded
Charged cell phone	Keep a spare charger in the car

Three gallons per person is a lot of water for a small car. Carry as much as you reasonably can, and top it up before a long winter drive.

Keep the tank from running low

Ready.gov says to keep your gas tank full in case of evacuation or power outages, and notes a full tank also helps keep the fuel line from freezing. The NWS says to keep at least half a tank of gas during extreme cold so you can stay warm if you get stranded. If you drive an electric vehicle, I'd apply the same idea and keep it well charged when a storm is coming.

Have the car checked

Ready.gov suggests having a mechanic check these before an emergency, especially before winter: antifreeze levels, battery and ignition, brakes, exhaust system, fuel and air filters, heater and defroster, lights and flashing hazard lights, oil, thermostat, and windshield wipers and washer fluid.

Caution: Ready.gov says do not drive through flooded areas. Six inches of water can make a car lose control or stall, and a foot of water will float many cars. If a power line falls on your car, stay inside until a trained person removes the wire.

Chapter 25 covers what to do if you get stranded in your car.

The work kit

Ready.gov says to be prepared to shelter at work for at least 24 hours, and to keep your work kit in a "grab and go" case. Your workplace may have its own plan, so ask about it. Then keep a small personal kit of your own. I'd start with food, water, any daily medicines and a pair of comfortable walking shoes.

What to keep at work

- ☐ Water and a few no-cook snacks
- ☐ A few days of any daily medications
- ☐ Comfortable walking shoes, in case you have to walk home
- ☐ A phone charger and backup battery
- ☐ A small flashlight
- ☐ A copy of your family contact list
- ☐ A light jacket or sweater
- ☐ Any personal hygiene items you'd want

If you work far from home, think about how you'd get home if roads or transit shut down. Chapter 2 covers commuters in your family plan.

Medications and medical needs

For many households this is the most important part of the kit. Ready.gov lists prescription medications in its additional supplies, and notes that about half of all Americans take a prescription medicine every day. An emergency can make it hard to refill a prescription or to find an open pharmacy.

- Ask your doctor or pharmacist how you can keep an emergency supply of your prescriptions, and ask well before you need it.
- Keep a written list of every medicine, its dose and the prescribing doctor. Put a copy in each kit.
- Some medicines must stay cold. Ask your pharmacist what to do if the power goes out. Chapter 8 covers medications during outages.
- If you use medical equipment that needs power, such as oxygen or a breathing machine, talk with your doctor and your equipment supplier about backup power before you need it. Chapter 10 covers power outages.

Glasses, hearing aids and other daily aids

Ready.gov lists prescription eyeglasses and contact lens solution. Keep an old pair of glasses in your kit. If you use hearing aids, pack extra batteries or a charger. If you use a cane, walker or wheelchair, think about how you'd get around if you had to leave quickly, and keep any spare parts or a patch kit with your gear.

Kits for babies and young children

CDC, the Centers for Disease Control and Prevention, has an emergency list for families with infants and young children. Key items include:

- Ready-to-feed infant formula in single-serving cans or bottles, which CDC calls the safest choice for formula feeding during an emergency
- Bottles and nipples
- Non-perishable baby food and snacks for your child's age
- Disposable cups, dishes, feeding spoons and bibs
- Safe drinking water, such as bottled water
- Disposable nursing pads, and a manual breast pump if you pump

Ready.gov adds diapers, wipes and diaper rash cream, and books, games or puzzles for kids. A favorite small toy or blanket can make a scary night much easier. CDC says to check your kit monthly to make sure you have enough formula for your baby's current needs for several days. Chapter 4 covers infant feeding in more detail.

Kits for pets

CDC's pet disaster kit list is a good guide. Ask your veterinarian to help you put it together.

Item	CDC guidance
Food	2-week supply for each animal, in waterproof containers
Water	2-week supply for each animal
Medicines	2-week supply of any medications; 1-month supply of flea, tick and heartworm preventive
Records	Photocopies of veterinary records, including rabies certificate and vaccinations
First aid	A pet first aid book and first aid kit
Leash and ID	Leash, collar with ID, and harness; microchip number and the microchip company's contact information
Carrier	Right-sized carrier with bedding, a blanket or a towel
Sanitation	Litter and litter box for cats; paper towels, plastic bags and disinfectant for accidents
Photos	Recent photos of each pet, in case you get separated
Instructions	Feeding and medication instructions, and your contact information
Comfort	Toys

Chapter 2 covers planning for pets and service animals, and Chapter 7 covers evacuating with pets.

Older adults and people with disabilities

Ready.gov's kit guidance says to consider what unique needs your family might have, such as supplies for pets or seniors. Ready.gov's page for older adults says to include items that meet your individual needs, such as medicines, medical supplies, batteries and chargers, and to plan how you will have your assistive devices with you during an evacuation. It also suggests building a support network of family, friends and others who can help, and making sure at least one person has an extra key and knows where your supplies are kept. The best kit is built around the person who will use it. Sit down with the person, or with the family member who helps them, and walk through a normal day. What do they use from the time they wake up until they go to bed? Anything on that list that runs on power, needs a refill, or would be hard to replace belongs in the plan.

Some questions to ask:

- Which medicines, supplies and daily aids would be a problem to go without for a few days?

- Is there a backup for anything that needs electricity or batteries?
- Can the go-bag be carried by this person, or does someone else need to carry it? A small rolling bag may work better than a backpack.
- Are there written instructions for any equipment, so a helper could use it?
- Who in the neighborhood will check on this person, and do they have a key?

Write the answers down and keep a copy in the kit. Chapter 2 covers planning for people with disabilities and access needs in more detail.

Let the kids help

Children are less scared when they know the plan and have a job. Let each child help pack their own go-bag. Have them pick one comfort item, a snack they like and a small game or book. Tape a card inside with your family's names and phone numbers, and practice what to do with it. Then let them help on "kit day" when you check the supplies. A child who helped pack the bag knows where the flashlight is.

Storing and checking your kits

A kit does no good if the batteries are dead, the water is old and the medicine expired last year. Ready.gov's tips for keeping your kit ready:

- Keep canned food in a cool, dry place.
- Store boxed food in tightly closed plastic or metal containers.
- Replace expired items as needed.
- Rethink your needs every year and update your kit as your family's needs change.

Ready.gov also says to replace water you bottled yourself every six months (Chapter 3). I'd use that as a reminder to check the whole kit twice a year: swap the water, check expiration dates on food and medicine, test flashlights and radios, and update clothes for growing kids and the coming season.

> **Tip:** Pick two dates you'll remember, six months apart, and put them on your calendar as "kit day." Make it a family job, and let the kids eat the snacks that are about to expire.

Where to keep kits

- Home kit: a place all family members know, such as a hall closet or a spot by the back door.
- Go-bags: near an exit, or in a closet by the door.
- Car kit: in the trunk or cargo area, in a bin so items don't roll around.
- Work kit: at your desk, in a locker or in a drawer.

Keep kits away from extreme heat when you can. A hot attic or a car in summer can shorten the life of food, water, batteries and medicine.

Building kits on a budget

You don't need to buy everything this weekend. Here's how I'd do it on a normal budget:

1. Shop your own home first. Flashlights, blankets, a first aid kit, old backpacks and spare phone chargers are already in most homes.

2. Gather it all in one bin so you can see what you have and what's missing.
3. Add one or two items each payday or shopping trip, starting with water, food and medications.
4. Buy batteries and water on sale, and rotate them into everyday use.
5. Build the go-bags next, then the car kit, then the work kit.

What not to buy

Skip gadgets you don't know how to use. A multi-tool with 30 functions, a fancy water filter you've never tried, or a radio with a confusing menu will frustrate you in the dark. Buy simple, sturdy items, then practice with them once at home. If you buy a hand-crank radio, crank it and tune in a station before you put it away. If you buy a camp stove, learn to use it outdoors on a calm day, not during a storm.

Quick checklist

- ☐ Put together a home kit with water, food, a radio, flashlights, batteries and a first aid kit.
- ☐ Add the Ready.gov extras your family needs, including medications and glasses.
- ☐ Pack a go-bag for each person and keep it near a door.
- ☐ Put an emergency kit in each car, with winter items if you live where it gets cold.
- ☐ Keep a small kit at work, including walking shoes.
- ☐ Pack baby supplies, including ready-to-feed formula, if you have an infant.
- ☐ Pack a pet kit with two weeks of food, water and medicines.
- ☐ Keep some cash in small bills and copies of important documents.
- ☐ Check every kit twice a year and replace stored water every six months.

Chapter 6: Alerts and Staying in Touch

A warning only helps if it reaches you in time. A lot of trouble in an emergency starts with someone who didn't hear the warning, heard it and didn't understand it, or couldn't reach their family afterward. This chapter fixes all three, and most of it costs nothing.

We'll cover how official alerts reach you (your phone, your radio and TV, and a weather radio), what the words "watch" and "warning" really mean, how to sign up for your local alerts, and how to keep in touch with your people when the phone lines are jammed or the power is out. Chapter 2 covers the family plan itself. This chapter is about the tools that carry the message.

How official alerts reach you

Think of alerts as several roads leading to the same house. If one road is blocked, another gets through. Aim for at least two or three ways of hearing a warning, including one that can wake you up at night and one that works without house power.

Here are the main ways warnings reach people in the United States:

System	How it reaches you	Do you sign up?	Works in a power outage?
Wireless Emergency Alerts (WEA)	Pops up on your cell phone like a text, with a special sound and vibration	No, it comes automatically on phones that can receive it	Yes, while your phone is charged and the cell network is up
Emergency Alert System (EAS)	Warnings sent over TV and radio stations, cable and satellite	No	Only on a battery or car radio, or a TV with backup power
NOAA Weather Radio	A special radio that receives National Weather Service broadcasts and can sound an alarm	No, but you need a receiver and should set it up	Yes, if the radio has batteries
Local alert systems	Texts, calls, emails or app messages from your city, county or state	Yes, you must sign up	Texts and calls work if your phone works

Wireless Emergency Alerts on your phone

Wireless Emergency Alerts (WEA) are short emergency messages sent to cell phones in an affected area. The Federal Communications Commission (FCC), the federal agency that oversees phone and broadcast services, says the alerts look like text messages on your phone. They come with their own attention signal and vibration, which also helps people with hearing or vision disabilities notice them.

You might ask, "Do I need to sign up for these?" No. The FCC says you don't need to sign up, and the alerts are free. Authorized public safety officials send them through a federal alerting system run by the Federal Emergency Management Agency (FEMA). Wireless companies then push the message from cell towers to phones in the area. The FCC notes that wireless companies take part voluntarily, so it's worth asking your carrier whether your phone and plan receive these alerts.

The FCC describes these kinds of WEA messages:

- Alerts issued by the President of the United States
- Alerts about imminent threats to safety or life, such as extreme weather in your area
- AMBER Alerts about missing children
- Public safety messages with recommendations for saving lives and property

Your phone may let you turn off some types of WEA messages, but the FCC says you can't block alerts from the President. My advice: leave every type switched on. An alert that wakes you at 2 a.m. for a flash flood warning is doing exactly what it's supposed to do.

One more setting is worth knowing. The FCC says test messages from state and local officials are turned off by default, and you have to opt in if you want to see them. You don't need them, but if your county announces a test and you want to be sure your phone works, that's the setting to look for.

WEA is aimed at an area, not at a person. The FCC says the system does not track the location of anyone who receives an alert. The FCC also says alerts reach phones in the alert area even if they're roaming or visiting from another state, which is handy when you're driving through a county you don't know.

Tip: Check your phone's emergency alert settings today. On most phones they're under Settings, then Notifications or Safety. Make sure the alerts are switched on. Do the same on your kids' and parents' phones.

Caution: If you turn off your phone's sound or vibration, you may not hear or feel an alert. The FCC warns about this. At night, keep the phone near your bed, or use a weather radio as your night-time alarm.

The Emergency Alert System on radio and TV

The Emergency Alert System (EAS) is the older partner of WEA. It sends warnings out over TV and radio broadcasters, cable TV systems, and satellite radio and TV providers. The President can use it in a national emergency, the National Weather Service (NWS) uses it for local and statewide weather warnings, and state and local officials can use it too. The FCC calls WEA and EAS the two main parts of the national public warning system, which FEMA, the FCC and the NWS maintain together.

For your household, the takeaway is simple: a battery-powered or hand-crank radio, or your car radio, can still bring you warnings during a power outage. Find out which local AM or FM station carries emergency news where you live, and write it on the card in your kit. Your county emergency management office can tell you.

NOAA Weather Radio

NOAA Weather Radio All Hazards is a network of radio stations run by the National Weather Service, part of the National Oceanic and Atmospheric Administration (NOAA). It broadcasts official warnings, watches, forecasts and other hazard information 24 hours a day. The NWS says the network has more than 1,000 transmitters covering all 50 states.

"All Hazards" means it isn't only about weather. The NWS says it can also carry non-weather emergencies, such as chemical releases or AMBER alerts, but only when state or local officials ask for them to be broadcast.

You need a special receiver to hear it. An ordinary AM/FM radio won't pick it up. The broadcasts use seven frequencies in the very high frequency (VHF) public service band, and a good receiver can tune all of them:

Frequencies (MHz)
162.400
162.425
162.450
162.475
162.500
162.525
162.550

Why bother, when you have a phone? Because a weather radio with an alarm stays quiet until a warning is issued, then sounds off, even if your phone is on silent, dead or out of signal. For tornadoes and flash floods at night, that matters a great deal.

What the NWS says to look for in a receiver:

- A warning alarm tone. The NWS calls this the most desirable feature. The radio stays silent until it detects a warning.
- SAME, short for Specific Area Message Encoding, so the radio only alarms for the counties you choose (more below)
- The ability to run on batteries when the power is out
- The ability to tune all seven frequencies

If someone in your home is deaf or hard of hearing, or has low vision, the NWS notes that a weather radio can be linked to strobe lights or bed shakers. Ask before you buy whether a model supports those accessories.

Setting up SAME

With SAME, you program a code for your county into the radio. When a warning goes out, the radio only sounds its alarm if your county is included. Without it, you'd hear alarms for places you don't live, and sooner or later you'd unplug the radio out of frustration.

Most newer SAME radios let you enter several codes. That's useful if you live in one county and work in the next, or if a storm usually reaches a neighboring county before yours.

To find your codes, you can call the NWS toll-free line at 1-888-697-7263 (1-888-NWR-SAME), which gives codes for any area of the country by phone, or look them up on the NWS weather radio pages at weather.gov/nwr.

A few setup tips from the NWS:

- Range is limited. A full-power transmitter typically reaches about 40 miles over level ground. Hills and buildings shorten that.
- If reception is weak, try the radio near a window facing the transmitter, on an upper floor, and away from other electronics. Moving it just a few feet can help.
- Each NWS office runs a weekly test of its transmitters, so you can confirm your radio is working. Your local NWS office website gives the test day and time.

Tip: Set up the radio the day you buy it, enter your county code, and put in fresh batteries. A weather radio still in the box in the closet is just an expensive paperweight.

Sign up for your local alerts

Federal alerts cover the big warnings. Your city, county or state may send many more: boil water notices, road closures, evacuation orders, shelter openings, wildfire updates and where to find help. Most of these local systems only reach you if you sign up.

Here's how to find yours:

1. Search the web for your county name plus "emergency alerts" or "emergency management". Make sure the page you land on is an official government site, often one ending in .gov or linked from your county's main website.
2. Sign up with your cell phone number for texts, and add an email address or a second number as a backup.
3. Add your home address, your work address, and your children's school or daycare if the system allows more than one location.
4. Help older parents or relatives sign up, with their permission.
5. Check whether your power, water and gas companies offer outage alerts, and sign up for those as well.

Do this for the places where you spend your time, not only where you sleep. If you work one county over, sign up there too.

Watches, warnings and advisories

These words get mixed up all the time, and the difference matters. The National Weather Service uses them in a set way:

Term	What the NWS means	What you do
Outlook	A significant weather event is possible, up to about 7 days ahead	Keep an eye on the forecast. Check your supplies.
Watch	Conditions are favorable for the hazard in and near the watch area. Issued up to about 72 hours ahead.	Get ready. Review your plan, charge your phone, know where you'll go.
Advisory	The weather will cause nuisance conditions, less serious than a warning	Take care. Adjust travel and outdoor plans.
Warning	A significant weather event will pose a risk to life and property	Act now. Follow your plan and official instructions.

An easy way to remember it: a watch means "watch out, this could happen." A warning means "this is a real threat to life and property, so take action."

You might ask, "If I'm only under a watch, do I need to do anything?" Yes, a little. A watch is your window to get ready while it's still calm: gas up the car, charge everything, bring in the patio furniture, and decide where you'd shelter. When the warning comes, there's no time left for errands.

The scenario chapters (11 to 25) explain the alerts for each hazard, such as hurricane, tornado, flood, winter and heat alerts. Some of those names have changed in recent years, and each chapter uses the current names.

When the phone networks are jammed

After a big event, everyone grabs a phone at once. Networks get overloaded and calls fail. The FCC's advice for this is simple:

- Limit non-emergency calls, and keep the calls you do make short.
- Send a text instead of calling. The FCC says that in many cases a text will go through when a call won't.
- If a call fails, wait about 10 seconds before you redial, to give the network a moment.
- If one way doesn't work, try another: text, email, or a landline if you have one.
- Keep emergency numbers stored in your phone.
- If you're driving, try to make calls only while the car is stopped.

Tip: Texting also saves battery. A short text like "We're OK, at home, power out, will text again at 6" gives your family what they need and saves both your battery and theirs.

Calling or texting 911

Always call 911 if you can. The FCC says a voice call is still the best way to reach 911, because a call gives the 911 center more to work with.

Text-to-911 exists, but the FCC says it is only available in certain locations. If you text 911 where it isn't available, your carrier is required to send back an automatic "bounce-back" message telling you to contact emergency services another way. That message is there so you don't sit and wait for help that isn't coming.

Texting 911 can matter when it isn't safe to speak, or for someone who is deaf, hard of hearing or has a speech disability. Where text isn't offered, the FCC points people to a TTY (text telephone) or a telecommunications relay service.

Caution: Never assume a text to 911 went through. If you get a bounce-back message or no reply, call if you possibly can, or find another way to get help.

The out-of-area contact

Chapter 2 walks through choosing an out-of-area contact: a relative or friend who lives far enough away that the same emergency won't hit them. The FCC recommends this too, along with a plan for how your family will reconnect if you get separated.

Here's why it works. Local lines are often jammed, but a long-distance call or text may still connect. Everyone in your family checks in with the same person, and that person passes the news along. It's much easier than six people trying to reach each other.

Write that person's number on paper, too. You might ask, "Why paper, when it's in my phone?" Simple: your phone might be dead, lost or broken, and most of us couldn't recite our own sister's number if our life depended on it.

Keep your phone charged

Your phone is your alert receiver, flashlight, map and lifeline. Treat its battery like any other supply you manage.

The FCC recommends keeping charged batteries and a car charger on hand as backup power for your phone. Here are the common options:

Power source	Good for	Things to know
Car charger	Charging while you drive or sit in a parked car outdoors	Never run the car in an attached garage (see the caution below).
Power bank (portable battery pack)	A few phone charges with no outlet	Keep it charged and top it off every few months.
Spare batteries for radios and flashlights	Keeping other gear going	Store them with your kit and check the dates.
Hand-crank or solar radio with a phone charging port	A small emergency charge	Slow, but it needs no outlet at all.
Portable power station or generator	Longer outages	See Chapter 10, especially for carbon monoxide safety.

Ways to stretch your phone battery when the power is out:

- Turn down the screen brightness.
- Close apps you aren't using.
- Turn on low power or battery saver mode.
- Text instead of calling, and keep scrolling to a minimum.
- If you have no signal at all, your phone burns battery hunting for one. Turning it off and checking at set times can help.

Caution: Never run your car or truck inside a garage that is attached to your home, even with the garage door open. The Centers for Disease Control and Prevention (CDC) warns that car exhaust contains carbon monoxide, a gas you can't see or smell that can kill. Charge your phone in the car only when the car is outside in open air.

Landlines and home phone backup

If you still have a landline, it can be a useful backup. The FCC points out that cordless phones usually stop working in a power outage, and suggests keeping at least one phone that doesn't need electricity to work, such as a simple corded phone.

Many home phone services today run over internet or cable equipment rather than old copper lines. If you depend on a home phone, ask your provider whether it keeps working in a power outage, whether the equipment has a backup battery, and how long that battery lasts.

If you have to leave home, the FCC suggests forwarding your home number to your cell phone so calls still reach you.

Two-way radios

When cell service is down, a pair of two-way radios can keep family members in touch over short distances: a neighbor checking on you across the street, or a parent keeping track of kids at a campground. You'll hear about three main kinds.

Type	License?	What to know
Family Radio Service (FRS)	No individual license needed; the FCC says FRS is "licensed by rule"	Short-distance radios that anyone may use, regardless of age. Range on some channels is less than half a mile.
General Mobile Radio Service (GMRS)	Yes, an FCC license is required	You must be 18 or older to apply. The FCC lists a $35 application fee. A license lasts ten years, and any family member of the license holder, regardless of age, can use it.
Amateur (ham) radio	Yes, and you must pass an exam first	Exams are given by teams of volunteer examiners, who may charge a fee to cover their costs. The FCC also lists a $35 fee for a new license. Most beginners start with the Technician class license.

A few honest points about two-way radios:

- The FCC says FRS channels are shared with GMRS, so you may hear other people on your channel. Agree on a channel with your family ahead of time and write it on a card in your kit.
- Range depends a great deal on hills, buildings and trees. Test your radios around your own neighborhood before you count on them.
- Radios only help if both people have one, it's charged, and it's turned on. Keep spare batteries with them.
- Ham radio takes study and practice. If it interests you, a local amateur radio club is a good place to start.

Social media, news and rumors

In a disaster, social media can be fast and useful. It can also be wrong. Rumors spread quickly, and some people post old photos, false shelter locations or outright scams.

My rules:

- Follow the official accounts of your county emergency management office, your local NWS office, your police and fire departments, and your utilities. Do it now, before you need them.
- Trust official sources first. If a post says "evacuate now" but your local officials aren't saying that, check before you act.
- Don't share something unless you know it came from an official source. Passing along a rumor can send people the wrong way.
- Be wary of anyone asking for money or personal information to "sign you up" for help. Chapter 26 covers disaster scams.

Social media also helps you tell people you're safe. One short post or message can reach many friends at once, which means fewer calls to you and less load on a busy network.

Special notes

People who are deaf, hard of hearing, blind or low vision

- WEA alerts use a special sound and vibration meant to help people with hearing or vision disabilities notice them.
- The FCC recommends NOAA Weather Radio for people who are hearing impaired, and the NWS notes weather radios can be connected to strobe lights and bed shakers.
- Text-to-911 may be available where you live. Where it isn't, use a TTY or a relay service.
- The FCC suggests people with disabilities register with their local police department ahead of an emergency.

Older adults

If you help an older parent or neighbor, check that their phone gets alerts with the sound on, and help them sign up for local alerts. The FCC says most medical alert systems need a working phone line, and suggests having a backup, such as a cell phone.

Kids

Teach children how and when to call 911. Make sure they know your out-of-area contact's number or carry it on a card in their backpack. Older kids with phones should know that a text often gets through when a call won't.

Quick checklist

- ☐ Wireless Emergency Alerts switched on in every family member's phone
- ☐ Signed up for county or city alerts (home, work and school addresses)
- ☐ Signed up for utility outage alerts
- ☐ Weather radio with batteries, county code entered, and tested
- ☐ Out-of-area contact chosen and written on paper in each kit and wallet
- ☐ Car charger and a charged power bank for each phone
- ☐ Official local accounts followed (emergency management, NWS office, utilities)
- ☐ Everyone knows: a watch means get ready, a warning means act now
- ☐ Everyone knows: text first, keep calls short, call 911 if you can

Chapter 7: Shelter in Place or Evacuate

When something dangerous is coming, you have two basic choices: stay where you are and make it safer, or leave. Officials call these "shelter in place" and "evacuate." Picking the right one, and doing it quickly, protects more people than almost anything else in this book.

This chapter explains how to decide, how to get ready to leave on short notice, where to go, and how to make your home safer when staying put is the better choice. It ends with what to expect at a public shelter and how to come home safely.

Who decides: you or the officials?

Most of the time, local officials make the call. Your county emergency manager, sheriff, fire chief or mayor has information you don't: where the water is rising, which way the smoke or chemical cloud is moving, which roads are already closed.

My rule is simple. If the officials say leave, leave. They can see things you can't. If they say stay inside, stay inside, even if it feels like doing nothing.

You still have your own judgment. You don't have to wait for an order to leave early. If you live in a mobile home, depend on electricity for medical equipment, have small children or frail relatives, or have nowhere safe to go if the roads close, leaving early is often the smart move.

> **Tip:** Leaving early is usually easier than leaving late. Traffic is lighter, gas stations are open, and hotels still have rooms.

Words you'll hear

Term	What it means
Shelter in place	Stay inside the building you're in, or get into the nearest sturdy building, and take steps to protect yourself there.
Evacuation order	Officials are telling people in a named area to leave. Some places call this a mandatory evacuation.
Evacuation warning	Officials are telling people to get ready to leave, and some people (often those who need extra time) to go now. Some places call this a voluntary evacuation.
Evacuation zone	A named area, often a letter or number, that officials use to say who needs to leave.
Public shelter	A safe place, often a school or community building, opened for people who have to leave home.

Stay or go: a rough guide

Every situation is different, and official instructions always come first. Still, it helps to know which way each kind of emergency usually points before it happens:

Situation	Usually means	Why
Tornado warning	Shelter in place, right now	There's rarely time to drive away safely.
Chemical cloud or radiation release	Shelter in place unless told to leave	The danger is in the outside air.
Hurricane with storm surge or flooding expected in your zone	Evacuate when told, or earlier	Rising water can cut off roads and trap people who stay.
Wildfire moving toward your area	Evacuate when told, or earlier	Fires can move fast and close roads.
Hurricane winds, outside the evacuation zone, in a sturdy home	Often shelter in place	Follow local officials, and leave if they tell you to.
Mobile home in high winds or a tornado warning	Go to a sturdy building	A mobile home is not a safe shelter.

When you're not at home

Emergencies don't wait until everyone is at the kitchen table. Think through these ahead of time:

- **At work.** Learn your workplace's plan for tornadoes, fires and lockdowns. Know where the shelter area is and who takes a head count.
- **Kids at school or daycare.** Schools have their own shelter and evacuation plans. Rushing to the school can put you on dangerous roads and clog the routes emergency crews need. Learn the school's pickup and reunification plan now, and keep your contact information current with the school.
- **In the car.** Keep your car kit stocked (Chapter 5), and listen to local radio when bad weather threatens.
- **Visiting or traveling.** When you check into a hotel or stay with friends, take a moment to find the exits and ask where people go in a storm.

Know your zone

Many coastal counties divide their land into hurricane evacuation zones. Some areas also have zones for wildfires, tsunamis, dams or nuclear power plants. When officials order an evacuation, they often name zones rather than streets, so you need to know yours before the day comes.

The National Weather Service (NWS) advises people near the Gulf and Atlantic coasts to find out whether they live in a hurricane evacuation area by contacting their local government or emergency management office. Many counties also post zone maps online: search for your county name plus "evacuation zone" and use the official county or state map.

Write your zone on your family plan and on a card in your go-bag. Look up the zones for your workplace and your kids' school while you're at it.

Get ready to leave

Before anything happens

- Know at least two ways out of your neighborhood, plus a backup route to where you'd go. The road you always use may be closed or jammed.
- Pick places to go: a friend or relative outside the danger area, a hotel or motel farther away, or a public shelter.
- Keep a go-bag ready for each person (Chapter 5) and keep important papers together (Chapter 2).
- Keep the car's gas tank at least half full, as the American Red Cross suggests.

- If you don't have a car, find out now how your county helps people without transportation evacuate, and make a plan with family or neighbors.
- Plan for your pets. Find pet-friendly places to stay ahead of time.

When an evacuation looks likely

If a hurricane or a wildfire is headed your way, you may get a day or more of warning. Use it well.

- ☐ Fill the gas tank and get some cash
- ☐ Charge phones and power banks
- ☐ Load go-bags, medicines, chargers, glasses and important papers into the car
- ☐ Decide where you'll stay and tell your out-of-area contact your plan
- ☐ Bring in outdoor furniture and anything that could blow around
- ☐ Get pet carriers, leashes, food and records together

You might ask, "What if I pack the car and they never order an evacuation?" Then you unpack the car. That's a good day, not a wasted one.

When it's time to go

1. Leave when officials tell you to, or sooner if you feel unsafe.
2. Grab your go-bags, medicines and pets.
3. Unplug appliances if you have time. Turn off utilities only if officials tell you to (Chapter 9 explains how).
4. Lock your doors and windows.
5. Tell your out-of-area contact that you're leaving and where you're headed.
6. Use the routes officials name. Shortcuts may be blocked or dangerous.

Caution: Never drive through flooded roads. Just 12 inches of fast-moving water can carry away a small car, and 18 to 24 inches can carry away most large SUVs, vans and trucks. Turn Around Don't Drown.

Where to go

Friends and family

Staying with friends or relatives outside the danger area is usually the most comfortable choice. Ask them now whether you could come in an emergency, and offer the same to them. Agree on how you'll let them know you're on the way.

Hotels and motels

Rooms fill up fast when a big storm is coming. If you plan to use a hotel, book early, choose a place far enough away to be out of danger, and ask whether they accept pets.

Public shelters

Public shelters are opened during disasters by local governments, the American Red Cross and other groups. They're the right choice if you have nowhere else to go, and they're a much better choice than staying in a place officials have told you to leave.

The Red Cross says its shelters are open to anyone in need and that its disaster help is free. You don't need to show identification. You give your name and where you lived before the disaster.

According to the Red Cross, its shelters offer:

- A safe place to sleep, with meals, snacks and water
- First aid, and help replacing prescriptions and eyeglasses lost in the disaster
- Emotional support and mental health services
- Help reconnecting with family
- Caseworkers to help with your recovery
- In some emergencies, childcare and laundry

Be ready for a shared space with many people, little privacy and a cot rather than a bed. Bring what helps you and your family feel settled.

What to bring to a shelter:

- Your emergency kit or go-bag
- Medicines, plus a written list of them
- Bedding, such as a pillow and a blanket or sleeping bag
- Clothing for several days
- A comfort item for each child, like a favorite stuffed animal or blanket
- Phone, chargers and a power bank
- Glasses, hearing aids, mobility aids and spare batteries

The Red Cross asks people not to bring alcohol, illegal drugs or weapons to its shelters.

The Red Cross also says that all its shelters are accessible to people with disabilities, and that you should tell shelter staff about any medical equipment, supplies, food, cultural or religious needs you have.

Finding an open shelter

When shelters open, local officials and news outlets announce them. You can also check your county emergency management website and social media, or use the shelter map on the Red Cross website at redcross.org, or contact your local Red Cross chapter.

Pets and service animals

The Red Cross says service animals are always welcome in its shelters and are not considered pets. Pets are welcome when possible, but they may be housed in a separate area, sometimes in a pet shelter run with local animal welfare groups.

Policies differ by shelter, so plan ahead: keep a list of pet-friendly hotels and friends who would take your animals, and keep a carrier, leash, food, bowls and vaccination records in your pet's go-bag (Chapter 5).

Shelter in place

Sometimes leaving is more dangerous than staying. When a tornado is bearing down, there's no time to drive away. When a chemical cloud or radioactive dust is in the air, being outside is the danger. Then the safest move is to get inside and make your shelter as protective as possible.

Threat	Best place to shelter	Key steps
Tornado	A basement, safe room, or an interior room away from windows	Bring pets if there's time. Mobile homes, tents and vehicles are not safe places to stay.
Chemical release	A room you can seal, with few or no windows, away from outside walls and as high up in the building as you can	Close and lock windows and doors and turn off fans, heating and cooling. Seal the room with plastic sheeting and duct tape.
Radiation	Inside a building, in the basement or the middle of the building, away from outside walls and the roof	Get inside, stay inside for at least 24 hours unless told otherwise, and stay tuned.

Tornado

The NWS says that during a tornado warning you should go to your basement, a safe room, or an interior room away from windows, and take your pets if there's time. A mobile home or a tent is not a safe place, so if you live in one, know ahead of time which sturdy building you'll go to.

At work or school, follow your tornado drill and go to the shelter area quickly and calmly. The NWS advises staying away from windows and large open rooms such as cafeterias, gyms and auditoriums.

The NWS also says being in a vehicle during a tornado is not safe. The best choice is to drive to the nearest shelter. If you can't, the NWS lists two last-resort options: get down in your car and cover your head, or leave the car for a low spot such as a ditch or ravine. Chapter 12 covers tornadoes in more depth.

Chemical release

If officials tell you to shelter in place because of a chemical release, act quickly. The Centers for Disease Control and Prevention (CDC) gives these steps:

1. Go inside and bring your pets with you.
2. Lock the windows and doors. Turn off the fan, air conditioner and furnace, and close the fireplace damper.
3. Go to your shelter room and shut the door. The CDC says this room should have few or no windows, be as far from the outside as possible, be at the highest point in the building, and have a water source if possible. Notice that this is the opposite of tornado and radiation advice: for a chemical release, go up, not down.
4. Bring your go-bags, everyone's medicines (pets' too), and your phone and charger.
5. Seal the room. Use duct tape to put plastic sheeting over the windows, close the vents and tape them over, and tape around the door. If you don't have plastic, the CDC says to stuff towels, sheets or clothing into the vents and under the door.
6. Keep a radio or a news app on, and let an out-of-area friend or relative know where you are.

The CDC says you may need to stay put for a few hours, possibly a few days, or longer. Don't come out on your own guess. Wait for the "all clear" from police, fire or other local officials, and follow their instructions for going back outside.

If you're outside or in a car when it happens, the CDC warns that vehicles may not be airtight enough to protect you. Listen to the radio or check your phone for the nearest shelter, and go there.

> **Tip:** Keep a roll of duct tape and some precut plastic sheeting in your home kit. Measure and label the pieces for your shelter room now, so you aren't cutting plastic with shaking hands later.

Chapter 20 covers chemical emergencies in detail.

Radiation

For a radiation emergency, the CDC message is "Get Inside, Stay Inside, Stay Tuned." The CDC says the walls of a building can block much of the harmful radiation, and radioactive material gets weaker over time.

- A brick or concrete building with several floors, or a basement, is best, but the CDC says any building is safer than being outside.
- Once inside, go to the basement or the middle of the building, as far from the outside walls and roof as you can.
- If you were outside, take off your outer layer of clothing before you go in, if you can, and wash the skin that was uncovered.
- Bring pets inside if you can.
- The CDC says staying inside for at least 24 hours can protect you and your family until it is safe to leave the area. Follow official instructions on when to come out.

Chapter 21 covers radiation emergencies in detail.

Staying put in a storm

If officials haven't told you to leave and you're riding out a storm at home, stay inside, away from windows, and keep listening for updates on a battery radio or your phone. Chapter 11 covers hurricanes and Chapter 10 covers power outages.

Coming home safely

The NWS is direct about this: if you evacuated, return home only when officials say it is safe. Roads can be blocked, bridges damaged and power lines down. Coming back too early can also put you in the way of crews clearing the way.

Once you're back, the NWS advises driving only if you need to and avoiding flooded roads and washed-out bridges.

Before you go inside, the NWS says to walk carefully around the outside of your home and check for loose power lines, gas leaks and structural damage. Stay out of the building if:

- You smell gas
- Floodwater is still around the building
- The building was damaged by fire
- Officials have not declared it safe

Use battery-powered flashlights, not candles, and turn the flashlight on before you go into a building that has been empty.

> **Caution:** Carbon monoxide poisoning is one of the leading causes of death after storms in areas without power, according to the NWS. Never use a generator inside your home or garage, even with the doors and windows open. The CDC says to run it outside only, at least 20 feet away from any doors, windows or vents.

Take photos of any damage before you start cleaning up. Chapter 26 covers insurance, recovery and cleanup safety.

Special notes

People with disabilities and access needs

If you or someone in your home uses a wheelchair, oxygen, dialysis or other powered medical equipment, plan to leave early. It takes longer to move safely, and power may go out. Ask your county emergency management office whether it keeps a voluntary registry of people who may need help during an evacuation. The Federal Communications Commission (FCC) suggests that people with disabilities register with their local police department.

The Red Cross says its shelters are accessible to people with disabilities. Tell shelter staff right away about equipment, supplies or diet needs.

Older adults

Check on older neighbors and relatives when an evacuation is likely. Many need a ride, help packing medicines, or just a nudge to go early.

Renters and mobile home residents

If you rent, ask your landlord or property manager what the building's emergency plan is. If you live in a mobile or manufactured home, remember that the NWS says it is not a safe place during a tornado. Know where you'll go, and go early when severe weather is coming.

Quick checklist

- ☐ Know your evacuation zone (home, work and school)
- ☐ Two routes out of your neighborhood, plus a backup
- ☐ At least one place to go outside your area, plus a backup
- ☐ Go-bags packed for each person and pet
- ☐ Car gas tank kept at least half full
- ☐ Know your tornado spot, your chemical shelter room and your radiation shelter spot at home
- ☐ Duct tape and precut plastic sheeting in your home kit
- ☐ Know how to find an open public shelter
- ☐ Wait for officials before going home

Chapter 8: First Aid and Staying Healthy

In a big emergency, an ambulance may be slow to arrive. Roads can be blocked and 911 lines can be busy. The person standing next to someone who is hurt, very often a family member, becomes the first helper whether they planned on it or not. A little training turns that moment from panic into action.

This chapter covers the basics every household should know: taking a class, stocking a first aid kit, hands-only CPR (cardiopulmonary resuscitation), stopping serious bleeding, choking, burns, carbon monoxide, poison help, keeping medicines safe when the power is out, avoiding infections after a disaster, and caring for your mind afterward. It is not medical training. It's a starting point, and a reminder of what to do while help is on the way.

> **Caution:** This chapter does not replace a first aid class or medical care. In a medical emergency, call 911. If you can't get through, keep trying, and send someone for help if you can.

Take a class first

Reading about first aid is good. Practicing it with your hands is much better. Under stress, people fall back on what they've practiced, not what they once read.

Classes worth looking for:

- **First aid, CPR and AED (automated external defibrillator).** The American Red Cross and the American Heart Association (AHA) both offer these classes. Check their websites for classes near you.
- **Stop the Bleed.** A short course that teaches anyone how to control serious bleeding. Find a class at stopthebleed.org.
- **Local classes.** Fire departments, hospitals and community colleges often teach CPR and first aid. Call your local fire department's non-emergency line and ask.

You might ask, "Do I really need a class if I've watched a video?" Yes. A video shows you what to do. A class makes sure your hands can actually do it, at the right speed and force, and gives you a chance to ask questions. If you can only do one thing from this chapter, sign up for a class.

Your first aid kit

You can buy a ready-made kit or build your own. Either way, open it, see what's inside, and add what your family needs. The Red Cross suggests keeping a kit at home and in the car, knowing where the kits are at work, and checking kits regularly, replacing anything used or past its expiration date.

The Red Cross publishes a suggested kit for a family of four. I've grouped its contents by the job each item does:

Job	What to have on hand (based on the Red Cross family-of-four list)
Small cuts and scrapes	About 25 adhesive bandages in mixed sizes, 5 antiseptic wipes, 5 small packets of antibiotic ointment, and tweezers

Job	What to have on hand (based on the Red Cross family-of-four list)
Bigger wounds	2 large absorbent dressings (5 x 9 inches), 5 sterile gauze pads in each of two sizes (3 x 3 and 4 x 4 inches), one 3-inch and one 4-inch roller bandage, 2 triangular bandages, and a roll of 1-inch cloth tape
Protecting the helper	2 pairs of non-latex gloves and a CPR breathing barrier with a one-way valve
Other care	An instant cold pack, 2 small packets of hydrocortisone ointment, 2 single doses of 81 mg aspirin, a non-glass, non-mercury thermometer, an emergency blanket, and a printed first aid guide

The Red Cross also suggests adding personal items, such as your family's medicines and emergency phone numbers, and anything your health care provider recommends.

Tip: Check the kit twice a year when you check your other supplies. Gloves, tape and ointments break down over time, and the bandages always seem to vanish faster than you'd think.

If anyone in your household has a serious allergy, asthma, diabetes or another condition, ask their doctor what to keep on hand, such as an epinephrine auto-injector or a spare inhaler, and make sure everyone knows where it is.

Aspirin is on the Red Cross list, but it isn't safe for everyone. Ask your doctor or pharmacist before anyone in your household takes it. Never give aspirin to children under 19.

Hands-only CPR and AEDs

When an adult's heart suddenly stops (called cardiac arrest), they collapse, don't respond and don't breathe normally. Without help, they can die within minutes. You don't need special equipment to help. You need your hands.

The AHA says more than 70% of cardiac arrests happen in a home or private residence. That means the person you'd help is most likely someone you love. The AHA also says that CPR from a bystander can double or triple a person's chance of surviving.

Hands-only CPR for a teen or adult who suddenly collapses (AHA):

1. Call 911 right away. Don't wait for professional rescuers to arrive before you act.
2. Place the heel of one hand in the center of the chest.
3. Push straight down, hard and fast. For an adult, the AHA says to push 100 to 120 times a minute, at least 2 inches deep.
4. Keep pushing until help or an AED arrives. When the AED comes, turn it on and follow its voice prompts.

To keep the right speed, think of the beat of the song "Stayin' Alive." The AHA uses it as a tempo guide.

You might worry, "What if I hurt them?" The AHA's answer is plain: the biggest risk is not doing something.

Caution: For infants and children, and for anyone whose heart stopped because of drowning or choking, the AHA says rescue breaths are important. A class will teach you the full steps.

AEDs

An automated external defibrillator (AED) is a portable device that can shock a heart back into a normal rhythm. They're kept in many schools, offices, gyms, airports and stores. The AHA notes that, as with CPR, an AED has to be used quickly to help.

If someone else is with you, send them to find an AED and bring it while you start CPR. An AED class (often part of a CPR class) will show you how to use one.

Stopping serious bleeding

Serious bleeding can kill quickly, sometimes before an ambulance can get there. Stop the Bleed is a national program that teaches anyone how to help.

Stop the Bleed says to always alert emergency services, so call 911 or have someone else call. It teaches three ways to control the bleeding:

- Apply pressure with your hands.
- Pack the wound and press.
- Apply a tourniquet.

Which one you use depends on the wound. A class shows you how to choose, and lets you practice packing a wound and putting on a tourniquet on a training model. That practice matters. A tourniquet has to be put on correctly to work, and you don't want your first try to be on someone you love.

Choking

Choking happens when food or an object blocks the airway. An adult or older child who is choking often grabs at the throat. MedlinePlus, the National Library of Medicine's health site, lists other danger signs: the person can't speak, makes noisy or high-pitched sounds breathing in, has a weak cough that isn't working, or starts to turn bluish.

First ask, "Are you choking? Can you speak?" If the person can cough hard and talk, don't step in. Let them keep coughing, and stay ready to help if it gets worse.

If the person can't speak or is struggling to breathe, have someone call 911 while you start first aid. For an adult or a child over 1 year old, MedlinePlus describes it this way:

1. Give 5 firm blows between the shoulder blades with the heel of your hand.
2. Then stand behind the person and wrap your arms around the waist. Kneel behind a child. Make a fist and put the thumb side just above the belly button, well below the breastbone.
3. Grab the fist with your other hand and give 5 quick thrusts, upward and inward.
4. Keep repeating 5 back blows and 5 thrusts until the object comes out or the person passes out.

For someone who is pregnant or very large, MedlinePlus says to use chest thrusts instead, with your fist on the middle of the breastbone.

If the person passes out, lay them on a firm, flat surface, make sure 911 has been called, and start CPR. Take the object out only if you can see it loose in the mouth. Never reach blindly into the throat, because that can push the object deeper. Anyone who choked badly should see a health care provider afterward.

Caution: Babies under 1 year need a different method, with back blows and chest thrusts sized for an infant. An infant CPR and first aid class will show you how. If a baby can't breathe, cry or cough, have someone call 911 right away.

Burns

For burns, quick cooling and a clean cover go a long way. This guidance comes from MedlinePlus, the National Library of Medicine's health information service.

Minor burns

1. Run cool (not ice-cold) water over the burn, or soak it in a cool water bath. Keep it in the water for at least 10 minutes, and 20 if you can. MedlinePlus gives a range of 5 to 30 minutes, and the Red Cross's scientific advisers say at least 10 minutes, ideally 20.
2. Cover it with a dry, sterile bandage or clean dressing, and protect it from pressure and rubbing.
3. Over-the-counter pain relievers such as ibuprofen or acetaminophen can help with pain and swelling. Don't give aspirin to children under 19.
4. Make sure the person's tetanus shots are up to date.

Serious burns

Call 911 for a serious burn. While you wait:

- Don't remove burned clothing that is stuck to the skin.
- Cover the burn with a dry sterile bandage or clean cloth.
- Don't put butter, oil, ice, creams or home remedies on a serious burn.
- Don't soak a large, severe burn in cold water. MedlinePlus says this can cause shock.
- Don't disturb blisters or dead skin.

MedlinePlus says to call 911 if a burn is very large (about the size of a palm or bigger), was caused by chemicals or electricity, or if the person breathed in smoke. Call a health care provider if a minor burn still hurts after 48 hours, or if you see signs of infection such as pus, fever, more pain or red streaks.

Heat and cold illness

Heat illness and cold injuries are covered in Chapter 18 (Extreme Heat and Drought) and Chapter 17 (Winter Storms and Extreme Cold). The short version: heat stroke and severe hypothermia are emergencies. Call 911.

Carbon monoxide poisoning

Carbon monoxide (CO) is a gas with no color and no smell. The Centers for Disease Control and Prevention (CDC) says it kills without warning. After storms and during power outages, people are poisoned when generators, grills, camp stoves and other fuel-burning gear are used indoors or too close to the house.

The CDC lists the most common symptoms:

- Headache
- Dizziness
- Weakness
- Upset stomach and vomiting
- Chest pain
- Confusion

The CDC says these symptoms are often described as "flu-like." Breathing a lot of CO can make a person pass out or die. People who are sleeping, or who have been drinking or using drugs, can die from CO before they ever feel sick. Infants, older adults, and people with heart disease, anemia or breathing problems are more likely to get sick from it.

Caution: If a CO alarm sounds or you think someone has CO poisoning, don't hunt for the source. The U.S. Consumer Product Safety Commission (CPSC) says to get outside to fresh air right away, call 911 or the fire department from outside or a neighbor's home, and not go back in until emergency responders say you can. If you felt sick, see a doctor and say you think it was CO.

To prevent it, the CDC says:

- Put battery-operated or battery backup CO detectors near every sleeping area, and check their batteries when you change your clocks in spring and fall.
- Never use a generator inside your home or garage, even with doors and windows open. Run it outside only, at least 20 feet away from any doors, windows or vents.
- Never burn charcoal indoors, never use a portable gas camp stove indoors, and never heat your home with a gas oven.
- Never run a car or truck in a garage attached to your home, even with the garage door open.

Chapter 9 covers CO alarms and Chapter 10 covers generators in more detail.

Poison Help

If someone swallows something they shouldn't, breathes in fumes, or gets a chemical in their eyes or on their skin, call the Poison Help line (Poison Control) at 1-800-222-1222. It's a free call that connects you to your local poison control center, and a nurse, pharmacist or other poison expert answers. Save the number in every phone in the house and write it on the card in your first aid kit.

If the person has trouble breathing, has collapsed or is unconscious, has severe chest pain or shows other life-threatening signs, call 911 right away.

Medicines and medical needs

Keep a supply and a list

Talk with your doctor and pharmacist about keeping an emergency supply of the medicines you or your family need every day. Keep a written list of each person's medicines, doses, allergies and doctors in your kit and a copy on your phone. If you have to see a different doctor or pharmacist after a disaster, that list saves a lot of time.

Medicines after a flood or power loss

The Food and Drug Administration (FDA) gives this guidance:

- Throw out medicines that touched floodwater, even if they're still in their original containers.
- If a medicine that keeps you alive got wet or wasn't kept at the right temperature, and you can't get a replacement right away, the FDA says it may be used until you can get a new supply, as long as it looks unchanged. Replace it as soon as you can.
- If a medicine has to be mixed with water, use only purified or bottled water.
- When in doubt, ask your pharmacist, your health care provider or the drug's maker whether a medicine is still safe to use.

Insulin when the power is out

Insulin should normally be kept in the refrigerator, but the FDA says that in an emergency, insulin vials and cartridges from the maker, opened or unopened, can be left unrefrigerated at 59 to 86 degrees F for up to 28 days and still work.

- Keep it as cool as you can, away from direct heat and out of direct sunlight.
- If you use ice to keep it cool, don't let the insulin freeze. Don't use insulin that has been frozen.
- Very hot or cold temperatures make insulin work less well, and the longer it's exposed, the worse it gets. The FDA says that once you can get properly stored insulin, throw out vials that were exposed to extreme temperatures.
- Always follow your doctor's instructions when you can. If you have to switch to a different insulin product in an emergency, do it under a doctor's care if at all possible, and check your blood sugar closely.

> **Tip:** A small insulated lunch bag with a cold pack (wrapped so the insulin doesn't touch it directly) can help keep insulin cool during an outage or evacuation. Keep one with your diabetes supplies.

Dialysis, oxygen and powered medical equipment

If someone in your home depends on dialysis, oxygen, or any device that needs electricity, talk with the care team now about an emergency plan: where you'd go for treatment if your usual center is closed, how long your backup batteries or oxygen supply last, and what to do if the power is out longer than that. Chapter 10 covers backup power, and Chapter 7 explains why people with powered medical equipment should evacuate early.

Infections and wounds after a disaster

After floods and storms, small cuts can turn into big problems. Floodwater can carry sewage and germs. The CDC says the best protection is to stay out of floodwater. If you must go in, wear rubber boots, rubber gloves and goggles.

For wounds, the CDC advises:

1. Wash the wound with soap and clean water as soon as you can. If you don't have soap and water, an alcohol-based product can be used.
2. Cover a clean, open wound with a waterproof bandage.
3. Get medical care right away if the wound turns red, swells or oozes.

4. For a puncture wound, or a wound that got dirt, feces or saliva in it, have a health care professional check whether you need a tetanus booster.

Wash your hands after touching floodwater. Don't let children play in floodwater areas, or with toys that floodwater touched until the toys have been disinfected.

Mental health after a disaster

Disasters are hard on the mind as well as the body. The CDC lists common reactions such as fear, worry, sadness, anger, numbness, trouble sleeping, nightmares, and headaches or stomach problems. It isn't weakness, and you don't have to handle it alone.

Disaster Distress Helpline: 1-800-985-5990. Run by the Substance Abuse and Mental Health Services Administration (SAMHSA), this helpline is for anyone in the U.S. who is having emotional distress related to a natural or human-caused disaster. You can call or text. SAMHSA says it is available 24/7, year-round, is toll-free, and offers help in multiple languages.

988 Suicide and Crisis Lifeline: 988. Call or text 988, or chat online. The 988 Lifeline says it is available 24/7/365, conversations are free and confidential, and it is for everyone, including people facing mental health struggles, emotional distress, or alcohol or drug use concerns.

Caution: If someone is in immediate danger of hurting themselves or others, call 911.

The CDC lists these healthy ways to cope:

- Look after your body: try to eat healthy food, get some exercise and plenty of sleep, and avoid alcohol and other drugs.
- Share your feelings with a friend or family member, and keep in touch with the people who support you.
- Make time to unwind and do things you enjoy.
- Take breaks from news and social media coverage of the disaster. Get your updates from trusted official sources.

The CDC says to talk with your health care provider if stress gets in the way of your daily life for several days in a row.

Kids after a disaster

Children take their cues from the adults around them. The CDC says that when you are rested and calm, you can respond better, so look after your own stress too. Then:

- Give children chances to talk and ask questions. Answer honestly, in words that fit their age, and correct rumors they pick up from friends.
- Limit how much coverage of the disaster they see. The CDC notes that repeated reminders can bring the upset back.
- Get back to normal routines, like family meals and school, as soon as you can. If routines have to change, explain why and for how long.

Reactions differ by age. The CDC lists things like more crying and wanting to be held in babies; bed-wetting, fear of being apart from you, tantrums and trouble sleeping in young children; sadness, anger, fear it will happen again and worry about going back to school in school-age kids; and in teens, acting out, pulling away from friends, more arguing, and anxiety or depression.

Most reactions fade with time. The CDC suggests talking with a pediatrician, school counselor or other child-focused professional if your child is still anxious, fearful, sad or angry more than two to four weeks after the disaster, if things are getting worse instead of better, or if the problems are getting in the way of school or relationships. The Disaster Distress Helpline can help parents too.

Quick checklist

- ☐ At least one adult in the household has taken a first aid and CPR class
- ☐ Someone in the household has taken a Stop the Bleed class
- ☐ First aid kit at home and in each car, checked twice a year
- ☐ Poison Help (1-800-222-1222) and the Disaster Distress Helpline (1-800-985-5990) saved in every phone
- ☐ Written list of each person's medicines, doses and allergies
- ☐ Emergency medicine supply discussed with your doctor or pharmacist
- ☐ Plan for insulin, dialysis, oxygen or powered medical devices
- ☐ CO detectors near every sleeping area (see Chapter 9)

Chapter 9: Home Safety: Utilities, Fire, and Carbon Monoxide

Most of this book is about storms, floods, and other big events. This chapter is about the dangers that are already inside your house: the gas line, the electric panel, the water main, the stove, the furnace, and the space heater in the corner. On a normal day they work quietly for you. During and after an emergency, they are behind some of the most common injuries and deaths.

The good news is that this is the cheapest chapter in the book to act on. A few smoke alarms, a carbon monoxide alarm, a fire extinguisher, and an afternoon of walking around your house with a flashlight will do more for your family's safety than almost any gadget you could buy.

Know your utilities before you need them

Every home has three main shutoffs: water, electricity, and (in many homes) natural gas or propane. You don't want to be hunting for them for the first time in the dark, with water spraying out of a broken pipe or the smell of gas in the kitchen.

I'd make this a family project. Walk the house and the yard together, find each shutoff, and show every adult and older teen in the house where it is and how it works. Write the locations on your family emergency plan from Chapter 2.

Water

Most main water shutoff valves are outside under a small cover, or in a basement or crawlspace where the main water line enters the home. If you can't find yours, ask your water utility, your landlord, or a plumber.

Shutting off the water is useful when a pipe bursts or a water heater leaks. Depending on the emergency, it may also be wise to shut it off until officials say the water is safe to drink. Chapter 3 covers water safety notices and how to make water safe to drink.

- Find the main valve and label it with a tag.
- Turn it off and back on once, so you know it works and isn't frozen in place.
- If it is stuck or leaking, have a plumber look at it now, not during an emergency.

Electricity

Your main electrical panel (the breaker box, or a fuse box in some older homes) is usually in a garage, basement, utility room, or on an outside wall. Most panels have a main breaker that turns off power to the whole house, plus smaller breakers for each circuit.

> **Caution:** Never turn power on or off, or use an electric tool or appliance, while you are standing in water. The Centers for Disease Control and Prevention (CDC) says not to walk through standing water to reach the main power switch; call an electrician to turn it off. If your home has flooded, don't turn the power back on until a qualified electrician has inspected the electrical equipment.

If you need to turn off all the power, local emergency managers advise switching off the individual circuit breakers first, then the main breaker. Label your breakers if they aren't already labeled. It takes an hour with a helper and a lamp, and it pays off every time a breaker trips.

Natural gas and propane

If your home uses natural gas, the main shutoff is usually a valve on the pipe next to the gas meter outside. Propane tanks have their own shutoff valve on the tank.

Here is the rule I want every reader to remember: shut off the gas only if you smell gas, hear gas escaping, suspect a broken gas pipe or appliance, or officials tell you to. Don't turn it off "just in case." Once the gas is off, never turn it back on yourself. The Earthquake Country Alliance says only utility workers or qualified plumbers can restore it, and after a big disaster the demand for them can mean long delays.

If you smell gas, here's what to do:

1. Open a window if it's right there, and get everyone out of the house quickly.
2. While you are inside, I'd avoid anything that could make a spark: light switches, a phone, or starting a car in the garage.
3. Once you are outside and away from the house, call the gas company or 911. The U.S. Consumer Product Safety Commission (CPSC) says to contact the gas authorities from outside the home.
4. If you don't know where the leak is and it is safe to do, you can turn off the gas at the outside main valve, then call from a neighbor's home. Getting people out comes first.
5. Don't go back in until the gas company or fire department says it is safe.

Tip: The Earthquake Country Alliance says to keep a wrench readily available for turning off the gas. Keep it near the meter or in your home kit, and make sure it fits before you need it.

Smoke alarms: the cheapest lifesaver in the house

You might ask, "Do I really need more than one smoke alarm?" Yes. Fires often start at night. The U.S. Fire Administration (USFA), part of the Federal Emergency Management Agency (FEMA), says about half of home fire deaths happen between 11 p.m. and 7 a.m., when most people are asleep. A smoke alarm is what wakes you up.

Fire also moves faster than most people think. Ready.gov says a fire can become life-threatening in about 2 minutes, and a home can be engulfed in flames in about 5 minutes. A small flame can turn into a major fire in less than 30 seconds. That is why the early warning matters so much.

Where to put them

The USFA recommends smoke alarms in these places:

- Inside every bedroom.
- Outside each sleeping area (for example, the hallway outside the bedrooms).
- On every level of the home, including the basement.

Larger homes may need more. The USFA also recommends interconnected alarms, which are wired or linked wirelessly so that when one sounds, they all sound. That way, a fire in the basement wakes up the people sleeping upstairs.

Testing and replacing

- ☐ Test every smoke alarm once a month by pressing the test button.
- ☐ Replace batteries twice a year, unless the alarm has a 10-year sealed lithium battery.
- ☐ Replace the whole alarm when it is 10 years old, when it fails a test, or as the maker directs.
- ☐ Never take the battery out or cover the alarm because it goes off while you cook. Open a window or fan the smoke away instead.

> **Tip:** Look on the back of each alarm for a date. If you can't find one, or it is more than 10 years old, replace it.

People who may not wake up to an alarm

Children and older adults sometimes sleep right through a smoke alarm. The USFA says to make sure someone is assigned to wake them. For anyone who is deaf or hard of hearing, there are alarms that use flashing lights or a vibrating pad under the pillow or mattress. Ready.gov lists these options. Some local fire departments help install alarms; it is worth a call to the non-emergency line to ask.

Your home fire escape plan

A smoke alarm only buys you time. You still need a plan for using that time. Ready.gov and the USFA guidance comes down to a few habits:

1. Find two ways out of every room, in case one is blocked by fire or smoke. For most bedrooms, that means the door and a window.
2. Check that windows open easily, screens come out quickly, and any security bars have a quick-release that works from inside.
3. Pick a meeting place outside, a set distance from the house, such as a neighbor's mailbox or a particular tree.
4. Practice the plan twice a year. Practice it in the dark or with your eyes closed at least once, since real fires often happen at night and smoke makes it hard to see.
5. Teach children not to hide from firefighters. A firefighter in full gear can look scary; kids need to know that person is there to help.
6. If someone in the home uses a walker or wheelchair, make sure the exits you plan to use are wide enough and clear.

When the alarm goes off

- Get out and stay out. Don't stop to grab belongings, and don't go back in for anything.
- Go to your meeting place and count heads.
- Call 911 from a cell phone or a neighbor's phone.

- Don't go back inside until firefighters say it is safe.

If you are trapped, Ready.gov says to cover vents and the cracks around doors to keep smoke out, and signal for help at a window. If your clothes catch fire: stop, drop, and roll. For a minor burn, cool it under cool running water for at least 10 minutes, and get medical help for anything more serious (Chapter 8 covers burns).

> **Caution:** Once you are out, stay out. Going back in for pets, phones, or papers can cost a life. Tell firefighters right away if a person or pet is still inside. They have the gear and training to go in. You don't.

Fire extinguishers: helpful, with limits

A fire extinguisher can put out a small fire, like a pan fire that has spread to a dish towel. It cannot fight a fire that is already spreading across a room. Getting out is always the first job.

The CDC recommends keeping a multipurpose, dry-chemical fire extinguisher nearby, especially near heating equipment. The USFA explains the letters on the label:

Class	What it puts out	Where it matters
A	Ordinary materials such as cloth, wood, and paper	Homes and businesses
B	Flammable liquids such as grease, gasoline, and oil-based paint	Homes and businesses
C	Electrical equipment	Homes and businesses
D	Flammable metals	Mostly factories
K	Vegetable oils, animal oils, and fats in cooking appliances	Commercial kitchens

For a home, the USFA says to look for a multipurpose extinguisher labeled "A-B-C", with a label showing it was tested by a recognized lab, and to pick the largest one you can handle safely and comfortably. Most home improvement stores carry them.

Where to keep them: the USFA says to keep an extinguisher where you can reach it easily in an emergency, with nothing blocking it. I'd put one in the kitchen (near an exit, not right next to the stove), one in the garage, and one on each level of the house. Read the label the day you buy it.

Check each one now and then, per the USFA: nothing blocking it, the pressure gauge reading in the right range, no dents, rust, or damage to the can, hose, or nozzle. Some kinds need to be shaken monthly, some need pressure testing every few years, and some must be replaced rather than recharged. Follow the label.

Using an extinguisher: PASS

The USFA teaches four steps, remembered as "PASS":

1. Pull the pin.
2. Aim low, at the base of the fire, not at the flames.
3. Squeeze the lever slowly and evenly.
4. Sweep the nozzle from side to side.

When to fight a fire, and when to leave

The USFA says to use an extinguisher only when all of these are true:

- Everyone else in the building has been warned.
- Someone has called the fire department.
- You are physically able to use the extinguisher. Young children and older adults should not try.
- The fire is small and contained to one object or surface, like a wastebasket or a pan.
- You are safe from the smoke.
- You have a clear way out.

Caution: If any of those is not true, or you aren't sure, don't fight the fire. Warn others, get out, and call 911 from a cell phone or a neighbor's phone.

Tip: Never throw water on a grease fire in a pan. Slide a lid over the pan and turn off the burner if you can do it safely.

Carbon monoxide: the gas you can't see or smell

Carbon monoxide (CO) is a poison gas made whenever fuel is burned. The CDC lists cars and trucks, small engines (such as generators), stoves, lanterns, grills, fireplaces, gas ranges, and furnaces as sources. You can't see it and you can't smell it. It can build up quietly inside a home and kill people in their sleep.

The risk goes up during emergencies, because that is when people bring generators, grills, and camp stoves too close to the house or inside it to stay warm or cook. This is one of the most important sections in the whole book.

Signs of carbon monoxide poisoning

The CDC says the most common symptoms are headache, dizziness, weakness, upset stomach, vomiting, chest pain, and confusion. People often describe it as "flu-like." A lot of CO can make you pass out or kill you. The CDC also warns that people who are sleeping or who have been drinking can die from CO before they ever have symptoms.

Everyone is at risk. The CDC says infants, older adults, and people with chronic heart disease, anemia, or breathing problems are more likely to get sick from CO.

If you suspect carbon monoxide

1. Never ignore a CO alarm. The CPSC says to get outside right away and call 911.
2. Bring everyone, including pets, out into fresh air, and make the call from outside.
3. Don't go back in until the fire department or utility says it is safe.
4. Anyone with symptoms needs medical care, even if they start to feel better outside.

CO alarms

The CDC says to install battery-operated or battery back-up CO detectors near every sleeping area in your home. The CDC suggests checking the batteries when you change your clocks in the spring and fall, and

replacing the detector every 5 years or as the manufacturer's instructions say. (Smoke alarms are different: replace them at 10 years. Both numbers are correct.) If you use a fireplace, wood stove, or space heater, the CDC also suggests putting a smoke alarm and a battery-operated CO alarm near the area being heated, testing them monthly, and replacing the batteries twice a year.

The CPSC says interconnected CO alarms are best, so that when one sounds, they all sound, and it says to test CO and smoke alarms monthly. Combination smoke and CO alarms are fine if they cover both jobs everywhere they're needed.

The CO rules that save lives

These come straight from CDC guidance. I'd post them on the fridge before storm season.

- Never use a generator inside your home or garage, even if the doors and windows are open.
- Run generators outside, more than 20 feet from doors, windows, and vents. Chapter 10 covers generator safety in detail.
- Never burn charcoal indoors. That includes the garage, a tent, or a camper.
- Never run a car or truck inside a garage attached to a house, even with the garage door open.
- Never use generators, grills, or camp stoves indoors or in enclosed spaces.
- Use fireplaces and wood stoves only if they are properly vented to the outside.
- Have a qualified technician check your furnace and its vents every winter, and have your chimney or flue inspected each year if you use a fireplace or wood stove.

Caution: Never use a gas stovetop, oven, grill, or clothes dryer to heat your home. Ready.gov warns against all of these. They are not built for it, and fuel-burning ones can fill the house with carbon monoxide.

Candles: use flashlights instead

When the power goes out, many people reach for candles. I'd rather you reach for a flashlight. Candles are an open flame in a dark house, often near curtains, kids, and pets.

The CPSC suggests flashlights or battery-operated candles instead. If you do use candles, Ready.gov says to keep them at least 12 inches from anything that can burn. Put them in sturdy holders on a level surface. The CPSC says never to leave burning candles unattended, and to put them out when you leave the room and before you sleep.

Tip: Put a flashlight and spare batteries in every bedroom, and a battery lantern in the kitchen. Chapter 10 covers lighting during outages.

Space heaters and other heating equipment

Heating equipment is a major cause of home fires in winter. The USFA's heater safety guidance is short and worth following exactly:

- Use only heaters tested and labeled by a recognized testing laboratory.
- Choose a heater with an automatic shutoff that turns it off if it tips over.

- Never leave a heater running when no one is in the room. The CPSC also says never to run a portable heater's cord under a rug or carpet.
- Keep anything that can burn (bedding, clothing, curtains) at least 3 feet away from the heater.
- Set the heater on a firm, level surface.
- Turn the heater off when you go to bed or leave the room.
- Plug an electric space heater directly into a wall outlet. Don't use an extension cord or power strip.
- Don't plug anything else into the same circuit as the heater.

For kerosene heaters, the USFA says to use only heaters from a recognized testing laboratory, always use the proper fuel, and refuel outside once the heater has cooled. Fuel-burning heaters also make carbon monoxide, so all the CO rules above apply.

> **Tip:** Make a "3-foot kid-free zone" around space heaters, fireplaces, and wood stoves. Explain it to kids the same way you explain a hot stove.

Fireplaces and wood stoves

- Have the chimney inspected and cleaned every year by a professional (USFA). Ready.gov also suggests checking chimneys and stovepipes monthly for damage or blockage during the heating season.
- Keep a glass or metal screen in front of the fireplace so embers and sparks can't jump out (USFA).
- The USFA says to put ashes in a metal container with a lid, outside, at least 10 feet from your home.

Grills, fuel, and the garage

Outdoor grills are fine outdoors and deadly indoors. Ready.gov says to keep grills at least 10 feet away from siding and deck railings. Never bring a charcoal or gas grill into a house, garage, or tent to cook or for warmth.

Many households keep gasoline for a mower or generator and propane cylinders for a grill. The CPSC says gasoline, propane, kerosene, and other flammable liquids should be stored outside living areas in properly labeled, non-glass safety containers. Follow the label, keep fuel away from children, and check your local fire code for how much you may keep at home. Chapter 10 covers generator fuel.

Secure the heavy things

In an earthquake, and even in a hard wind or a bump from a child climbing, tall furniture, TVs, and water heaters can tip over. Strapping your water heater also helps protect the gas line and water line attached to it. Chapter 15 covers how to secure furniture and water heaters.

Renters and people in apartments

If you rent, you still need to know where the shutoffs are. Ask your landlord or building manager to show you the water shutoff for your unit, the breaker panel, and whether the building has gas. In apartment buildings, learn both exit stairways on your floor, and never use the elevator during a fire.

Check that your unit has working smoke and carbon monoxide alarms. Rules about who must provide and maintain alarms differ by state and city, so check your lease and your state and local rules. Even if the landlord is responsible, you can still test them yourself every month and report problems in writing.

A home safety walk-through

Set aside one afternoon. Grab a flashlight, a notepad, and one other person from the household.

What to check	What you're looking for
Water shutoff	Found, labeled, turns off and on
Electric panel	Found, main breaker labeled, circuits labeled, area dry and clear
Gas meter or propane tank	Found, wrench nearby if needed, everyone knows the "smell gas, get out" rule
Smoke alarms	In every bedroom, outside sleeping areas, every level; tested; under 10 years old
CO alarms	Near every sleeping area; tested; battery checked
Fire extinguishers	Multipurpose label; kitchen, garage, each level; gauge in the green
Escape routes	Two ways out of every room; windows open; bars release
Heaters and fireplaces	3 feet clear; chimney inspected this year
Fuel storage	Outside living space; proper containers; away from flames
Flashlights	One per bedroom, plus spare batteries

Quick checklist

- ☐ Find and label the water, electric, and gas shutoffs, and show every adult where they are.
- ☐ Learn the rule: smell gas, get everyone out, then call from outside.
- ☐ Put smoke alarms in every bedroom, outside sleeping areas, and on every level.
- ☐ Test smoke and CO alarms monthly; replace smoke alarms at 10 years.
- ☐ Put a CO alarm near every sleeping area.
- ☐ Make and practice a fire escape plan with two ways out of every room, twice a year.
- ☐ Keep a multipurpose fire extinguisher in the kitchen and read its label.
- ☐ Keep space heaters 3 feet from anything that can burn and turn them off at bedtime.
- ☐ Never run a generator, grill, or camp stove inside, and keep generators outside, more than 20 feet from doors, windows, and vents.
- ☐ Swap candles for flashlights in every bedroom.

Chapter 10: Power Outages

If there is one emergency nearly every household in this country will face, it is a power outage. Storms, heat waves, ice, wildfires, a car hitting a utility pole, or a squirrel in the wrong place can all leave you in the dark. Most outages are short. Some last days, and a few last a week or more after a big storm.

This chapter covers how to get ready for an outage, what to do while the power is off, how to use a generator without poisoning your family, and what to check when the lights come back on. It is one of the most practical chapters in the book, because almost everything here also helps during hurricanes, winter storms, heat waves, and floods.

Why the power goes out, and for how long

Electricity travels from power plants over high-voltage lines to substations, then over local lines to your street and your home. Damage anywhere along that path can cut your power. Weather is a common cause: wind, ice, lightning, and falling trees can bring down lines. Heat waves and cold snaps can also strain the system when everyone runs air conditioning or heat at once.

Some utilities, especially in wildfire country, may also turn off power on purpose when weather and landscape conditions raise the risk that their lines could start a fire. In California, regulators call this a public safety power shutoff (PSPS). The American Red Cross notes that utility officials may come to your door to warn you of a planned outage, which is one more reason to sign up for your utility's alerts.

How long will it last? Nobody can promise. A blown transformer may be fixed in a few hours. After a hurricane or ice storm, crews may need days or longer to rebuild lines, and homes at the end of long rural lines often wait the longest. I'd plan to get through at least several days on your own, which matches Ready.gov's general advice to keep a several-day supply of water and food (Chapters 3 and 4).

You might ask, "What about the whole grid going down?" Very large regional outages are much less common than local ones. Chapter 23 covers long, wide-area disruptions in calm, factual terms. This chapter focuses on the outages that actually happen to most of us.

Before the power goes out

Light

Flashlights and battery lanterns are the safest light in a dark house. Put one in every bedroom, one in the kitchen, and one in the car. Headlamps are handy because they leave both hands free for cooking, caring for kids, or finding the breaker panel.

- Keep spare batteries in the sizes your lights use, and check them a couple of times a year.
- Avoid candles. The U.S. Consumer Product Safety Commission (CPSC) says to use flashlights or battery-operated candles instead. Chapter 9 has more on candles.

Information

When the power is out, your TV and internet router are out too. Your phone may still work, but cell towers can lose power or get overloaded.

- Keep a battery-powered or hand-crank radio that also receives NOAA Weather Radio. Chapter 6 covers alerts and radios.
- Sign up for your utility's outage alerts by text or email, and save the utility's outage phone number in your phone and on paper.
- Bookmark your utility's outage map. Many utilities post where the outages are and when they expect power back.

Phone charging

Ready.gov says to keep phones and other electronics charged before an outage.

- Keep one or two charged portable battery packs (power banks) and the right cables.
- A car charger works when the car is running outdoors. Never run a car in a garage to charge a phone, even with the garage door open.
- Put your phone in low-power mode and close apps you don't need as soon as the power goes out.

Caution: Never run a car or truck inside a garage attached to a house, even with the garage door open. Carbon monoxide can build up quickly and get into the home.

Medical needs that use electricity

If anyone in your home relies on power for medical reasons (oxygen concentrators, home dialysis, breathing machines, powered wheelchairs, medications that must stay cold such as insulin), the power outage plan for that person comes first.

1. Ready.gov says to talk to your doctor and make a plan for how you will use medical devices that need electricity. Ask the doctor or equipment supplier how long the device's batteries last.
2. Ask the supplier about backup batteries or a backup power option for the device.
3. Call your electric utility and ask whether it has a medical needs or priority program. Many do. Joining one is not a promise that your power will be restored first, so you still need a backup plan.
4. Know where you could go if the outage drags on: a relative's home, a hospital, or a local shelter or community center with power. Ask your local emergency management office what it offers.
5. Know the medicine rule from Ready.gov: replace refrigerated medicines if the power is out for a day or more, unless the drug's label says otherwise. If you depend on a refrigerated medicine that has been at room temperature, call your doctor or pharmacist.

Food and water

Ready.gov suggests keeping a thermometer in the refrigerator and freezer so you can tell whether food is still at a safe temperature. Freeze some water in clean plastic jugs or containers now. They help keep the freezer cold during an outage and become drinking water as they melt. Keep a cooler or two and know where they are. Chapter 4 covers food safety in detail; the key numbers are in "During" below.

If your home gets water from a well, the pump needs electricity, so no power means no water. Keep extra stored water (Chapter 3).

The garage door, the car, and cash

- Find the manual release on your electric garage door opener (usually a cord hanging from the track) and practice using it with the owner's manual in hand. A dead opener can trap your car inside.
- Keep your car's gas tank at least half full, as the Red Cross suggests. Gas station pumps need electricity too.
- Keep some cash in small bills. Card readers and ATMs may not work in an outage.

Protect your electronics

Ready.gov says to unplug appliances, equipment, and electronics during an outage to avoid damage from electrical surges.

Decide what matters most

If you have a generator or power station, Ready.gov points out that you may not be able to power all your appliances at one time. Make a short list now of what you'd plug in first: maybe the refrigerator, a medical device, a fan or a few lights, and phone chargers.

During a power outage

Here is what to do, roughly in this order:

1. Check whether it is just your home. Look at your breaker panel and peek at the neighbors' houses or streetlights. If only your home is dark, a tripped breaker may be the cause.
2. Report the outage to your utility. Don't assume someone else did.
3. Grab flashlights, not candles.
4. Keep the refrigerator and freezer doors closed.
5. Unplug electronics and appliances, and leave one lamp switched on so you know when the power comes back.
6. Check on family, older neighbors, and anyone who relies on medical equipment.
7. Listen to the radio or check your phone for updates on how long the outage may last.

Food safety: the numbers to know

These come from FoodSafety.gov, the federal government's food safety site:

What	How long it stays safe with the door closed
Refrigerator	About 4 hours
Full freezer	About 48 hours
Half-full freezer	About 24 hours

- Keep the doors closed as much as you can.
- After 4 hours without power, throw out refrigerated meat, poultry, fish, eggs, and milk.
- Thawed frozen food can be refrozen only if it still has ice crystals or is at or below 40 degrees F.
- FoodSafety.gov's broader rule: throw out perishable food that has been above 40 degrees F for 2 hours or more.
- Never taste food to decide whether it is safe. When in doubt, throw it out.

Tip: An appliance thermometer in the fridge and the freezer takes the guesswork out of these decisions. Chapter 4 goes into more detail.

Staying warm or cool

In winter, close off rooms you aren't using, gather everyone in one room, and dress in layers. Chapter 17 covers cold weather in detail. In summer heat, stay on the lowest floor, keep blinds closed, drink water, and go to a cooling center or a cooler place if you need to. Chapter 18 covers heat.

Caution: Ready.gov says never use a gas stovetop, oven, grill, or dryer to heat your home, and don't use candles for heat either. The Centers for Disease Control and Prevention (CDC) says never to use generators, grills, or camp stoves indoors or in enclosed spaces. They make carbon monoxide, a poison gas you can't see or smell.

If the house gets dangerously hot or cold and the outage won't end soon, leave. Go to a relative's home, a friend's, or a public warming or cooling center. Local emergency management offices and the 211 helpline can tell you what's open. Chapter 7 covers deciding when to go.

Check on your neighbors

Older adults, people living alone, families with babies, and anyone on medical equipment can get into trouble quickly when the power is out for a long time. A knock on the door or a phone call is a simple thing that matters. If someone seems confused, very cold, or very hot, call 911.

Generators: useful, and the most dangerous thing in this chapter

I want to be blunt here. Portable generators can be a big help during an outage. Used wrong, they kill. A running generator makes carbon monoxide (CO), and running one in a garage, basement, or next to an open window can kill the people inside.

The carbon monoxide rules

These come from the CDC:

- Never use a generator inside your home or garage, even if the doors and windows are open.
- Keep the generator outside, at least 20 feet away from any doors, windows, or vents. Ready.gov says the same: outdoors and at least 20 feet from building openings.
- Install a battery-operated or battery back-up CO alarm near every sleeping area in your home. Ready.gov adds: smoke and CO alarms on every level of the home, with battery backup if they are hard-wired.

Caution: The CPSC says never run a portable generator inside a home, garage, basement, crawlspace, shed, or other enclosed space, and not on a porch or in a carport either. Opening doors or windows will not give enough fresh air to stop carbon monoxide from building up to deadly levels. Point the generator's exhaust away from your home and other buildings' doors.

- If a CO alarm sounds, never ignore it. The CPSC says to get outside right away and call 911.

- When shopping for a portable generator, the CPSC suggests looking for one with a CO shut-off safety feature.
- Check and maintain the generator regularly so it works when you need it.

Portable vs. standby generators

Type	How it works	Main points
Portable generator	Gas or other fuel; sits outside; you plug appliances into it with outdoor-rated extension cords	Lower cost; must be refueled; must run far from the house
Standby (permanent) generator	Installed outside by a professional; connected to your home wiring; starts on its own	Higher cost; professional installation, and check local permit rules; still makes CO, so placement matters
Portable power station	A large rechargeable battery with outlets; no engine	No fumes, safe indoors; runs small devices only for limited time; must be recharged

Connecting a generator safely

The CPSC says to connect appliances to the generator with heavy-duty extension cords made for outdoor use. If you want to connect a generator permanently to your house wiring, the Red Cross says to have an electrician install a power transfer switch. I'd hire a licensed electrician and check with your utility and local permit office first.

Caution: Never try to power your house wiring by plugging a generator into a wall outlet. The CPSC calls this "backfeeding" and says it is extremely dangerous: it is an electrocution risk to utility workers and neighbors. The Red Cross adds that it puts your own household at risk too. The CDC says not to connect a generator to your home's electrical circuits without an approved automatic-interrupt device, and to check with your utility about using a generator. If a generator is still connected when the power comes back, it can become a major fire hazard and may endanger line workers restoring power in your area.

Fuel and running tips

- Before refueling, turn the generator off and let it cool down (CPSC and Red Cross). The Red Cross notes that gasoline spilled on hot engine parts could ignite.
- Never store generator fuel in the home. The CPSC says to keep it in labeled, non-glass containers outside living areas.
- Keep it dry. The CPSC says to run it on a dry surface under an open, canopy-like structure, and to dry your hands before touching it. Some owner's manuals say to wait until rain or snow passes.
- Read the owner's manual before the storm, not during it. Practice starting it once a season.

Portable power stations and solar

A portable power station is a big battery pack with regular outlets and USB ports. Because it has no engine, it makes no carbon monoxide and can be used indoors. It can run a phone, a lamp, a fan, or a small medical device for a while, depending on its size. Some can be recharged from a folding solar panel during the day.

Before you buy, check the watts your devices use (it's on the label) and compare that to the power station's rated capacity. For a medical device, ask the device maker whether it can safely run on one. A small station won't run a refrigerator or furnace for long, so don't count on it for that.

Downed power lines

After storms, power lines may be on the ground, in trees, or lying in water. Treat every one as dangerous, whether or not it is sparking.

The Red Cross and the Illinois Emergency Management Agency give clear rules that apply anywhere in the country:

- Always assume a downed wire is carrying electricity that can badly hurt or kill you (Illinois). Don't try to figure out whether it is "dead."
- Don't touch it. The Red Cross says to stay at least 35 feet away from a fallen power line and anything it is touching, and keep kids and pets back too.
- If a downed line is near water, even a small puddle, stay well away from the water.
- Call 911 right away to report a fallen power line, and let the utility know too.
- Don't drive or walk over a downed line (Illinois).

If a line falls on your car while you're inside, stay in the vehicle. The CDC says that if you are driving, keep driving away from the line, and if the engine stalls, don't turn off the ignition. If you can't move, stay inside until help arrives. Anyone who touches the car or the ground around it can be hurt, so warn people to stay back, and call or have someone call the utility and 911. The CDC also says not to drive through standing water if downed power lines are in it.

When the power comes back on

- Wait a few minutes before turning everything back on. Plug in and switch on appliances one at a time to avoid a surge.
- Go through the refrigerator and freezer using the food safety rules above. When in doubt, throw it out.
- Reset clocks, alarms, and thermostats, and check that your heating or cooling is working.
- If you used a generator, shut it off, let it cool, and store it and its fuel safely.
- Restock what you used: batteries, water, charged power banks. Ready.gov suggests checking supplies regularly and before predicted extreme weather.
- Check that your smoke and CO alarms still work, especially hard-wired ones with battery backups.

Renters, apartments, and mobile homes

Renters should ask the landlord or building manager what happens in an outage: whether there is backup lighting in the halls and stairwells, whether elevators will work, and whether the building has a generator. In a high-rise, an outage can mean no elevator and, in some buildings, no water above certain floors because pumps need power. Plan accordingly if anyone in your home has trouble with stairs.

Many apartment leases and local rules limit or ban generators and fuel storage. Check your lease and your local rules before buying one.

Pets

Pets feel heat and cold too. Keep them inside with you, give them fresh water, and keep them away from generators, space heaters, and candles.

Quick checklist

- ☐ Put a flashlight in every bedroom and the kitchen, with spare batteries.
- ☐ Get a battery or hand-crank radio that receives NOAA Weather Radio.
- ☐ Keep one or two charged power banks and cables.
- ☐ Sign up for utility outage alerts and save the outage number.
- ☐ Make a power outage plan for anyone who uses medical equipment.
- ☐ Learn the manual release on the garage door opener.
- ☐ Freeze some water jugs and get an appliance thermometer.
- ☐ Install CO alarms near every sleeping area.
- ☐ If you own a generator: outside only, at least 20 feet from doors, windows, and vents, and never plugged into a wall outlet.
- ☐ Teach everyone: assume any downed line is live and stay at least 35 feet away.

Part 2: When It Happens

Chapter 11: Hurricanes

A hurricane is one of the few disasters you can usually see coming days ahead. Forecasters track these storms long before they reach land, which gives an ordinary household time to get ready, decide whether to leave, and make the home as safe as it can be. That warning time is a gift. This chapter is about using it well.

Most of the danger in a hurricane is not the wind people picture on the news. It is water: water pushed ashore by the storm, and rain that floods places far from the beach. If you remember one thing from this chapter, make it this: run from the water, hide from the wind.

What a hurricane is and where it hits

A tropical cyclone is a spinning storm system that forms over warm ocean water. The National Hurricane Center (NHC), part of the National Oceanic and Atmospheric Administration (NOAA), sorts them by their strongest steady wind, which it calls the maximum sustained wind.

Name	Maximum sustained wind
Tropical depression	38 mph or less
Tropical storm	39 to 73 mph
Hurricane	74 mph or more
Major hurricane	Category 3 or higher on the Saffir-Simpson scale

In the United States, hurricanes threaten the Atlantic coast from Florida to New England, the whole Gulf Coast, and Hawaii in the Central Pacific. The danger does not stop at the shoreline. The NHC says flooding is the major threat from tropical cyclones for people living inland, and these storms often drop more than 6 inches of rain over wide areas. Slower and larger storms bring more rain. So if you live a few hours from the coast, this chapter is still for you.

Hurricane season

Ocean area	Season
Atlantic (including the Gulf and Caribbean)	June 1 to November 30
Central Pacific (including Hawaii)	June 1 to November 30
Eastern Pacific	May 15 to November 30

Storms can form outside these dates. The season is simply the part of the year when they are most common, so treat the dates as a reminder to check your plan, not a promise.

The Saffir-Simpson scale

You will hear forecasters call a storm "a Category 2" or "a Cat 4." That number comes from the Saffir-Simpson Hurricane Wind Scale, which rates a hurricane from 1 to 5 by its maximum sustained wind speed.

Category	Sustained winds	What the wind can do (NHC, in brief)
1	74 to 95 mph	Very dangerous winds; some damage

Category	Sustained winds	What the wind can do (NHC, in brief)
2	96 to 110 mph	Extremely dangerous winds; extensive damage
3 (major)	111 to 129 mph	Devastating damage; well-built framed homes may lose roof decking and gable ends
4 (major)	130 to 156 mph	Catastrophic damage; well-built framed homes can lose most of the roof and some outside walls
5 (major)	157 mph or higher	Catastrophic damage; a high percentage of framed homes destroyed

Caution: The category tells you about wind only. The NHC states that the scale does not account for storm surge, rainfall flooding or tornadoes, and those can be deadly at any category. A "weak" Category 1 or a tropical storm can still flood your street and your house. Never use the category alone to decide whether to stay.

The real danger: water

Storm surge

Storm surge is the rise in sea water that a storm pushes ashore, above the normal tide. When surge comes in on top of a high tide, the total rise is called the storm tide. The NHC calls surge and large waves the greatest threat to life and property along the coast, and it calls surge the leading cause of hurricane deaths. One NWS office sums it up: water accounts for 90% of direct deaths from tropical systems.

Here is why it is so dangerous. The NHC notes that surge can reach well over 20 feet and stretch along hundreds of miles of coast. It can travel up rivers and canals and reach well inland. And water is heavy: about 1,700 pounds per cubic yard. A house, a car or a person cannot stand up to that kind of push.

You might ask, "Can't I just go upstairs?" In surge, often not. Water can rise fast, cut off roads, and batter the building itself. That is why officials order evacuations for surge zones, and why you should go when they say so.

Rain flooding

Heavy rain from a hurricane or tropical storm can flood homes hundreds of miles from the coast. Chapter 13 covers floods in detail, including how little moving water it takes to sweep away a person or a car. The short version is the National Weather Service (NWS) slogan: "Turn Around Don't Drown." The Centers for Disease Control and Prevention (CDC) adds a point worth repeating: floodwater is a drowning risk for everyone, whether or not they can swim.

Wind, tornadoes and rip currents

Hurricane-force winds, 74 mph or more, can destroy buildings and mobile homes, and strong gusts can do major damage well inland. Hurricanes can also spin up tornadoes, usually in rain bands far from the center. The NHC says these are relatively weak and short-lived, but take any tornado warning seriously (Chapter 12).

Rip currents are strong channels of water flowing away from shore. A hurricane hundreds or even more than a thousand miles offshore can make beach water dangerous. If there is a storm out at sea, stay out of the surf even when the sky above you is blue.

Alerts and the words you'll hear

The NHC and your local NWS office use specific terms. A watch means "get ready, it's possible." A warning means "it's expected, act now."

Alert	What it means	Typical lead time
Tropical Storm Watch	Winds of 39 to 73 mph are possible in the area	Within 48 hours
Tropical Storm Warning	Winds of 39 to 73 mph are expected somewhere in the area	Within 36 hours
Hurricane Watch	Winds of 74 mph or more are possible in the area	About 48 hours before tropical-storm-force winds
Hurricane Warning	Winds of 74 mph or more are expected somewhere in the area	About 36 hours before tropical-storm-force winds
Storm Surge Watch	Life-threatening flooding from rising sea water is possible	Generally within 48 hours
Storm Surge Warning	Life-threatening flooding from rising sea water is expected (danger)	Generally within 36 hours
Extreme Wind Warning	Sustained winds of 115 mph or more; issued only with major hurricanes	Issued when these winds are imminent or happening; take shelter in an interior room at once

Notice the lead times on warnings. When a Hurricane Warning goes up, the work should be nearly done, because the NHC times that warning to arrive before tropical-storm-force winds do, and those winds make outdoor work dangerous. A Hurricane Warning can also stay in effect while dangerous water levels continue, even after the wind drops.

You may also hear "Potential Tropical Cyclone." That is a disturbance that isn't a tropical storm yet but could bring tropical storm or hurricane conditions to land within 72 hours. It lets officials issue watches and warnings early. Treat it like a real storm.

Chapter 6 explains how to get these alerts on your phone and a NOAA Weather Radio.

Before: getting ready

Know your evacuation zone

Many coastal states and counties divide their area into evacuation zones. North Carolina's "Know Your Zone" system, for example, is tiered: Zone A is typically evacuated first, then Zone B, and so on. When officials order an evacuation, they usually name zones. If you don't know your zone, you won't know if the order is for you. Look it up now on your county or state emergency management website, write it down, and put it on the fridge. Chapter 7 covers evacuation steps and routes in detail.

NOAA's advice is simple: if you are at risk from hurricane impacts, you need an evacuation plan. Plan more than one route, and plan for your pets.

Insurance check before the season

Do this early in the year, not when a storm is on the map. Two facts matter most. First, homeowners and renters insurance doesn't cover flooding; that takes a separate flood policy. Second, a new flood policy generally has a 30-day waiting period before it takes effect. If you wait until a storm forms, it is too late for that storm. Chapter 13 explains flood insurance, and Chapter 2 covers reviewing your policies.

While you're at it, take photos or video of your belongings, room by room. It makes an insurance claim much easier later.

Supplies

Your basic kit (Chapter 5) and water and food (Chapters 3 and 4) cover most of what you need. For hurricanes, a few points stand out:

- Water. Ready.gov says one gallon per person per day for several days, for drinking and sanitation. CDC's hurricane guidance says store at least a 3-day supply for each person and each pet.
- Food. Keep a supply of food that needs no cooking, plus pet food.
- Medicines. Gather the prescription and over-the-counter medicines you might need.
- Cash. Card readers and ATMs need power.
- A battery or hand-crank radio, flashlights and extra batteries, and phone chargers that work without wall power.
- A paper list of important phone numbers, since the internet may be down.

Buy a little at a time through the spring. The week a storm is forecast, store shelves empty fast, and the lines for fuel and plywood get long.

Strengthen your home

NOAA lists a few steps that make a real difference:

- Trim trees near the house so branches don't become battering rams.
- Install hurricane shutters or impact glass, or buy plywood, steel or aluminum panels well before a storm comes.
- Seal openings in outside walls.
- Reinforce your garage door. Large garage doors are a weak spot in high wind.

Renters: talk to your landlord before the season about what they will do and what you may do. Write down what you agree on.

> **Tip:** Cut and label plywood panels for each window now, and store them with the screws or clips. On storm day, you'll be glad you don't have to measure in the wind.

When a storm is on the way

When a storm is forecast for your area, use the time in this rough order:

1. Check your zone and listen for evacuation orders from local officials.
2. Fill your car's gas tank and get cash.
3. Refill prescriptions you might run short on.

4. Bring in or tie down outdoor furniture, grills, trash cans and anything the wind can throw.
5. Put up shutters or panels.
6. Charge phones, power banks and radios.
7. Turn your fridge and freezer to the coldest setting and keep the doors closed (Chapter 4 covers food in an outage).
8. Put important papers in a waterproof bag and pack your go-bag.

Stay or go?

> **Caution:** Never ignore an order to evacuate. That is CDC's wording and mine. Officials can see the surge forecast for your street; you can't.

If you live in a surge zone and officials tell you to leave, leave. If you live in a mobile or manufactured home, plan to leave for any hurricane threat; the NWS says mobile homes are especially vulnerable to hurricane-force winds. If you need help evacuating, or depend on power for medical equipment, plan ahead with your local emergency management office and your care team.

You don't need to travel hundreds of miles, as the NWS puts it. Often it is enough to get out of the surge zone to a friend's house or a hotel on higher ground. Local officials will tell you which zones need to leave and where public shelters are open. Leave early, in daylight, before roads fill or flood.

If you are not ordered to leave and your home is sturdy, outside the surge zone and not prone to flooding, sheltering at home may be the right call. Chapter 7 covers that decision in more depth.

During the storm

If you are riding out the storm at home:

- Stay inside, in an interior room without windows. The NWS office in Newport/Morehead City, North Carolina, calls that the safest place you can be in a building, and says to put as many walls as possible between you and the outside.
- For extra protection from flying debris, you can cover yourself with a mattress and wear a helmet.
- If your house floods while you're in it, get higher in the house. Do not go into a closed attic, where you can be trapped. If the highest floor becomes dangerous, get on the roof and call 911.
- Keep your radio on and your phone charged. Listen for tornado warnings and flash flood warnings.
- If the wind suddenly goes calm, don't assume the storm is over. Stay inside until officials say it has passed.
- Do not use a generator, grill or camp stove indoors, even with the windows open.
- Don't drive into flooded areas. A car won't protect you from floodwater.

> **Caution:** If you are trapped by rising water, call 911. If 911 can't get through, keep trying and text if your area supports text-to-911 (Chapter 6).

After the storm

The NWS says nearly half of hurricane deaths happen after the storm. Dangers remain even after the skies turn blue. Slow down. You have been through a lot, and tired people make mistakes.

Coming home

Wait until officials say it is safe to return. When you go back, watch for washed-out roads, fallen trees and downed lines. CDC advises that if your home is damaged, you should not go back inside until a building inspector has checked it for safety.

> **Caution:** Never touch a fallen power line, and stay out of water that a line might be touching. Treat every downed line as live. Call the utility.

Carbon monoxide

Carbon monoxide (CO) is a poisonous gas you can't see or smell. It comes from engines and anything that burns fuel. After hurricanes, people get sick and die from running generators and grills in the wrong place.

- Keep a generator outside, at least 20 feet from any doors, windows or vents. Never run it inside your home, basement or garage, even with the windows and doors open.
- Use stoves and grills outside, away from windows and doors.
- The most common CO symptoms are headache, dizziness, weakness, nausea, vomiting, chest pain and confusion. If you suspect CO, get everyone into fresh air right away and call 911.

Chapter 10 covers generators in detail, and Chapter 9 covers CO alarms.

Floodwater and cleanup

The best way to protect yourself from floodwater is to stay out of it. It can hide sharp debris and live wires, and it can carry sewage and chemicals. If you have an open wound, avoid contact with floodwater.

For cleanup, wear rubber boots, rubber gloves and goggles. If you use a chain saw to clear trees, wear protective clothing and safety glasses, and don't use one unless you know how. Leave large trees on lines or houses to the utility and professionals.

Mold can start growing fast in a wet house. Air out rooms, dry what you can, and throw out items that can't be cleaned and dried quickly. CDC says if you clean with bleach, use no more than 1 cup of household laundry bleach in 1 gallon of water. CDC also says never to mix bleach with ammonia or any other cleaner, and never to use bleach in a closed space. Open windows and doors first (Chapter 20 covers household chemical safety). Before going into a building with mold damage, CDC advises a NIOSH-approved N95 respirator, a fitted mask rated by the National Institute for Occupational Safety and Health (NIOSH). Chapter 13 goes into flood cleanup and mold step by step.

Food and water

- Your tap water may not be safe. Use bottled, boiled or treated water for drinking, cooking and brushing teeth until local officials say the water is safe. Chapter 3 shows how to boil or disinfect water.
- Throw out food that touched floodwater or that got too warm in an outage. As CDC puts it, "When in doubt, throw it out!" Chapter 4 has the details.

Heat after the storm

Hurricanes often leave hot, humid weather and no air conditioning. Heat can get dangerous quickly; CDC notes that with heat stroke, body temperature can rise to 106 degrees F or higher within 10 to 15 minutes. Drink water, rest in shade, take cool showers if you can, and check on older neighbors. Chapter 18 covers heat illness.

Help with recovery

If you have questions about a FEMA disaster assistance application, Ready.gov lists 1-800-621-3362 and disasterassistance.gov. Chapter 26 walks through recovery, insurance claims and avoiding scams.

Special notes for your household

Kids

Kids pick up on adult stress. Give them a job during preparation (packing their own small bag, choosing a comfort toy), keep routines as much as you can, and keep them out of floodwater and cleanup work entirely.

Older adults and people with disabilities

Plan transportation early if you can't drive. If you rely on oxygen, dialysis, insulin or powered medical equipment, talk to your doctor and your utility before the season about a backup plan. Keep a written list of medicines, doses and doctors in your go-bag.

Pets

Plan where your pets will go before you need to leave. Not every shelter or hotel takes animals, so check ahead. Store water and food for each pet along with yours. Chapter 2 covers pet planning.

Renters

Your landlord's insurance won't protect your belongings, and renters insurance typically doesn't include flood. Flood coverage for your belongings is a separate policy (Chapter 13).

Mobile and manufactured homes

These homes are at high risk in hurricane winds. Plan to leave for a sturdier building for any hurricane threat, and know before the season where you will go.

Hawaii

Hawaii is in the Central Pacific season, June 1 to November 30. The same rules apply: know whether your home is in an inundation zone or flood zone, have supplies for your household, and follow county emergency officials. The Hawaii Emergency Management Agency has advised keeping at least 14 days of food, water and other supplies, since restoring ports, roads and power plants is likely to take two weeks or longer.

Quick checklist

- ☐ Look up your evacuation zone and write it down
- ☐ Plan two evacuation routes and a place to go, including for pets

- ☐ Check that you have flood insurance (30-day wait) and photograph your belongings
- ☐ Store water, no-cook food, medicines and cash for each person and pet
- ☐ Get shutters or pre-cut panels ready and trim trees near the house
- ☐ Keep a battery or hand-crank radio and power banks charged
- ☐ Never run a generator or grill indoors; keep it at least 20 feet from openings
- ☐ Never walk or drive through floodwater

Chapter 12: Tornadoes and Severe Thunderstorms

Thunderstorms are so common that most of us stop noticing them. Most pass with some rain and a few loud booms. A small share turn severe, with hail, damaging wind or tornadoes, and those can change a neighborhood in minutes. Unlike a hurricane, you may get only minutes of warning, not days.

That is why this chapter is about decisions made ahead of time. When the warning sounds, you shouldn't be wondering where to go. You should already know, and so should everyone in your home.

Where and when they happen

A tornado is a violently rotating column of air that reaches from the base of a thunderstorm down to the ground. The National Weather Service (NWS) says tornadoes have been reported in all 50 states. They are most common in the Central Plains and the southeastern United States, but no state is off the list.

They don't keep a schedule, either. The NWS says tornadoes can happen at any time of day or night and at any time of the year. At night you may be asleep, and you can't see a storm coming in the dark. That is one reason a loud alert on your phone or a weather radio matters so much (Chapter 6).

Severe thunderstorms happen across the country too. The NWS calls a thunderstorm severe when it can produce hail an inch or larger or winds of 58 mph or stronger. Severe storms can also cause flash flooding, which Chapter 13 covers.

Sizing up a tornado: the Enhanced Fujita scale

After a tornado, NWS teams survey the damage and give it a rating on the Enhanced Fujita (EF) scale. The scale has been in use since February 1, 2007. It runs from EF0 to EF5. The wind speeds are estimates, not measurements: three-second gusts worked out from the damage.

Rating	Estimated wind (mph)	NWS grouping
EF0	65 to 85	Weak
EF1	86 to 110	Weak
EF2	111 to 135	Strong
EF3	136 to 165	Strong
EF4	166 to 200	Violent
EF5	Over 200	Violent

You might ask, "Why does the rating matter to me?" Honestly, during the storm it doesn't. Ratings come after the fact. You can't know how strong a tornado is when the warning comes, so treat every tornado warning as a serious one.

The alerts and words you'll hear

Alert	What it means	What to do
Tornado Watch	Tornadoes are possible in and near the watch area. Watches often cover many counties or even several states.	Review your plan, check supplies and your shelter spot, keep alerts on.

Alert	What it means	What to do
Tornado Warning	A tornado has been sighted or shown by weather radar. Warnings cover a smaller area, roughly a city or small county.	Go to your shelter now.
Severe Thunderstorm Watch	Severe thunderstorms are possible in and near the watch area, which often covers many counties or even states.	Stay informed and be ready to act if a warning is issued.
Severe Thunderstorm Warning	Severe weather has been reported by spotters or shown by radar, and there is danger to life and property. Warnings cover a smaller area, roughly a city or small county, and usually last 30 to 60 minutes.	Take shelter in a sturdy building, away from windows. Get out of a mobile home.

Here is the simple way to remember it. A watch means "keep your eyes open." A warning means "move."

Signs a tornado may be coming

Alerts are your main defense, but you should also know what the NWS says to watch for:

- A dark, often greenish sky.
- A wall cloud, which is a lowered section of the base of a thunderstorm.
- A cloud of debris on the ground, even if you can't see a funnel.
- Large hail.
- A funnel cloud.
- A loud, roaring noise.

Don't wait to see one. Many tornadoes are hidden by rain or darkness. If a warning is issued for your area, go to shelter whether or not you see anything.

Before: get ready

You might ask, "Is all this really worth the trouble for something that may never hit my house?" Here's how I look at it. Most of the work is free, takes an afternoon, and covers you for every storm season after. You choose a spot, clear it, practice once or twice, and keep alerts turned on. That's not a big price for the minutes it can buy you.

Pick your shelter spot now

The NWS advice is to pick a safe room in your home where everyone, pets included, can gather during a tornado. The best choices, in order:

1. A storm shelter or safe room built for tornadoes.
2. A basement or storm cellar.
3. An interior room on the lowest floor with no windows, such as a closet, bathroom or inside hallway.

Walk through your home with this list today. Stand in the spot you chose. Is it away from outside walls and windows? Can everyone get there in less than a minute, including anyone who uses a wheelchair or walker? Is it clear, or is it stuffed with holiday boxes? Clear it now.

Tip: Keep a "shelter box" in your spot: sturdy shoes for everyone, a flashlight, a whistle, a battery or hand-crank radio, and bike or sports helmets if you have them. In the dark, after a storm, shoes matter.

Safe rooms

A safe room is a room specially designed and built to stand up to extreme wind and wind-blown debris, such as in a tornado or hurricane. It can be inside the house, attached to it, or a separate structure nearby, and the Federal Emergency Management Agency (FEMA) says it can provide near-absolute protection. FEMA publishes free guidance on building or installing one, called "Taking Shelter from the Storm" (FEMA P-320). If you live in tornado country and are building, remodeling, or have a mobile home on your land, ask your county emergency management office about safe room options. Some communities also have public storm shelters; learn where yours are and when they open.

Make a plan and practice it

The NWS recommends a family plan with a meeting place and shelter spaces, and practicing a tornado drill regularly so everyone knows what to do. Do your drill at different times of day. Ask your kids' school and your workplace where their tornado shelter areas are. Chapter 2 walks through making a family plan.

Have a plan for away from home

You won't always be home when a storm hits. Think through the places you spend time:

- Your workplace: where is the shelter area, and who calls the drill?
- Your kids' school or daycare: what is their plan, and what is their policy on picking kids up during a warning? Ask whether they keep students sheltered until the warning ends. To my mind that is safer than a parent driving into the storm.
- Stores, gyms, churches and ball fields you visit often: notice where the interior hallways and restrooms are.
- Your commute: know which sturdy buildings are along your route, such as a big store or a fire station, in case you need to get off the road.

Get alerts that will wake you

Make sure Wireless Emergency Alerts are on in your phone settings, and consider a NOAA Weather Radio with a battery backup and an alarm. The NWS notes that many communities have sirens meant only for outdoor warning. Don't count on hearing one inside, especially at night. Chapter 6 covers alerts.

During a tornado warning

Move fast. Every second counts.

At home or in a small building

Go to your basement, safe room or an interior room away from windows. Cover your head with your arms, a mattress or a heavy blanket. Bring pets if there's time.

Caution: Stay away from windows. Don't open them. Don't stop to film. The NWS warns that tornadoes can hurl objects through the air like deadly missiles.

In a mobile or manufactured home

The NWS is clear: mobile homes are not safe during tornadoes or severe winds. If a tornado watch is issued, think about where you'll go. If a warning is issued and you can reach a sturdy building, leave at once. Know your nearest sturdy shelter before storm season: a neighbor's house with a basement, a community shelter, a church or a store. Ask your park manager whether the park has a shelter.

At work, school or in a store

Follow your building's tornado plan and move quickly and calmly to the shelter area. Stay away from windows. Avoid large open rooms such as cafeterias, gyms and auditoriums, because wide roofs can fail.

Outdoors

Get inside a sturdy building right away if a tornado is coming. Sheds and storage buildings are not safe, and neither is a tent.

In a vehicle

There is no perfect answer here. The NWS says being in a vehicle during a tornado is not safe. Your best option is to drive to the closest sturdy shelter. If flying debris or traffic make that impossible, you have two last-resort choices:

- Stay in the car with your seat belt on, get down below the windows, and cover your head.
- Or, if you can safely get noticeably lower than the road, leave the car and lie in a ditch or ravine, covering your head.

Caution: Do not hide under a highway overpass. The NWS warns that overpasses are not a safe place, and people have been killed sheltering under them. Never drive toward a tornado.

Lightning

Lightning is the danger in every thunderstorm, severe or not. The NWS slogan says it best: "When Thunder Roars, Go Indoors!" There is no safe place outside when thunderstorms are in the area. If you can hear thunder, you are likely within striking distance.

Where it is safe

- Safe: a substantial building, such as a house, school or store, or a hard-topped vehicle.
- Not safe: rain shelters, small sheds and open vehicles. I'd add picnic shelters, tents, convertibles and golf carts to that list.

Indoors during a storm

Lightning can still reach you through a building's wires and pipes. The NWS advises:

- Stay off corded phones. Cell phones and cordless phones are safe to use.
- Stay away from anything plugged into an outlet, and from plumbing. To me that means no showers, baths or dishwashing until the storm passes.

- Stay away from outside doors and windows.
- Don't lie on a garage floor.

The 30-minute rule

Wait 30 minutes after the last lightning or thunder before going back outside. A storm moving away can still strike. Plan outdoor events, ball games and pool time with this rule in mind, and pick a safe building ahead of time.

If someone is struck

Call 911. Lightning victims do not carry an electrical charge and are safe to touch. If the person isn't breathing normally, start CPR (cardiopulmonary resuscitation) or use an AED (automated external defibrillator) if one is available. Chapter 8 covers CPR and AEDs, and I'd urge everyone to take a class.

Hail and damaging wind

Hail can damage roofs, vehicles and plants, and some severe storms produce hail larger than softballs. Severe thunderstorm winds can break off large branches and knock over trees, and some storms bring winds over 100 mph. These are called straight-line winds because they blow outward in one direction rather than spinning like a tornado. Straight-line wind damage, such as snapped and uprooted trees, is very common, and falling trees hit homes, cars, power lines and people.

A microburst is a sudden, strong burst of wind coming straight down out of the bottom of a storm and spreading out when it hits the ground. The NWS office in Birmingham, Alabama, notes they are common there with summer afternoon storms, especially on hot, muggy days.

A derecho is a very long-lived, damaging thunderstorm. The NWS counts a storm as a derecho when its wind damage path runs more than 240 miles, with gusts of at least 58 mph along most of it. Treat it like any severe thunderstorm warning, and be ready for a power outage afterward (Chapter 10).

What to do during a severe thunderstorm warning, based on NWS guidance:

- At home, go to your secure spot, the same one you'd use for a tornado if you like, and bring pets if there's time.
- At work or school, stay away from windows and avoid large open rooms such as cafeterias, gyms and auditoriums.
- If you're outside, go inside a sturdy building right away. Sheds and storage buildings are not safe, and taking shelter under a tree can be deadly.
- If you're in a vehicle, you are safer than being outside, but if there's time, head to the nearest sturdy shelter.

I'd add one thing of my own: if you have a garage, pull the car in when a watch is issued, not when the hail starts. Nobody should be running outside in a hailstorm to save a windshield.

A table to keep on the fridge

Where you are	Tornado Warning	Severe Thunderstorm Warning
House with a basement	Basement, away from windows; cover your head	Interior room away from windows

Where you are	Tornado Warning	Severe Thunderstorm Warning
House with no basement	Interior room, lowest floor, no windows	Interior room away from windows
Mobile home	Leave now for a sturdy building	Go to a sturdy building if you can do it safely before the storm hits
Apartment, upper floor	Move down to an interior hallway or stairwell on a low floor	Interior room away from windows
Work, school, store	Follow the building plan; avoid big open rooms	Stay away from windows; avoid big open rooms
Outdoors	Get into a sturdy building now	Get into a sturdy building now; not under a tree
In a vehicle	Drive to the nearest sturdy shelter; if you can't, stay buckled and get down, or get into a ditch	Safer than outside; head to shelter if there's time

After the storm

Once the warning has expired or the storm has clearly passed, check on your household, then your neighbors.

- If someone is hurt, call 911. If you are trained, give first aid until help arrives.
- Stay out of damaged buildings. Walls and roofs can fall.
- Stay away from downed power lines and report them to the utility. Treat every line as live.
- Watch for sharp metal, broken glass and nails in debris. Wear long pants, a long-sleeved shirt and sturdy shoes, and I'd add work gloves.
- If you smell gas, leave the building right away and notify the gas company, the police or the fire department. Chapter 9 covers gas shut-off.
- Never run a generator indoors or in a garage. Keep it outside, at least 20 feet from doors, windows and vents (Chapter 10).
- Take photos of damage before you clean up, for insurance (Chapter 26).
- More storms can follow, so keep your alerts on and your radio handy until the threat ends.

If your home is damaged, cover broken windows and roof holes with plastic sheeting or tarps only when it's safe to do so, and only from the ground or a stable spot. Roof work after a storm is a common way to get hurt. If there is any doubt, wait for a professional.

Special notes for your household

Kids

Make the drill a routine, not a scary event. Let kids help pick the shelter spot and pack the shelter box. Teach them the words "tornado warning" and what they mean. Ask the school about its plan so you know where your kids will be.

Older adults and people with disabilities

Think about how long it takes to get to the shelter spot. If stairs to a basement are hard, an interior ground-floor room may be the better choice. Keep a mobility aid, glasses, hearing aids and medicines near the bed during storm season. Ask a neighbor to check on you when warnings are issued.

Pets

Bring pets into the shelter spot with you if there's time. A crate or leash keeps a frightened animal from running off after the storm, when fences may be down.

Renters and apartment dwellers

Learn where your building's best shelter area is: often a lower-floor interior hallway or stairwell, away from windows. Ask your landlord. If you live on an upper floor, plan to move down when a warning is issued.

Mobile and manufactured homes

Plan ahead where you'll go. When a warning is issued, it is too late to start figuring it out.

Quick checklist

- ☐ Turn on Wireless Emergency Alerts and get a NOAA Weather Radio with battery backup
- ☐ Pick your shelter spot: basement, safe room, or interior room on the lowest floor with no windows
- ☐ Clear the shelter spot and keep shoes, a flashlight and a radio there
- ☐ Practice a tornado drill with everyone in your home
- ☐ Mobile home residents: choose a sturdy building to go to when a warning is issued
- ☐ Know the difference: watch means get ready, warning means take shelter now
- ☐ Follow the 30-minute rule after the last thunder
- ☐ Never shelter under a highway overpass

Chapter 13: Floods

Floods are the disaster most of us underestimate. The water looks calm. The road looks passable. The creek behind the house has never come up that high before. Then it does. FloodSmart, the official site of the National Flood Insurance Program, calls flooding America's most common and costly natural disaster.

The good news is that flood safety comes down to a few habits you can learn in one sitting: know your risk, get the right insurance early, get to higher ground when told, and never drive or walk into floodwater. This chapter covers those, plus how to come home and clean up safely.

Where floods happen

Short answer: almost everywhere. The National Weather Service (NWS) says flooding threatens some part of the United States nearly every day of the year. FloodSmart reports that since 1996, 99% of U.S. counties have been impacted by flooding.

You don't have to live on a river or near the ocean. Heavy rain on pavement, a clogged storm drain, a dam upstream or a burned hillside can all send water where it has never gone before. Ready.gov puts it plainly: flooding doesn't follow lines on a map. Chapter 1 shows how to look up your flood risk, including on the Federal Emergency Management Agency (FEMA) Flood Map Service Center.

Types of flooding

The NWS describes several kinds of floods. Knowing which ones can reach you tells you what to watch for.

Type	What it is
Flash flood	Fast flooding that generally develops within 6 hours of heavy rain or another cause. A mountain creek 6 inches deep can rise to 10 feet in less than an hour.
River flood	River levels rise and overflow their banks, covering land that is normally dry.
Coastal flood and storm surge	Sea water pushed onto land, usually by a tropical storm or hurricane. Surge can travel several miles inland (Chapter 11).
Inland flooding from tropical storms	Heavy rain from a tropical system, often far from the coast. The NWS says it has caused more than half of tropical cyclone deaths since the 1970s.
Burn scar flooding and debris flows	After a wildfire, burned ground can't soak up rain. Fast-moving mud, rock and debris can destroy homes and wash out roads (Chapter 14).
Ice jams	River ice piles up and blocks the flow. Water backs up behind it, and when the jam breaks, flash flooding can hit downstream.
Snowmelt	Melting snow adds water to rivers, sometimes for weeks.
Dry wash	A storm miles away sends water rushing down a dry streambed where it isn't raining at all.
Dam or levee failure	A dam or levee breaks, often with little warning. The NWS counts more than 80,000 dams in the United States.

You might ask, "If it isn't raining where I am, am I safe?" Not always. Dry washes, dam releases and rivers carrying rain from upstream can flood you under a blue sky. Pay attention to alerts, not just the sky.

The alerts and words you'll hear

Alert	What it means	What to do
Flood Advisory	A forecast weather event may cause flooding that becomes a nuisance.	Be aware. Use caution.
Flood Watch	Conditions are favorable for flooding. It isn't certain, but it's possible.	Be prepared. Review your plan and know your route to high ground.
Flood Warning	Flooding is happening or about to happen.	Take action.
Flash Flood Warning	A flash flood is happening or about to happen.	Act now. If you're in a flood-prone area, move to higher ground immediately.

Chapter 6 covers how to get these alerts on your phone and a NOAA Weather Radio. If you live near a river or creek, the NWS flood safety page points to an interactive flood map on NOAA's National Water Prediction Service, at water.noaa.gov.

Turn Around Don't Drown

This is the single most important part of the chapter. According to an NWS page citing the Centers for Disease Control and Prevention (CDC), over half of all flood-related drownings happen when someone drives into dangerous floodwater. Many of those deaths are in cars swept downstream.

It takes far less water than most people think:

Moving water depth	What it can do
6 inches	Knock over and carry away an adult
12 inches	Carry away a small car
18 to 24 inches	Carry away most large SUVs, vans and trucks

And you can't see what's under the surface. The road itself may have collapsed under the water. Floodwater also hides holes, debris and downed power lines.

Caution: Never walk, swim or drive through floodwater. Never drive around barriers blocking a flooded road. Turn around and find another way. As the NWS says, "Turn Around Don't Drown."

Tip: Know two routes out of your neighborhood to higher ground, and drive them once in good weather. In a flood, the familiar low spot on your usual road may be the one that's under water.

Flood insurance

Here is something many people learn the hard way. Ready.gov says homeowners policies don't cover flooding, and FloodSmart notes that both homeowners and renters policies typically do not cover flooding from natural disasters. Flood coverage is a separate policy.

What you need to know

- **Waiting period.** FloodSmart says National Flood Insurance Program (NFIP) policies generally have a 30-day waiting period before they take effect. If you wait until rain is in the forecast, it is too late. Buy it well before you need it.
- **Low-risk doesn't mean no-risk.** FloodSmart says nearly one-third of NFIP claims come from outside high-risk flood areas.
- **It covers building and belongings.** FloodSmart says NFIP policies protect both your building and your belongings. Ask your agent which coverage you need.
- **Renters can protect their things.** If you rent, your landlord's insurance won't protect your belongings, and renters insurance typically doesn't include flood. FloodSmart says renters can buy contents-only flood coverage for up to $100,000 of their belongings.
- **Disaster aid is not insurance.** FloodSmart notes that federal disaster assistance is only available after a presidential disaster declaration.

You can get a quote through an insurance agent or online at floodsmart.gov. Chapter 2 covers reviewing all your insurance.

Before: get ready

Protect your home

Ready.gov and other official sources suggest some simple steps. Most are cheap or free.

- Clear gutters, downspouts and nearby storm drains so water can drain away.
- Move valuables, important papers and anything you can't replace to upper floors or high shelves.
- If you have a sump pump, consider a battery backup so it keeps running when the power goes out.
- Keep important documents in waterproof containers, and keep secure, password-protected digital copies.
- If you own your home and are in a high-risk area, ask your local building or floodplain office about raising your furnace, water heater and electrical panel above likely flood levels.

Learn where your main electrical panel, water shutoff and gas valve are, and how each one works, before water is anywhere near them. Chapter 9 walks through each shutoff. In a flood, you want to know this cold, not be reading labels with a flashlight while water creeps across the basement floor.

Plan and supplies

Make a household plan that includes your pets, and practice your evacuation route. Keep several days of water, food and cleaning supplies. Ready.gov says to store one gallon of water per person per day for several days, for drinking and sanitation. Chapters 3 to 5 cover water, food and kits, and Chapter 7 covers evacuation.

Sign up for your community's warning system (Chapter 6). Flash floods leave little time, so alerts that wake you up at night matter.

Camping, hiking and canyon country

Flash floods are a special danger for anyone outdoors near creeks, canyons and dry streambeds. Remember the NWS example: a mountain creek about 6 inches deep can swell to 10 feet deep in less than an hour. And with a dry wash, the storm causing the flood can be miles away.

- Check the forecast for the whole area upstream, not just where you'll be, before you head out.
- Don't camp or park right next to a stream or in a dry streambed.
- If you hear rushing water or see the water rising or turning muddy, climb to higher ground right away. Don't try to cross.

Northern winters and spring thaw

If you live in a cold-weather state, your flood season may start in late winter. Snowmelt can keep rivers high for weeks, and ice jams can back water up fast. The NWS notes that ice six inches thick can destroy large trees and knock houses off their foundations, and that when a jam breaks, flash flooding can hit downstream. If you live along a river that freezes, pay attention to river forecasts and flood watches during thaws, and don't go out on river ice to look at a jam.

A quick word on insurance doubts

You might ask, "My lender doesn't require flood insurance, so do I really need it?" That's your call, but here's how I'd think about it. FloodSmart estimates that just 1 inch of floodwater can cause up to $25,000 in damage to an average-size home. Disaster aid, if it comes at all, requires a presidential disaster declaration first. Get a quote, look at the price, and decide with real numbers in front of you.

During a flood

When a Flood Warning or Flash Flood Warning is issued, act. In order of priority:

1. If officials tell you to evacuate, go. Don't wait to see how bad it gets.
2. If you're in a flood-prone area during a Flash Flood Warning, move to higher ground immediately. Don't stop to pack more than your go-bag.
3. Stay out of floodwater. Don't walk, swim or drive through it, and stay off bridges over fast-moving water.
4. If you are trapped in a building, go to the highest level. Don't climb into a closed attic, where rising water can trap you. Go onto the roof only if you must, and signal for help.
5. If you have a medical emergency, call 911.

If your car is caught

> **Caution:** If your car is trapped in fast-moving water, Ready.gov says to stay inside the car. If water is rising inside the car, get out onto the roof.

The best plan is never to be in that spot. If you see water over the road, stop and turn around. I'd be extra careful after dark, when it's hard to tell how deep water is.

After a flood

More people get hurt after a flood than many expect, from electrical shock, carbon monoxide, falls and dirty water. Take it slow.

Returning home

Return only when local officials say it is safe. Avoid driving except in emergencies, since roads may be damaged. CDC advises: if your home has damage, don't go back in until a building inspector has checked it for safety.

> **Caution:** If you smell gas or suspect a leak, CDC says to turn off the main gas valve, open all windows and leave the house right away. Then notify the gas company, the police or the fire department.

Electricity and water don't mix

- Never turn power on or off, or use an electric tool or appliance, while standing in water.
- If you would have to wade through standing water to reach the main power switch, call an electrician to turn it off.
- Have an electrician check your electrical system before turning the power back on.
- Let all electrical equipment and appliances dry completely before using them.
- Use battery-powered flashlights and lanterns, not candles.
- Stay away from downed power lines and any water they might touch.

Carbon monoxide from pumps, generators and pressure washers

Cleanup often means running gas-powered pumps, generators and pressure washers. All of them make carbon monoxide (CO), a poison gas you can't see or smell.

> **Caution:** Never run a gasoline engine inside a home, basement, garage, carport or porch. CDC says to keep it at least 20 feet from any door, window or vent, even with windows and doors open. Chapter 10 covers generators, and Chapter 9 covers CO alarms.

Floodwater is dirty water

Floodwater can carry sewage, chemicals and debris, and CDC notes a flooded home may be contaminated with sewage.

- Stay out of floodwater as much as you can. If you have an open wound, avoid contact with it.
- Wear rubber boots, rubber gloves and goggles during cleanup.
- Wash your hands with soap and clean water after cleanup and before eating.
- Keep children and pets out of the water and away from cleanup work. Ready.gov says children should not do cleanup work.
- Watch for snakes and other animals that may have moved into your home.

Drinking water and wells

Your tap water may not be safe after a flood. Use bottled, boiled or treated water for drinking, cooking, washing dishes and brushing teeth until officials say tap water is safe. Chapter 3 shows how to boil or disinfect water.

If you have a private well and live in a flooded area, CDC says to get your water tested before you use it. Contact your local or state health department about testing.

Food

Throw out any food that touched floodwater, and food that got too warm in a power outage. When in doubt, throw it out. Chapter 4 has details.

Drying out and mold

Mold can start in a wet house quickly, and it can make people sick, especially those with asthma or other lung problems.

1. Open doors and windows to air out a closed-up house for at least 30 minutes before you stay inside, if weather allows.
2. Dry everything as soon as you can. Put fans in windows or doors blowing outward, so they don't spread mold through the house.
3. If your heating and air conditioning system got wet, don't turn it on until it has been checked. Running a flooded system can spread mold through the house.
4. Throw out items that can't be cleaned and dried quickly. CDC says to try to clean up and dry your home within 24 to 48 hours if you can.
5. If you clean hard surfaces with bleach, CDC says to use no more than 1 cup of household laundry bleach in 1 gallon of water. CDC says never to mix bleach with ammonia or any other cleaner, and never to use bleach in a closed space. Open windows and doors first (Chapter 20 covers household chemical safety).
6. Wear an N95 respirator, a fitted mask approved by the National Institute for Occupational Safety and Health (NIOSH), when working around mold.

CDC also says that if your home was flooded and closed up for several days, assume it has mold.

> **Caution:** People with asthma or other lung conditions, or with weakened immune systems, should stay out of buildings with mold or water leaks, according to Ready.gov. Let others do the cleanup.

Getting help

Take photos and video of damage before you throw things out; your insurance company will want them. For questions about FEMA disaster assistance, Ready.gov lists 1-800-621-3362 and disasterassistance.gov. Chapter 26 covers recovery, claims and avoiding scams.

Special notes for your household

Kids

Floodwater looks like a giant puddle to a child. Keep kids away from creeks, ditches and storm drains during and after heavy rain, and keep them out of cleanup.

Older adults and people with disabilities

Plan your route to higher ground and who will help you get there. Keep medicines, medical devices and chargers on an upper floor or in your go-bag. Tell a neighbor or relative your plan.

Pets

Bring pets with you when you leave. Don't let them drink or play in floodwater. Rinse them off with clean water if they get into it.

Renters

Remember that your landlord's insurance does not cover your belongings. Ask your landlord how the building is protected, where shutoffs are, and what they expect you to do in a flood.

Mobile and manufactured homes

Low-lying parks can flood fast. Know your route to higher ground and leave early when officials say to.

Quick checklist

- ☐ Look up your flood risk on the FEMA Flood Map Service Center (Chapter 1)
- ☐ Buy flood insurance now; NFIP policies generally take 30 days to start
- ☐ Sign up for local alerts and know a Flood Watch from a Flash Flood Warning
- ☐ Plan two routes to higher ground and drive them once
- ☐ Keep documents in a waterproof container and valuables up high
- ☐ Never walk, swim or drive through floodwater: Turn Around Don't Drown
- ☐ After a flood, wait for officials, keep generators and pumps 20 feet from openings, and test your well

Chapter 14: Wildfires and Smoke

This chapter covers two problems that travel together. The first is the fire itself: a wildfire moving toward homes, roads and towns. The second is the smoke, which can drift well beyond the fire and make the air unhealthy for people who never see a flame.

Many households will deal with smoke more often than with fire at the door. So I'll walk you through both. You'll learn how to make your home harder to burn, how to get out early, how to keep the air inside your home cleaner on smoky days, and how to clean up safely afterward.

Living in northern Nevada, wildfire season and summer smoke are part of life. When smoke settles into the valley for days, you find out fast whether your home is sealed and whether you have spare air filters. Keep important papers, medications and go-bags ready to load on short notice.

What a wildfire is and where it happens

A wildfire is an unplanned fire that burns through grass, brush or forest. Wildfires are best known in the western states, but dry grass, brush and woods can burn in many parts of the country. Chapter 1 shows you how to look up the wildfire risk where you live.

Weather sets the stage. Hot, dry air and strong wind dry out plants and push flames along. Wind also carries embers. Embers are burning bits of bark, leaves and wood that blow ahead of the fire. The National Weather Service (NWS) warns that sparks or embers can blow into leaves or grass, start a fire and spread fast. That's why so much of this chapter is about clearing the small stuff that burns: dry leaves, needles, dead plants and clutter near your walls.

The alerts and words you'll hear

The NWS issues fire weather alerts when the weather sets up for fast-spreading fires. Your local fire agencies and emergency managers issue evacuation orders. Learn the words before you need them.

Term	What it means for you
Fire Weather Watch	NWS alert: critical fire weather conditions are possible. A heads-up to get ready.
Red Flag Warning	NWS alert: warm temperatures, very low humidity and stronger winds are expected to combine and raise the risk of fire danger. Don't burn anything outdoors. Be ready to leave.
Evacuation order or warning	Issued by local officials, not the weather service. The exact names differ from place to place. Learn the terms your county uses.
Air Quality Index (AQI)	A number from 0 to 500 that tells you how clean or polluted the air is. Higher means more pollution.

On a Red Flag Warning day, the NWS warns, sparks or embers can start a fire that spreads quickly. I'd skip the burn barrel and the campfire that day, and check whether your area has banned outdoor burning. The NWS says never to throw cigarettes or matches out of a moving vehicle. When you put out any outdoor fire, the

NWS says to drown it with plenty of water and stir it until everything is cold to the touch. Never leave a fire unattended.

Before: get ready

Know how you'll hear about a fire

Sign up for your county or city emergency alerts, and turn on emergency alerts on your phone. Chapter 6 covers alerts in detail. During fire season, keep your phone charged and nearby at night.

The Centers for Disease Control and Prevention (CDC) suggests you keep an eye on fires in your area with fire mapping tools. AirNow, the air quality site run by the U.S. Environmental Protection Agency (EPA) and its partners, has a Fire and Smoke Map at airnow.gov that shows both fires and air quality.

Ready, Set, Go!

You may hear your fire department talk about "Ready, Set, Go!" The International Association of Fire Chiefs (IAFC) offers it as a personal wildfire action guide that local fire departments can hand out. The guide's aim is to help you prepare for a wildfire threat, stay aware when a fire starts, and act early as directed by local officials. I like it because it's simple: get ready now, pay attention when a fire starts, and go early.

Ask your local fire department whether it has a version for your area. The IAFC says some departments have customized the guide for their area and added local contact information.

Make a wildfire plan

Your family plan from Chapter 2 is the base. Add these wildfire pieces:

- At least two ways out of your neighborhood. Fire can close a road fast. Drive both routes before fire season.
- A place to go: a friend or relative outside the fire area, a hotel, or a public shelter. Chapter 7 covers evacuation and shelters.
- A plan for pets and large animals. The CDC notes that some evacuation centers do not accept animals. Line up a pet-friendly place ahead of time.
- A go-bag for each person, ready by the door during fire season. Chapter 5 lists what goes in it.
- N95 respirators for the adults and older children in your home. More on these in the smoke section below.

The NWS suggests you plan escape routes and make sure everyone living in the home knows the plan. It also suggests checking emergency equipment, such as flashlights and generators, ahead of time. Practice the plan. A plan nobody remembers is just a piece of paper.

Make your home harder to burn

You can't fireproof a house. You can make it less likely to catch from embers and nearby flames. The idea is called defensible space: the area around your home where you have cleared or cut back the things that burn. It gives your home a better chance, and it gives firefighters a safer place to work.

California's state fire agency, the California Department of Forestry and Fire Protection (CAL FIRE), teaches three zones measured out from your home. Other states use similar ideas, so check with your state forestry agency or local fire department for the rules where you live.

Zone	Distance from the home	What to do
Zone 0 (ember-resistant)	First 5 feet	Use hard surfaces like gravel, pavers or concrete instead of bark or wood mulch. Remove dead plants, weeds, leaves and needles from the roof, gutters, deck, porch and stairs and from under the house. Remove branches within 10 feet of a chimney or stovepipe. Move firewood and lumber out to Zone 2. Replace wood fences, gates and arbors attached to the house with ones that don't burn.
Zone 1 (lean, clean and green)	Within 30 feet	Remove dead plants, grass and weeds, and dead or dry leaves and pine needles. Trim trees so branches stay at least 10 feet from other trees. Leave space between trees, shrubs and things that can burn, like patio furniture, wood piles and swing sets.
Zone 2 (reduce fuel)	Within 100 feet, or to your property line	Cut or mow annual grass down to no more than 4 inches. Leave space between shrubs and trees, both side to side and from the ground up. Keep 10 feet of clearance around exposed wood piles, outbuildings and propane tanks.

CAL FIRE calls the first 5 feet the most important part. If you only have one free Saturday, spend it there. Clean the gutters and the roof, rake out under the deck, and pull anything that burns away from the walls: doormats, stacked boxes, patio cushions, the recycling bin and the firewood pile.

The NWS also suggests fire-resistant landscaping and fire-safe building methods. If you're replacing a roof, siding, deck or fence anyway, ask your local fire department or building office what materials they recommend for your area. That's the cheapest time to make a big upgrade.

Embers are a big reason homes catch fire. The U.S. Fire Administration (USFA) says embers contribute to a significant percentage of home ignitions, that wind can carry them several miles, and that they can get inside through a window or vent. Two of its suggestions are easy places to start: replace window screens with metal screens, and caulk or seal openings in the house.

Some counties and homeowners associations have their own clearance rules and plant lists. Check your state and local rules before you cut big trees, and hire a qualified tree service for anything tall or near power lines.

Get ready for smoke

Even if you never face a fire, smoke may reach you. The EPA suggests some steps before smoke season:

- Have a supply of N95 respirators approved by the National Institute for Occupational Safety and Health (NIOSH), and learn how to use them.
- Set up a "cleaner air room" in your home, and have a portable air cleaner ready to use in that room when smoke arrives.
- If you have central heating and air, ask a heating and air conditioning professional what kind of high-efficiency filters your system can use.

- Stock up so you don't have to go out when it's smoky. The EPA suggests having several days of food and medicines on hand.
- If you have heart or lung disease, the EPA says to make a plan with your doctor or other health care provider for managing it. Do it now, before the air turns bad.

During: when a wildfire threatens

If officials say leave, leave

This is the most important rule in this chapter. The CDC says to always follow the instructions of local emergency management officials. If they tell you to evacuate, go right away. The NWS says to leave immediately when asked, to avoid being caught in fire, smoke or road congestion. Officials can see where the fire is heading and how fast. You can't.

You might ask, "Should I wait until I can see the flames?" No. You don't need an order to leave. The CDC notes that you may be asked to evacuate, or you may decide to evacuate on your own. If you feel unsafe, or you have kids, older adults, pets, livestock or someone with a breathing problem in your home, leave early. Leaving early is the whole point of "Go" in Ready, Set, Go!

Leaving in order

1. Grab your go-bags, medicines, phone and charger, glasses and important papers.
2. Load pets, with carriers and leashes.
3. Put on long sleeves, long pants and sturdy shoes, and an N95 respirator if it's smoky.
4. Tell your out-of-area contact where you're going.
5. Drive the route officials give you, or your planned route if they haven't named one.
6. In smoke, keep the car windows closed, set the air to recirculate, and slow down when it's hard to see. That's the EPA's advice for driving in smoke.

Caution: Never drive toward a fire to look at it, and never ignore a road closure. Follow the route officials give you, even if it's longer.

If you're told to stay inside

Sometimes officials will tell people to stay put, because roads are blocked or because the fire is far enough away that smoke is the main problem. The CDC says to stay inside if authorities tell you to. Close windows and doors, and keep listening to local alerts.

Smoke: protecting your lungs

Why smoke matters

The CDC notes that wildfire smoke irritates your eyes, nose, throat and lungs. Healthy adults may just feel a scratchy throat and burning eyes. For some people, smoke can be much more serious.

The EPA names the people at greater risk from smoke: people with heart or lung disease, older adults, children, pregnant women, and people who breathe in more smoke than most because of where they are or what they do. If someone in your home is on that list, plan to act sooner and do more.

Reading the Air Quality Index

The AQI is the EPA's index for reporting air quality. It runs from 0 to 500. Higher numbers mean more pollution and more health concern. The EPA says that when the AQI is above 100, air quality is unhealthy, at first for sensitive groups and then for everyone as the number climbs. Each range has a color, so you can tell at a glance. The descriptions in the last column are the EPA's own words.

Color	Level of concern	Values of index	Description of air quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

To check the air where you are, the CDC suggests entering your location at airnow.gov or checking your phone's weather app.

Make the air inside cleaner

Staying inside is your best protection, as long as you keep the air inside cleaner than the air outside. Here's how, based on EPA and CDC guidance:

- Close windows and doors. If your heating and air system has a fresh air intake, close it or set the system to recirculate.
- Use the best filter your system can take. The EPA says to use MERV 13, or as high as your system can handle. MERV stands for Minimum Efficiency Reporting Value, a rating for how well a filter catches particles. Higher catches more.

- Use a portable air cleaner in your cleaner air room. The EPA says to pick one powerful enough for the room's size that produces little or no ozone (a gas that irritates the lungs).
- Don't add more pollution indoors. The CDC says to avoid burning anything indoors as much as you can, including candles, gas, propane, incense or wood. The EPA adds smoking and vaping to the list, and suggests going easy on stove and oven cooking, especially at high heat or for a long time.
- Vacuum only if your vacuum has a HEPA filter. HEPA stands for high-efficiency particulate air, a type of filter that traps very fine particles.
- When the air quality improves, open the windows and air the place out.

You might ask, "What if I can't afford an air cleaner?" The EPA says you can make a do-it-yourself air cleaner using a box fan and one or more high-efficiency furnace filters. The EPA suggests a filter rated MERV 13 or higher.

Caution: If you build a box fan air cleaner, the EPA says to use a newer box fan (built in 2012 or later) with a UL or ETL safety marking (from product safety testing labs), since older fans may pose fire risks. Don't use an extension cord or a damaged fan, don't leave children unattended while it runs, and make sure you have working smoke alarms in the home.

If it's hot and you don't have air conditioning, you have a hard choice. The EPA says that if you must open windows to cool down, close them once the inside is cooler and use an air cleaner. If you can't stay cool with the windows shut and the smoke is getting to you, the EPA says to find shelter somewhere else. Heat can be as dangerous as smoke. Chapter 18 covers heat.

N95 respirators: what works and what doesn't

If you have to go outside when it's smoky, a well-fitted respirator helps. A respirator is a face covering built to filter tiny particles and seal tightly to your face. The EPA says to keep NIOSH-approved N95 respirators on hand and learn how to use them. The CDC says an N95 or P100 is the most protective, and that it must fit tightly and be worn correctly.

A respirator only works if air goes through the filter, not around the edges. AirNow says to look for the words "NIOSH" and "N95" printed on it, and it warns that cloth masks will not protect you from ash.

Caution: The EPA says not to rely on dust masks or bandanas for protection from smoke.

Kids are trickier. The CDC says children ages 2 and older can wear respirators and masks, as long as the fit covers the nose and goes under the chin without blocking their vision. For young kids, the best plan is to keep them inside in your cleaner air room.

Know the warning signs

The CDC says to get medical help for any new or worsening symptoms, especially if you have asthma, chronic obstructive pulmonary disease (COPD), heart disease or diabetes, or you're pregnant. If it feels like an emergency, call 911.

After: returning and cleaning up

Going home

Wait until officials say it's safe to go back. Burned areas can hide dangers you won't see from the car. Chapter 26 covers the full return-home safety check and insurance steps.

The CDC notes that large fires can cause long-term power outages. Plan for no power, water problems and spoiled food. Chapter 10 covers outages, and Chapter 4 covers food safety.

AirNow warns that cleanup work can expose you to ash and other fire leftovers that may be harmful. It also says to look for leaking containers and reactive household chemicals, like drain cleaner and bleach.

Cleaning up ash safely

The EPA describes ash as large and tiny particles of dust, dirt and soot. Stirred-up ash is easy to breathe in. Here's the EPA's guidance, in plain terms:

- People with heart or lung disease, older adults and pregnant women should not take part in ash cleanup.
- Children should not be near ash or places with ash on them. AirNow adds that children should not help with cleanup or play in ash.
- Wear work gloves, long sleeves, long pants, socks and sturdy, thick-soled shoes so ash doesn't touch your skin.
- Wear a close-fitting respirator that filters ash particles.
- Avoid stirring up or sifting through ash as much as you can.
- Never use a leaf blower.
- Before you sweep hard surfaces inside or out, mist them with water to keep dust down. Use as little water as you can.
- Use a HEPA vacuum if you have one. If you must use a regular household vacuum or a shop vacuum, wear a respirator, air out the space, and run an air cleaner or your system's filter while you work.
- Wash clothing, bedding and curtains that have ash on them.
- Clean ash off toys before kids use them. Clean ash off pets and keep them away from ashy areas.
- Wash fruits and vegetables from trees or gardens where ash fell.

AirNow also suggests replacing the filters in your heating and air system or portable air cleaner, and filtering your air until the smoke smell fades.

> **Caution:** If your home burned, be extra careful. The EPA says ash from burned buildings generally contains more harmful chemicals than ash from a forest fire, and it says to get professional help if you find structural damage or hazardous materials. Don't dig through burned debris until local officials tell you how to do it safely.

Floods and debris flows after a fire

A fire changes the land. The U.S. Geological Survey (USGS) explains that after a fire, plants are gone and the soil changes, so the ground can't soak up rain the way it did. On steep burned slopes, that can set off a debris flow: a fast-moving mix of water, mud, rocks and plants that the USGS says can surge downhill like flowing concrete.

The USGS says these flows are usually set off by short bursts of heavy rain, and they can happen during the very first storm after a wildfire. Even modest storms can trigger them. They often move faster than a person can run, and they can travel well beyond the burned area.

> **Caution:** If you live below a burned hillside or near a channel that drains one, take flash flood and debris flow alerts seriously, and leave early when officials say to. Don't wait to see mud coming. You won't be able to outrun it.

Chapter 13 covers floods, and Chapter 16 covers landslides and debris flows in more detail.

Special notes

Kids

Keep children inside in your cleaner air room on smoky days, and keep them away from ash. Pack a comfort item in each child's go-bag. Explain the plan in simple words before fire season: "If the fire people tell us to go, we all get in the car together."

Older adults and people with disabilities

Smoke hits older adults and people with heart or lung disease harder. If you or someone you help uses oxygen or other power-dependent equipment, plan for power outages and for leaving early. Ask a neighbor to check on you, and check on older neighbors yourself.

Pets and livestock

Pets breathe smoke too. Bring them inside on smoky days. If you have horses or livestock, leaving takes longer, so move them early. Chapter 2 covers pet plans.

Renters

You may not control the yard, but you can keep your own porch, patio and balcony clear of things that burn, and ask your landlord about gutters and brush. Renters insurance can help if you lose your belongings. Chapter 2 covers insurance.

Mobile and manufactured homes

Clear under and around the home. CAL FIRE's Zone 0 advice includes clearing leaves and debris from under any part of a home, and that matters even more when the space under the floor is open. Leave early when officials give the word.

Quick checklist

- ☐ Sign up for local emergency alerts and turn on phone alerts.
- ☐ Learn your county's evacuation terms and know two ways out.
- ☐ Clear the first 5 feet around your home and clean your gutters and roof.
- ☐ Keep a go-bag by the door during fire season for each person and pet.
- ☐ Buy NIOSH-approved N95 respirators and practice putting them on.

- ☐ Pick a cleaner air room and get an air cleaner or the parts for a DIY one.
- ☐ Find out the best furnace filter your system can take (MERV 13 if it can).
- ☐ Bookmark airnow.gov and check the AQI on smoky days.
- ☐ Keep several days of food and medicine so you can stay in when it's smoky.

Chapter 15: Earthquakes

Earthquakes are different from most hazards in this book. There's no forecast, no watch, no evacuation order the day before. The ground just starts moving. That means almost everything you do to stay safe has to be done ahead of time, and the few seconds of shaking come down to one simple move you practice until it's automatic.

This chapter covers where earthquakes happen in the United States, the safest thing to do when the shaking starts, how to make your home safer before it does, and what to expect after. If you live near the coast, read Chapter 16 too, because a strong earthquake there can bring a tsunami.

What an earthquake is and where it happens

An earthquake is a sudden shaking of the ground caused when rock underground breaks and slips along a fault. A fault is a crack in the earth's crust where the rock on each side can move. Most earthquakes are too small to feel. A few are strong enough to topple furniture, break pipes and damage buildings.

You might think of earthquakes as a California problem. They're a much wider problem than that. In 2024 the U.S. Geological Survey (USGS), the federal science agency that tracks earthquakes, released a national map showing that nearly 75 percent of the U.S. could experience damaging earthquake shaking. The USGS also notes that 37 states have had earthquakes larger than magnitude 5 in the last 200 years. Magnitude is the number that describes an earthquake's size at its source.

The USGS map points out a few areas in particular:

- California and Alaska, which are very active and have a chance of even stronger shaking.
- Hawaii, which the new model rates as having greater potential for shaking, based on observations from recent volcanic eruptions and seismic unrest.
- The central and northeastern Atlantic coast, including Washington, D.C., Philadelphia, New York and Boston, where the model shows the possibility of more damaging earthquakes.

Other USGS pages point to more places to know about:

- The Intermountain West, a region that includes states such as Nevada, Utah, Idaho and Montana. The USGS keeps a list of high-priority hazardous faults there.
- The New Madrid seismic zone, which runs through northeastern Arkansas, southwestern Kentucky, southeastern Missouri and northwestern Tennessee. Its 1811-1812 earthquakes were estimated at magnitude 7 to 8, and the USGS says a continuing concern exists for a major destructive earthquake there.
- South Carolina, where a USGS study estimates the 1886 Charleston earthquake at about magnitude 7.

You might ask, "I live back East. Do I really need this chapter?" It's a fair question. Your odds may be lower than in Alaska, but they aren't zero. The good news: the steps in this chapter are cheap, and most of them are about fastening things down, which makes a home safer for kids and pets anyway.

Chapter 1 shows how to look up hazard maps for your own area.

The words you'll hear

Term	What it means
Fault	A crack in the earth's crust where the rock on each side can move.
Magnitude	A number that describes the size of an earthquake at its source. Bigger number, bigger earthquake.
Aftershock	A smaller earthquake that follows a larger one in the same area. FEMA says aftershocks can continue for weeks or even months.
Drop, Cover, and Hold On	The recommended way to protect yourself during shaking.
ShakeAlert	The USGS earthquake early warning system. It can send alerts to phones in California, Oregon and Washington before strong shaking arrives.

Before: get ready

Secure your space

A big part of the danger in an earthquake is things falling, sliding and breaking: bookcases, televisions, mirrors, appliances and glass. The single best thing you can do this weekend is walk through your home and ask, "What could fall on someone, or block the way out?"

Call it a hazard hunt. The Federal Emergency Management Agency (FEMA) earthquake safety checklist names the things to look for:

- Tall, heavy furniture that could tip over, like bookcases, china cabinets and wall units.
- Water heaters that could be pulled away from their pipes and break open.
- Appliances that could move far enough to break gas or electrical lines.
- Hanging plants in heavy pots that could swing off their hooks.
- Heavy picture frames or mirrors over a bed.
- Cabinet latches that won't hold the doors shut during shaking.
- Breakable or heavy things on high or open shelves.
- Flammable liquids, like paint and cleaning products, which FEMA says are safer in a garage or outside shed.

FEMA's advice is to fix these hazards by securing or moving the heavy items. In plain terms:

- Fasten tall furniture to the wall studs with straps or brackets made for the job.
- Strap the water heater to the wall.
- Move heavy and breakable things to low shelves.
- Put latches on kitchen cabinets that hold dishes and glass.
- Take heavy frames and mirrors down from above beds and couches.

Start with the rooms where people sleep. Then the rooms where people spend the most time. Then the hallways and doors you'd use to get out.

> **Tip:** You don't have to do it all at once. Pick one room a month. A few furniture straps and cabinet latches cost less than a nice dinner out, and they work every day without batteries.

Know your home

Learn where your gas meter, main water valve and electrical panel are. Chapter 9 covers how to shut each one off. For earthquakes, the gas is the one people worry about most. FEMA's rule: if you smell gas or see a broken line, shut off the main valve from outside. Once the gas is off, a professional must turn it back on. So don't shut it off "just in case." You could be without heat and hot water for days waiting for the gas company.

Make a plan and a kit

Your family plan from Chapter 2 and your kits from Chapter 5 are the base. FEMA's checklist makes a good point: you don't know where you'll be when an earthquake hits, so keep supplies at home, at work and in the car. FEMA also suggests keeping a fire extinguisher at home and in your car. For earthquakes, add these:

- Keep a pair of sturdy shoes and a flashlight by every bed. There may be broken glass on the floor, and the lights may be out.
- Keep extra medicines, glasses, contact lens solution and hearing aid batteries on hand. FEMA lists these as special needs items to keep a supply of.
- Pick reunion points, as FEMA calls them, in case family members are apart when it happens.
- Make sure everyone at home knows to Drop, Cover, and Hold On.
- Pick a safe spot in each room: under a sturdy table or desk, or next to an inside wall away from windows and tall furniture.

How much should you store? FEMA's earthquake checklist says to be ready to manage on your own for at least 72 hours, and that it might be necessary to be self-reliant for up to two weeks. After a big earthquake, roads, pipes and power lines can all be damaged at once. I'd build toward the longer number a little at a time.

Earthquake early warning: ShakeAlert

In the West Coast states, there's a tool that can give you a few seconds' notice. ShakeAlert is an earthquake early warning system run by the USGS with its partners. It detects an earthquake as it starts and sends an alert before the strongest shaking reaches some areas. The USGS says this warning can range from seconds to minutes, which can be enough to Drop, Cover, and Hold On before the shaking hits.

According to the USGS, alerts through Wireless Emergency Alerts (WEA), the short emergency messages that authorities send to cell phones, are available in California, Oregon and Washington. The USGS lists three ways to get alerts on your phone:

- Wireless Emergency Alerts. Check your phone's settings for emergency alerts, or ask your phone company.
- A free app called MyShake, available in the Apple and Google Play app stores.
- Android phones, which have an earthquake alert feature built into the operating system in those three states.

If you get an alert, don't stop to read it twice. Drop, Cover, and Hold On right away.

Practice: the Great ShakeOut

The Great ShakeOut is a yearly earthquake drill where people practice Drop, Cover, and Hold On together at school, at work and at home. The drill happens each October in most areas. You can find drill details at shakeout.org, but you don't need anyone's permission to practice. Pick a day, call out "Earthquake!" and have everyone drop.

Practice matters because in a real earthquake there's no time to think it through. You want the move to be automatic.

Insurance

Check whether your homeowners or renters policy covers earthquake damage. Don't assume it does. Chapter 2 covers insurance, and an agent can tell you what's available in your state.

During: Drop, Cover, and Hold On

When the shaking starts, the Earthquake Country Alliance says Drop, Cover, and Hold On gives you the best overall chance of quickly protecting yourself. Here's how:

1. Drop where you are onto your hands and knees. This keeps the shaking from knocking you down and still lets you crawl.
2. Cover your head and neck with one arm and hand. If a sturdy table or desk is nearby, crawl under it. If not, get down next to an inside wall, away from windows.
3. Hold On until the shaking stops. If you're under a table, hold on to it with one hand and be ready to move with it if it shifts.

FEMA adds: stay away from glass, windows, outside doors and walls, and anything that could fall, like light fixtures and tall furniture. Stay inside until the shaking stops and it's safe to go out.

> **Caution:** Don't run outside while the ground is shaking. Falling glass, bricks and power lines near the outside walls of buildings are a real danger.

What not to do

The Earthquake Country Alliance is blunt about three common mistakes:

- Don't stand in a doorway.
- Don't run outside or to other rooms during shaking.
- Don't follow the "triangle of life" idea you may have seen online. The Alliance calls those actions potentially life threatening.

If you're in bed

Stay there. The Earthquake Country Alliance says not to get out of bed. Lie face down to protect your vital organs, and cover your head with a pillow. Getting up in the dark means walking on broken glass. This is also why shoes and a flashlight by the bed matter.

If you use a wheelchair or walker, or can't get down

If you're seated and can't drop to the floor, the Earthquake Country Alliance says to bend forward, cover your head with your arms and hold on to your neck with both hands.

If you use a wheelchair or walker, the Great ShakeOut drill site (shakeout.org) says to lock your wheels if they have locks, then bend forward and protect your head and neck with your arms, a book or a pillow until the shaking stops. If you use a cane, keep it near you so you can use it when the shaking stops.

If you're outside

Stay outside. The Alliance says to remain inside if you're inside and outside if you're outside. Move to a clear area if you can do it safely, away from power lines, trees, signs, buildings and vehicles. Then drop and cover your head and neck.

If you're driving

Pull over to the side of the road, stop and set the parking brake. FEMA says to stay in the car. When the shaking stops, drive carefully and watch for cracked roads and fallen objects.

> **Caution:** Don't get out and lie next to your car. The Earthquake Country Alliance warns that the car can move and crush you.

In stores, tall buildings and stadiums

- In a store, drop and cover where you are. The Alliance says getting next to a shopping cart or under clothing racks may give extra protection.
- In a tall building, stay away from windows and don't use the elevators.
- In a theater or stadium, drop to the ground in front of your seat or lean over as far as you can, and cover your head and neck.

If you're near the coast

If you're at the beach or in a low coastal area and you feel a strong earthquake, protect yourself during the shaking. When it lets up, the Alliance says to walk quickly to high ground or inland, because a tsunami may arrive soon. Don't wait for an official warning. Chapter 16 covers tsunamis.

After: the first hours and days

When the shaking stops, take a breath and then work through this list in order:

1. Check yourself, then the people around you, for injuries. FEMA says to stop bleeding by putting direct pressure on the wound. Call 911 for serious injuries. Chapter 8 covers first aid.
2. Put on shoes before you walk anywhere.
3. Look and sniff for fire and gas. If you smell gas or see a broken gas line, shut off the main gas valve from outside if you can do it safely, and get everyone out. If possible, put out small fires.
4. Check your home for damage. FEMA says not to go into a home if you see large cracks in the foundation or if the home is leaning.
5. If you're near the coast, head for high ground right away.
6. Text your out-of-area contact. FEMA suggests text messages for non-emergency communication in the first 24 hours after a major earthquake. Phone lines may be overloaded, and texts often get through when calls don't.
7. Listen to local news or official alerts for instructions.

Aftershocks

Expect more shaking. FEMA says aftershocks can continue for weeks or even months after an earthquake. Each time, Drop, Cover, and Hold On again. Stay out of damaged buildings.

Aftershocks are hard on nerves, especially for kids. That's normal. Keep routines going, keep shoes and flashlights by the beds, and talk about what's happening in plain words.

Gas leaks and fire

Broken gas lines can lead to fires after an earthquake. FEMA says not to use electrical switches or appliances if you suspect a gas leak, because sparks can ignite gas from broken lines, and to use matches or candles only once you're confident there's no leak. Use flashlights. If you smell gas, get everyone out and call the gas company or 911 from outside. Chapter 9 covers gas leaks step by step.

Checking your home

Once everyone is safe, walk around your home slowly. Look for cracks in the foundation, chimney damage, leaning walls and broken windows. Check for water leaks. If anything looks wrong, stay out and call your local building department or a licensed contractor. Take photos of the damage before you clean up, for insurance. Chapter 26 covers recovery, insurance claims and disaster help.

Water and sewer pipes can break in a big earthquake. Until officials say your tap water is safe, use your stored water or treat it as Chapter 3 explains.

Special notes

Kids

Practice Drop, Cover, and Hold On with your kids, and make it a game for little ones: whoever drops fastest picks dinner. Ask their school or daycare about its earthquake plan and how you'll be reunited with your children. Kids may be scared by aftershocks for weeks. Keep routines as normal as you can, and see Chapter 8 for help with kids' stress.

Older adults and people with disabilities

Practice the version of Drop, Cover, and Hold On that works for your body, whether that's dropping to the floor or bending forward in a chair. Keep a whistle, glasses, hearing aids, medicines and mobility aids within reach of your bed. If you use power-dependent medical equipment, plan for outages (Chapter 10). Ask a neighbor to check on you after a quake, and check on older neighbors yourself.

Pets

Pets often run and hide after an earthquake. Make sure they wear ID tags. Keep leashes and carriers where you can grab them, and don't let pets roam where there's broken glass.

Renters

Ask your landlord before drilling into walls. Many will agree to furniture straps if you ask. You can still move heavy things to low shelves, keep shoes by the bed and pick your safe spots without touching a wall. Ask your insurance agent whether your renters policy covers your belongings in an earthquake.

Mobile and manufactured homes

Your Drop, Cover, and Hold On steps are the same. Ask the home's manufacturer, your landlord or a licensed installer how the home is anchored and whether earthquake bracing is available for your area.

Quick checklist

- ☐ Strap tall furniture, TVs and the water heater to the wall.
- ☐ Move heavy and breakable things to low shelves, and take heavy frames off the wall above beds.
- ☐ Keep shoes and a flashlight by every bed.
- ☐ Learn where your gas, water and power shutoffs are, and when to use them.
- ☐ Practice Drop, Cover, and Hold On with everyone at home.
- ☐ Join the Great ShakeOut drill each October.
- ☐ If you live in California, Oregon or Washington, turn on emergency alerts on your phone.
- ☐ Store water and food, building toward two weeks.
- ☐ Pick reunion points and an out-of-area contact, and plan to text.
- ☐ Ask your insurance agent whether you have earthquake coverage.

Chapter 16: Tsunamis, Volcanoes, and Landslides

This chapter covers three hazards that most households will never face, but that matter a great deal to the people who live near them. If you live on the Pacific coast, in Alaska or Hawaii, near a volcano in the West, or on or below a steep hillside anywhere in the country, this chapter is for you. If you visit those places, it's for you too.

These three have something in common: when they come, they move fast and the right action is usually to get away from the danger, early and on your own two feet if needed. A few minutes of reading now can make those decisions easy later.

Part one: tsunamis

What a tsunami is and where it happens

A tsunami is a series of ocean waves that a large earthquake under or near the ocean floor can set off. It isn't one wave. The National Weather Service (NWS) describes a tsunami as a series of extremely long waves. So the danger doesn't end when the first wave pulls back.

Tsunami waves can cross the open ocean fast. The NWS says some travel as fast as 600 mph. That's why, when the earthquake is close to shore, there may not be time for an official warning. More on that below.

The NWS rates the tsunami hazard for U.S. coasts like this:

U.S. coast	Tsunami hazard (NWS rating)
Alaska, Hawaii and the U.S. West Coast	High to very high
U.S. Atlantic Coast	Very low to low
Alaska Arctic Coast and U.S. Gulf Coast	Very low

So a tsunami is mostly a Pacific problem. But "very low" isn't "none," so if you live or vacation on any coast, learn the natural warning signs below. They take one minute to learn.

Natural warning signs: don't wait for an official alert

The NWS says that if you're near the coast and you notice any of these, a tsunami could be coming:

- You feel a strong or long earthquake.
- You see a sudden rise or fall of the ocean, like the water pulling far back from the shore.
- You hear a loud roar from the ocean.

If you notice any one of these, move quickly to high ground or inland, away from the water. The NWS warns that there may not be enough time for an official warning, so nature's warning is your signal to go.

> **Caution:** Don't go down to the beach to look at the water pulling back. That's the tsunami on its way. Head inland or uphill right away.

If you're on the coast and the ground shakes, protect yourself first with Drop, Cover, and Hold On (Chapter 15). When the shaking lets up, the Earthquake Country Alliance says to walk quickly to high ground or inland, because a tsunami may arrive soon.

The alerts you'll hear

Official tsunami alerts come from the U.S. Tsunami Warning Centers, part of the National Oceanic and Atmospheric Administration (NOAA). You'll see them at tsunami.gov and hear them through phone alerts, NOAA Weather Radio and local news. There are four levels:

Alert	What it means	What to do
Tsunami Warning	A tsunami that could cause widespread flooding is imminent, expected or happening.	Move to high ground or inland.
Tsunami Advisory	A tsunami that could cause strong currents or waves dangerous to people in or very near the water is imminent, expected or happening.	Stay out of the water, away from beaches and waterways.
Tsunami Watch	A tsunami may later affect the watch area.	Stay tuned for more information. Be prepared to act.
Tsunami Information Statement	An earthquake or tsunami has happened that people in the area may want to know about.	No action suggested at this time.

You might ask, "If it's only an advisory, can I stay at the beach?" No. An advisory means currents and waves that are dangerous to anyone in or very near the water. Get out of the water and off the beach until officials say it's over.

Before: get ready

- Find out if you live, work, go to school or vacation in a tsunami hazard zone. Your county or state emergency management office can tell you.
- The NWS says to learn the evacuation routes, identify safe places and practice evacuating. Walk the route from your home to high ground at least once so you know how long it takes.
- Keep a go-bag ready (Chapter 5) so you can leave in seconds, not minutes.
- Sign up for local emergency alerts and turn on emergency alerts on your phone (Chapter 6).
- When you check into a hotel or vacation rental on the coast, look for the evacuation map and ask the front desk where the route goes.

During: when a tsunami is coming

1. If you feel a strong or long earthquake on the coast, Drop, Cover, and Hold On until the shaking stops.
2. Then move to high ground or inland right away. Don't wait for an official alert or for others to go first.
3. Go on foot if you can. Bring your go-bag only if it's right by the door.
4. The NWS says you're generally safer going to official evacuation zones, higher ground or further inland. Follow the evacuation signs where they exist.
5. Stay away from the coast until officials say it's safe. A tsunami is a series of waves, and more may come.

FEMA's earthquake checklist puts it simply: when local authorities issue a tsunami warning, assume that a series of dangerous waves is on the way. That's why you don't go back after the first wave.

After a tsunami

Wait for officials to say it's safe before you go back to the shore or your home. Tsunami flooding leaves behind the same hazards as other floods: damaged buildings, broken power and gas lines, debris and dirty water. Chapter 13 covers floodwater safety, and Chapter 26 covers returning home and recovery.

Part two: volcanoes

Where volcanoes are in the United States

The U.S. Geological Survey (USGS) says its scientists monitor over 160 active and potentially active volcanoes in the United States. Most are in Alaska, a state where the USGS says eruptions happen almost every year. The rest are in the American West and in Hawaii. Kilauea, on the Island of Hawaii, is one of the most active volcanoes on Earth. Many U.S. volcanoes sit around the Pacific Ocean in what is known as the "Ring of Fire." Well-known ones in the West include Mount Shasta in California, Mount Hood in Oregon and Mount St. Helens in Washington.

Most Americans don't live close to an active volcano. But the wind can carry ash well beyond the mountain, and mudflows can travel down river valleys.

Volcano dangers in plain words

- Ash. Volcanic ash isn't like the soft ash in a fireplace. The USGS describes it as tiny pieces of tephra (rock blown out of a volcano), about the thickness of a strand of hair, that the wind can carry. It's gritty, it scratches eyes and lungs, and wet ash is heavy.
- Mudflows. A lahar is a volcanic mudflow. The USGS describes it as a hot or cold mixture of water and rock fragments that flows quickly down the slopes of a volcano. The USGS says lahars can move up to 40 miles per hour through valleys and stream channels and reach more than 50 miles from the volcano. They often come with an eruption, but heavy rain or snow can set one off even without an eruption. The Centers for Disease Control and Prevention (CDC) warns people near streams and rivers to watch for rising water and possible mudflows in low areas.
- Gases. The CDC warns that volcanic gases and fumes can irritate your eyes, nose and throat.
- Lava and hot flows. Lava and other flows of hot volcanic material can kill. If officials close an area near a volcano, stay out.

Before: get ready

If you live near a volcano in Alaska, Hawaii or the West:

- Learn whether your home, school or work is in a hazard zone, especially a river valley below the volcano. Your county or state emergency management office can tell you.
- Know your evacuation routes, and pick one that heads uphill and away from river valleys.
- Keep N95 respirators approved by the National Institute for Occupational Safety and Health (NIOSH) and a pair of goggles for each person. The CDC recommends both for ashfall.
- Keep your go-bag and home kit ready (Chapter 5). Ash can close roads and stop deliveries for days.

During an eruption

The CDC's first rule is the same as for wildfires: if you're warned to evacuate because an eruption is about to happen, evacuate. The CDC also says to leave the area immediately if a lava flow, a lahar or a pyroclastic flow (another kind of fast, hot volcanic flow) is headed toward you.

If you're not in the evacuation area but ash is falling, the CDC says:

- Stay inside if you can, with windows and doors closed.
- Close all windows, doors and fireplace or woodstove dampers. Turn off all fans and heating and air conditioning systems.
- Bring pets and livestock into closed shelters.
- If you go outside or clean up ash, wear a NIOSH-approved N95 respirator and goggles.
- Keep your car or truck engine switched off. Ash can damage engines, and driving stirs it up.
- If you're near a stream or river, watch for rising water and possible mudflows in low areas. Move uphill quickly.
- If volcanic gases make your eyes, nose or throat burn, move away from the area right away.

Caution: The CDC notes that disposable particle respirators, like N95s, do not filter toxic gases and vapors. An N95 helps with ash, not with volcanic gas. If you smell strong gas or your eyes and throat burn, leave the area.

After an eruption: dealing with ash

Ash cleanup is a bit like cleaning up after a wildfire (Chapter 14), with one big difference: there may be a lot more of it, and it's heavy. The CDC's guidance for after an eruption:

- Stay away from areas where ash has fallen, if you can.
- Wear a NIOSH-approved N95 respirator and goggles to protect your lungs and eyes, and keep your skin covered so the ash doesn't irritate it.
- Clear ash off roofs. The CDC warns that ash is very heavy and can cause buildings to collapse. It's also slippery, so be very careful up there, or get help.
- Avoid driving in ash if you can. The CDC says driving in ash is hazardous to your health and your car, because it stirs ash up and can clog engines.
- If your drinking water has ash in it, use another source of drinking water until it can be tested. Your stored water (Chapter 3) is for days like this.
- Keep heating and air conditioning units and fans off until the ash is cleaned up, and replace or clean furnace filters often.

Keep kids away from ash and out of cleanup work, and listen to local officials about where to put the ash you clear.

Part three: landslides and debris flows

What they are and where they happen

A landslide is the movement of rock, earth or debris down a slope. Some move slowly. Others move fast. A debris flow is a fast kind of landslide: a rushing mix of water, mud, rocks and plants that pours down a slope or a stream channel.

They're a concern for homes on or below steep slopes and in canyons. The USGS points to heavy rain, especially on land burned by wildfire, as a common trigger.

After wildfires: a special danger

Burned hills are a special case. The USGS explains that after a fire, plants are gone and the soil changes, so the ground can't soak up rain the way it did. That raises the risk of debris flows. The USGS says they are usually set off by short bursts of heavy rain, can happen during the first storm after a wildfire, and can be triggered by fairly modest storms. They often move faster than a person can run and can travel far beyond the burned area.

If you live below a burned area, treat every heavy rain forecast as a reason to get ready to leave. Chapter 14 covers wildfires.

Warning signs

The USGS lists signs that a landslide may be developing. Watch for:

- New cracks, bulges or other changes in the ground, roads or other surfaces.
- Water flowing on a slope, or water pooling where it never has before.
- Utility lines that sag or are pulled tight because poles are leaning, plus bent fences or tilting trees on a hillside.
- Windows or doors that suddenly stick, and new cracks in walls, ceilings or the foundation.
- Broken or leaking water, septic or sewer lines.
- A house pulling away from its foundation, or soil pulling away from the foundation.
- Unusual changes in the water level of a well.

The USGS also lists signs that a landslide is moving right now:

- Unusual sounds, like cracking or breaking wood, knocking boulders or the ground groaning.
- A loud rumble and ground shaking, which fast-moving landslides are said to make, according to the USGS.
- A sudden change in the water level of a creek or stream, especially during or right after a big or long storm.

> **Tip:** A creek that suddenly rises or drops during heavy rain is a warning sign, not good news.

If you see signs of a possible landslide, the USGS says to report it to your local authorities so the area can be checked.

During a landslide

1. Leave the area right away, but only if it's safe to do so. That's the USGS's first rule.
2. If a landslide is hitting your building, don't run outside into it. The USGS says to go to the highest floor or climb onto a countertop, because if you try to get out through an active landslide, it can carry you away.
3. Report the landslide to your local authorities right away.
4. Expect more. The USGS says landslides can come in pulses, so the first one may not be the last.

After a landslide

Stay away from the slide area until officials say it's safe, since the USGS warns that more slides can follow. Watch for broken power, gas and water lines, and report them to the utility. Chapter 13 covers floods, and Chapter 26 covers recovery.

Before: get ready

- Learn whether your home sits on or below a steep slope, near a canyon mouth, or below a burned area. Your county can tell you about local landslide maps.
- Watch your property for the warning signs above, especially after heavy rain.
- Sign up for local alerts and pay attention to flash flood and debris flow warnings (Chapter 6).
- Plan a way out that doesn't go through a canyon or along a stream channel.
- Ask your insurance agent whether your policy covers landslide or mudflow damage. Don't assume it does. Chapter 2 covers insurance.

Special notes

Kids

Teach kids on the coast the three natural tsunami signs and one rule: "If the ground shakes hard or the ocean acts strange, we go uphill right away." Practice the walk to high ground together. Keep children away from volcanic ash and landslide areas.

Older adults and people with disabilities

If you can't walk quickly, plan ahead. Know the closest high ground and how long it takes you to get there. Ask a neighbor to help you leave in a tsunami or eruption warning, and leave early. Keep an N95 respirator and goggles handy if you live where ash can fall.

Pets

Bring pets and livestock into closed shelters during ashfall, as the CDC advises. Take pets with you when you evacuate, and keep leashes and carriers by the door.

Renters and visitors

You don't need to own the home to know your hazard zone. Ask your landlord or the front desk where the evacuation route goes, and look up the tsunami or landslide maps for the address.

Quick checklist

- ☐ Learn the three natural tsunami signs: strong or long shaking, the ocean rising or falling suddenly, a loud roar.
- ☐ If you live on or visit the coast, find your evacuation route and walk it once.
- ☐ Know the four tsunami alert levels: warning, advisory, watch and information statement.
- ☐ If you live near a volcano, keep N95 respirators and goggles for each person.
- ☐ Know your route uphill and away from river valleys.
- ☐ Learn the warning signs of a landslide and check your property after heavy rain.

- ☐ If you live below a burned area, get ready to leave whenever heavy rain is forecast.
- ☐ Sign up for local alerts and turn on emergency alerts on your phone.

Chapter 17: Winter Storms and Extreme Cold

Winter weather is not just a problem for the northern states. Snow, ice, and dangerous cold can reach much of the country, and places that rarely see it are often the least ready when it comes. A few inches of snow or a quarter-inch of ice can close roads, bring down power lines, and leave a household cold and in the dark for days.

This chapter covers the winter alerts you'll hear, how cold hurts the body and what to do about it, how to heat your home without starting a fire or poisoning your family, keeping pipes from freezing, driving in winter, and looking after older neighbors and pets.

Snow and ice can bring down power lines and block roads in hours. When a winter storm knocks out electricity, a house loses heat faster than most people expect. Keep extra blankets, safe heating options and stored water at home before the first freeze.

What winter storms and extreme cold are

A winter storm can bring heavy snow, freezing rain, sleet, strong wind, or a mix of all of them. Extreme cold can come with a storm or after it, or on clear, still days with no snow at all.

Here are the main kinds of winter weather, in plain terms:

- **Heavy snow** makes roads dangerous, can collapse weak roofs, and can trap people at home.
- **Freezing rain** falls as rain and freezes when it hits the ground, trees, and power lines, coating them in ice. The weight of the ice can bring down branches and power lines, which is why ice storms often cause long outages.
- **Sleet** is rain that freezes into ice pellets before it reaches the ground. It makes roads slick.
- **Blizzards** combine snow (falling or blowing) with strong wind, making it hard or impossible to see.
- **Extreme cold** is dangerous on its own. The body can lose heat faster than it can make it.

The alerts and words you'll hear

The National Weather Service (NWS) issues winter alerts for your area. Chapter 6 explains the general difference between a watch (conditions are possible, get ready), a warning (it is happening or about to happen, take action), and an advisory (less serious, but still be careful).

The common winter alerts include:

Alert	What it means for you
Winter Storm Watch	Conditions are favorable for a significant winter storm (heavy snow, heavy sleet, ice, blowing snow, or a mix). Get ready now.
Winter Storm Warning	A significant winter weather event (snow, ice, sleet, blowing snow, or a mix) is expected. Stay off the roads if you can.
Winter Weather Advisory	Snow, blowing snow, ice, sleet, or a mix is expected, but not bad enough for a warning. Use caution, especially on roads.

Alert	What it means for you
Ice Storm Warning	Ice buildup of around 1/4 inch or more is expected. Expect power outages and dangerous travel.
Blizzard Warning	Sustained winds or frequent gusts of 35 mph or more with falling or blowing snow, often cutting visibility to less than 1/4 mile for three hours or more. Don't travel.
Lake Effect Snow Warning	Snow squalls or heavy snow showers coming off a lake are expected to pile up significant snow, sometimes in narrow bands.
Extreme Cold Watch	Extremely dangerous cold or wind chills are possible, but the timing or location is still uncertain. (Replaced the Wind Chill Watch.)
Extreme Cold Warning	Extremely dangerous cold or wind chills are expected or happening now. (Replaced the Wind Chill Warning.)
Cold Weather Advisory	Dangerously cold conditions are expected, but not cold enough for a warning. (Replaced the Wind Chill Advisory.)
Freeze Watch	Significant, widespread freezing temperatures are possible in the next day or so.
Freeze Warning	Temperatures are forecast to drop below 32 F for a long period of time.

The 2024 name changes

If you remember hearing about "Wind Chill Warnings," the names have changed. On October 1, 2024, the NWS renamed its cold alerts across the country so people understand that cold can be dangerous with or without wind:

- Wind Chill Watch became Extreme Cold Watch.
- Wind Chill Warning became Extreme Cold Warning.
- Wind Chill Advisory became Cold Weather Advisory.
- Hard Freeze Watch became Freeze Watch, and Hard Freeze Warning was folded into Freeze Warning.

The temperatures that trigger these cold alerts are set for each local area, based on its normal climate and what temperatures cause problems there. Cold that brings an alert in a warm state may be an ordinary winter day in a cold one.

Wind chill

Wind chill is how cold it feels on your skin when the wind is blowing. The NWS says wind chill is how cold people and animals feel outside, based on how fast exposed skin loses heat to wind and cold. For example, the NWS wind chill chart shows that an air temperature of 0 degrees F with a 15 mph wind feels like 19 below zero, and at that wind chill, exposed skin can freeze in 30 minutes.

A few things wind chill does not do: it doesn't make your car or your pipes colder than the actual air temperature, and frostbite needs the actual air temperature to be below freezing. The NWS uses wind chill only when it is 50 degrees F or colder and the wind is faster than 3 mph.

Tip: Your phone's weather app and the NWS forecast for your area usually show both the temperature and the wind chill (sometimes called "feels like"). Dress for the wind chill.

Before winter: get your home ready

I'd do most of this in the fall, when stores are stocked and nobody is in a hurry.

Heating equipment

- Have a qualified technician check your furnace and its vents every winter. The Centers for Disease Control and Prevention (CDC) recommends this.
- If you plan to use a fireplace or wood stove, have the chimney or flue inspected each year.
- Install a smoke alarm and a battery-operated carbon monoxide (CO) alarm near any area you plan to heat. Test them monthly and replace batteries twice a year, per the CDC. Chapter 9 covers smoke and CO alarms in detail.
- Keep a multipurpose, dry-chemical fire extinguisher nearby.
- Make sure all fuel-burning equipment is vented to the outside.

Seal out the cold

The CDC suggests insulating walls and attics, sealing drafts around doors and windows, and adding storm windows or covering windows with plastic from the inside. Even a rolled towel against the bottom of a drafty door helps on a cold night.

Water pipes

Frozen pipes can burst, and a burst pipe can flood your home when it thaws. The CDC says to insulate water lines that run along exterior walls so they are less likely to freeze.

Know where your main water shutoff is (Chapter 9), so you can turn it off fast if a pipe bursts. The American Red Cross adds these steps, which I've put in my own words:

- Before the first freeze, disconnect and store garden hoses. If your outdoor faucets have a shutoff valve inside the house, close it, then open the outdoor faucet and leave it open so any water left inside has room to expand.
- Insulate the attic, basement, and crawlspace. Foam pipe sleeves or listed heat tape on exposed pipes help.
- Keep the garage door closed if water lines run through the garage.
- On very cold nights, open kitchen and bathroom cabinet doors so warm air reaches the pipes. Move cleaning products up and out of children's reach while the doors are open.
- Let cold water drip from a faucet served by exposed pipes. Moving water is harder to freeze.
- Keep the thermostat at the same temperature day and night during a cold snap. Your heating bill may go up a little; a burst pipe costs far more.
- If you go away, leave the heat on, set no lower than 55 degrees F.

If a pipe freezes

If you turn on a faucet and only a trickle comes out, a pipe may be frozen. Pipes along outside walls or where the water line comes through the foundation are common trouble spots.

1. Leave the faucet open. As the ice melts, running water helps melt the rest.
2. Warm the frozen section gently with an electric heating pad, an electric hair dryer, or towels soaked in hot water. A portable space heater can help if it is kept well away from anything that can burn.
3. Keep warming until full water pressure comes back.

4. Check the other faucets in the house. If one pipe froze, others may have too.
5. If you can't find the frozen spot, can't reach it, or can't thaw it, call a licensed plumber.

Caution: Never thaw a pipe with a blowtorch, a kerosene or propane heater, a charcoal stove, or any open flame. It can start a fire, and fuel-burning heaters indoors can make carbon monoxide.

Supplies for a winter storm

Your basic home kit from Chapter 5 covers most of what you need. For winter, add:

- Extra blankets, sleeping bags, hats, gloves or mittens, and warm socks for everyone.
- Flashlights and batteries (Chapter 10).
- A few days of food that doesn't need cooking, and water (Chapters 3 and 4).
- Any medicines you need, refilled before a storm.
- A snow shovel, and rock salt or sand for steps and walkways.
- An easy-to-read indoor thermometer, especially for older adults.

The CDC says to check your emergency supplies, including food and water, whenever a winter storm or extreme cold is expected.

During a winter storm or cold snap

What to do, roughly in order of priority:

1. Stay indoors as much as you can. The CDC says to try to stay indoors during extremely cold weather and keep trips outside short.
2. Stay off the roads, especially when visibility is low. Don't travel unless you must.
3. Keep the house warm safely (see below), and keep everyone in one or two warm rooms if the heat fails.
4. Check on older relatives and neighbors.
5. Bring pets inside.
6. Keep listening for updates from the NWS and local officials.

Heating safely

These rules come from the CDC and the U.S. Consumer Product Safety Commission (CPSC):

- Keep space heaters and other heat sources at least 3 feet away from drapes, furniture, bedding, and anything else that can burn.
- Use fireplaces and wood stoves only if they are properly vented to the outside.
- Never run a generator, grill, or camp stove indoors or in an enclosed space. They make carbon monoxide.
- Never leave a portable heater running unattended, and plug electric heaters directly into a wall outlet, never a power strip (CPSC). Chapter 9 has the full list.

Caution: Never use a generator inside your home or garage, even with the doors and windows open. Keep it outside, at least 20 feet from doors, windows, and vents. If anyone feels dizzy, sick to the stomach, or confused while heaters or a generator are running, get everyone into fresh air and call 911. Chapters 9 and 10 cover carbon monoxide and generators.

If the power goes out in the cold

Ice storms and heavy snow often take out power. Chapter 10 covers outages in detail. In winter:

- Pick one room, ideally an inside room with few windows, and gather everyone there. Close off the rest of the house.
- Hang blankets over windows and doorways, and put towels at the bottom of doors.
- Dress in layers, wear a hat, and eat and drink to help your body make heat.
- Watch for signs of hypothermia in everyone, especially babies and older adults.
- If your home gets too cold to stay safely, go to a relative's home or a warming center. Call 211 or check your local government's website or social media to find one.

Dressing for cold

The CDC suggests layers:

- An inner layer that holds body heat and doesn't soak up moisture. The CDC names wool, silk, and polypropylene as holding more body heat than cotton.
- An insulating middle layer that traps warm air, such as fleece or wool.
- An outer layer that blocks wind, rain, and snow.

Stay dry. Wet clothes chill the body fast. Change out of damp clothes and socks as soon as you come in.

Shoveling snow

The CDC says cold weather puts an extra strain on the heart. If you have heart disease or high blood pressure, follow your doctor's advice about shoveling snow. Dress warmly and work slowly so you don't sweat too much. If you feel chest pain while shoveling, I'd stop right away and call 911.

Walking on ice

The CDC calls walking on ice extremely dangerous. Keep steps and walkways clear, and use rock salt, a de-icer, or sand on them. I'd also wear boots with good tread and take short steps.

Cold injuries: frostbite and hypothermia

This book is not medical training. Call 911 for anyone who seems seriously ill from the cold. Chapter 8 covers first aid classes and basic first aid.

Hypothermia

Hypothermia means the body's temperature has dropped too low. The CDC calls it a medical emergency. It can happen even above 40 degrees F if a person gets chilled from rain, sweat, or being in cold water.

Who	Warning signs (CDC)
Adults	Shivering, exhaustion or feeling very tired, confusion, fumbling hands, memory loss, slurred speech, drowsiness
Infants	Bright red, cold skin; very low energy

What to do, based on CDC guidance:

1. If you can, take the person's temperature. If it is below 95 degrees F, get medical help right away. Call 911.
2. While you wait, get the person into a warm room or shelter.
3. Take off any wet clothing.
4. Warm the center of the body first: chest, neck, head, and groin. Use an electric blanket if you have one, or skin-to-skin contact under loose, dry layers of blankets, clothing, towels, or sheets.
5. Warm, non-alcoholic drinks can help a person who is awake. Never try to give a drink to someone who is unconscious.
6. After body temperature rises, keep the person dry and wrapped in a warm blanket, including the head and neck, and get them medical care.
7. If the person seems to have no pulse or isn't breathing, call 911 and start CPR, even if the person looks dead. Keep going, and keep warming them, until the person responds or help arrives.

Frostbite

Frostbite is an injury caused by freezing. It most often affects the nose, ears, cheeks, chin, fingers, and toes. It can cause permanent damage, and in bad cases, the loss of a finger or toe.

Signs, according to the CDC:

- Redness or pain in the skin may be the first sign.
- A white or grayish-yellow patch of skin.
- Skin that feels unusually firm or waxy.
- Numbness. A person often doesn't know they have frostbite until someone else notices it.

What to do:

1. Check for hypothermia first. The CDC says hypothermia is more serious and needs emergency medical care.
2. Get the person into a warm room as soon as you can.
3. Unless absolutely necessary, don't walk on frostbitten feet or toes. It makes the damage worse.
4. Put the frostbitten area in warm, not hot, water. Test the water with skin that isn't frostbitten.
5. If you don't have warm water, use body heat. For example, warm frostbitten fingers in an armpit.
6. Get the person checked by a health care provider.

Caution: Don't rub frostbitten skin with snow, and don't massage it. Don't use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator to warm it. Numb skin burns easily.

Driving in winter

The safest winter drive is the one you don't take. The CDC advises against traveling in low visibility and against driving on ice-covered roads, overpasses, and bridges if at all possible. If you must go, tell someone your route and when you expect to arrive.

Get the car ready

- Keep the gas tank near full. The CDC says this helps keep ice out of the tank and fuel lines.
- Have the battery, tires, wipers, and antifreeze checked before winter.

Winter car kit

The CDC suggests keeping these in the car in winter:

Item	Why
Extra hats, coats, mittens, and blankets	To stay warm if you're stuck
Cell phone and portable charger	To call for help
Windshield scraper	To see
Shovel	To dig out
Flashlight	For light and signaling
Water and snack food	To keep your energy up
First aid kit	For minor injuries
Tire chains	For traction where they're allowed
Waterproof matches and a can to melt snow for water	In case you're stuck a long time
Battery-powered radio and extra batteries	For news and weather
Sand, cat litter, or road salt; jumper cables	To get moving again

Chapter 5 covers the full car kit, and Chapter 25 covers what to do if you're stranded.

If you get stuck

The CDC says staying in your car is often the safest choice when visibility is poor or roads are icy. To stay warm, the CDC says to run the motor (and heater) for about 10 minutes each hour, opening one window slightly to let in air. Make sure snow is not blocking the exhaust pipe, because a blocked pipe can send carbon monoxide into the car.

Caution: Before you run the engine while stuck, check that the exhaust pipe is clear of snow. Check it again every time you get out of the car.

Special notes

Older adults

The CDC says older adults are more likely to have health problems caused by cold. It suggests keeping an easy-to-read thermometer where you'll see it often, and checking the temperature in your home often during winter. If you have an older neighbor or relative, call or stop by every day during a cold snap or an outage.

Babies and young children

Babies lose heat quickly and can't tell you they're cold. Watch for the infant signs of hypothermia in the table above: bright red, cold skin and very low energy. Never use a space heater, blankets, or pillows in a way that is unsafe for a sleeping baby; ask your pediatrician how to keep a baby warm safely during an outage.

People with disabilities and medical needs

If you use power for oxygen, a wheelchair, or other medical equipment, make an outage plan before winter (Chapter 10). Ask your doctor whether any of your medicines make it harder for your body to handle cold.

Pets

The CDC says to bring pets indoors. If you can't, give them adequate shelter to keep them warm and make sure they have unfrozen water. I'd also wipe their paws after walks on salted sidewalks.

Renters

If your heat fails, tell your landlord right away, in writing if you can. Rules about how warm a landlord must keep a rental differ by state and city. Check your state and local rules, or call your local housing office.

Mobile and manufactured homes

In a mobile or manufactured home, I'd check that the skirting around the base is intact and insulate any pipes you can see underneath. Keep space heaters at least 3 feet from curtains, furniture, bedding, and anything else that can burn.

After the storm

- Clear snow away from the outside vents of fuel-burning appliances such as your furnace. The CPSC warns that blocked vents can let carbon monoxide build up in the house.
- Check your roof and gutters from the ground for heavy snow or ice buildup. Don't climb on an icy roof.
- Watch for downed power lines and tree limbs. Assume any downed line is live (Chapter 10).
- Look for burst or leaking pipes as things thaw.
- Keep checking on neighbors until power and roads are back to normal.

Quick checklist

- ☐ Have the furnace checked and the chimney inspected before winter.
- ☐ Put smoke and CO alarms near any area you heat, and test them monthly.
- ☐ Insulate pipes along outside walls and know where your water shutoff is.
- ☐ Add blankets, hats, mittens, and warm socks to the home kit.
- ☐ Build a winter car kit and keep the gas tank near full.
- ☐ Learn the NWS winter alert names, including Extreme Cold Warning and Cold Weather Advisory.
- ☐ Learn the signs of hypothermia and frostbite.
- ☐ Keep space heaters 3 feet from anything that can burn; never run generators, grills, or camp stoves indoors.
- ☐ Bring pets inside when it's very cold.
- ☐ Make a plan to check on older neighbors and relatives during cold snaps.

Chapter 18: Extreme Heat and Drought

Heat doesn't knock down houses or flood streets, so it's easy to shrug off. That's a mistake. A National Weather Service office puts it plainly: heat is the number one weather-related cause of death in the United States. Ready.gov says extreme heat causes more deaths each year than any other weather-related hazard. Heat works quietly. It hits the people who live alone, the ones without air conditioning, babies and older adults, and folks who work outside.

This chapter covers how to read heat alerts, how to keep your home and body cool, how to spot heat illness and what to do about it, and how to get through heat when the power is out. It ends with drought: what it means for your household and where to check conditions. The good news is that almost every heat death is preventable with simple steps, and most of those steps cost little or nothing.

What extreme heat is and where it happens

Ready.gov describes extreme heat as a period of high heat and humidity with temperatures above 90 degrees for at least two to three days. Humidity matters because it makes the air feel hotter than the thermometer says. When sweat can't dry off your skin, your body loses its best way to cool down.

You might ask, "I live up north. Is this really my problem?" It can be. The National Weather Service issues heat alerts all over the country, and a home without air conditioning can get dangerously hot in any state. A stuffy top-floor apartment with windows that won't open can be just as risky as a desert backyard.

Who is most at risk

Anyone can get sick from heat, but the Centers for Disease Control and Prevention (CDC) names older adults, young children and people with chronic medical conditions as being at high risk for heat-related illness and death. Ready.gov names the same groups: older adults, children and people with certain illnesses and chronic conditions.

Older adults have a harder time for a few reasons, according to the CDC. Their bodies can't adjust to sudden temperature changes as fast as younger people. They are more likely to have chronic illnesses that affect how their body controls its temperature. And certain medicines they take can affect how their bodies handle heat.

Other people who need extra care in a heat wave:

- Babies and young children, who depend on adults to keep them cool and give them fluids.
- People who work outside or in hot indoor spaces like kitchens, warehouses and laundries.
- People who live alone, especially older neighbors who may not leave the house or call for help.
- Anyone without air conditioning, or with air conditioning they can't afford to run.
- People who take medicines that affect sweating, fluids or alertness. Ask your doctor or pharmacist whether any of yours do.
- Pets, especially older dogs, flat-faced breeds and animals kept outside.

Heat alerts and the words you'll hear

The National Weather Service (NWS) issues heat alerts for your area. On March 4, 2025, the NWS changed two names. The old "Excessive Heat Watch" is now an **Extreme Heat Watch**, and the old "Excessive Heat

Warning" is now an **Extreme Heat Warning**. If you see the old names in older materials, they mean the same thing.

Alert	What it means for you
Heat Advisory	Dangerous heat is expected, but not bad enough to reach warning level. Take action: limit time outside, stay cool and check on people at risk.
Extreme Heat Watch	Conditions are favorable for an extreme heat event, but when or whether it happens is still uncertain. Be prepared: make your cooling plan now.
Extreme Heat Warning	Extremely dangerous heat is expected or already happening. Take action: put your plan to work.

When an alert goes out is decided locally: NWS offices work with local partners to set the heat index levels for their area, so the numbers differ from place to place. For example, the NWS office in Wilmington, North Carolina, lists a Heat Advisory for heat index values of 105 to 109 degrees for two or more hours, and an Extreme Heat Watch or Warning for heat index values of 110 degrees or more for two or more hours. Check your own local NWS office's website for the numbers it uses.

HeatRisk

The NWS also runs a tool called HeatRisk, at wpc.ncep.noaa.gov/heatrisk. It is a color-coded, numbered forecast of how risky the heat will be for health, from today through seven days out. It doesn't replace the watches, warnings and advisories above; the NWS calls it an extra tool, and as of October 2026 it still labels HeatRisk "experimental." I like it because it answers the question I actually care about: "How careful do I need to be this week?"

Level	Color	What it means
0	Green	Little to no risk from the expected heat.
1	Yellow	Minor risk, mainly for people who are very sensitive to heat and don't have cooling or enough fluids.
2	Orange	Moderate risk for heat-sensitive people, especially those without cooling or fluids.
3	Red	Major risk for anyone without cooling or fluids.
4	Magenta	Extreme risk: rare or long-lasting extreme heat with no relief overnight.

Tip: Check the forecast every morning during summer, not just when a heat wave is in the news. Two hot days in a row can sneak up on you.

Before: get ready for hot weather

Most of your heat prep can be done in a weekend, and a lot of it is free.

Find your cool places

Your number one heat plan is knowing where you'll go to cool off if your home gets too hot. Ready.gov suggests public places with air conditioning, like libraries and shopping malls, and says to contact your local health department to find cooling centers in your area. A cooling center is a public building that opens as a place to get out of the heat during dangerous weather.

- Find out how your city or county announces cooling centers (website, local alerts, radio). Chapter 6 covers signing up for local alerts.
- Know how you'd get there if you don't drive. If getting there is a problem, ask your local health department what help is available.
- Pick a backup: a friend or relative with air conditioning who'd let you spend the afternoon.

Keep the heat out of your home

Ready.gov lists simple steps to keep a home cooler:

- Cover windows with drapes or shades, especially windows that get afternoon sun.
- Weather-strip doors and windows so cool air stays in.
- Use window reflectors that bounce heat back outside.
- Add insulation, and consider an attic fan or powered attic ventilator.
- Insulate around window air conditioners so they work better.

If you can't afford cooling or energy repairs, Ready.gov points to the Low Income Home Energy Assistance Program (LIHEAP), which can help eligible households with energy bills. Chapter 24 covers LIHEAP and other money help.

Don't count on a fan alone

You might ask, "Isn't a fan good enough?" Not in real heat. Ready.gov says not to rely on a fan as your main cooling device: fans move air, but they don't lower your body temperature. The NWS goes further: use a fan only when the heat index is below the high 90s, because at higher temperatures a fan can make you hotter. A fan is fine on a warm evening. During a heat wave, you need air conditioning, even if it's only a few hours a day at a library or a cooling center.

Get your air conditioning checked

If you have central air or window units, test them before the first hot spell, not during it. Clean or replace filters. If you're a renter, report a broken unit early and in writing. Whether a landlord must provide cooling depends on your state and local rules, so check your local housing office if you run into trouble.

Plan for the people around you

- Talk with older relatives and neighbors now. Agree on a daily check-in by phone or a knock on the door during hot weather.
- If you take medicine that has to stay cool, ask your pharmacist how to store it in heat and during a power outage. Chapter 8 covers medications.
- If someone in your home uses a medical device that needs power, read Chapter 10 and have a backup plan.

During: staying safe in extreme heat

When heat is on the way, here's what to do, roughly in order of importance.

1. Get to air conditioning. If your home doesn't have it, go to a cooling center or another cool public place for the hottest part of the day.
2. Drink plenty of fluids. The CDC says to drink plenty of fluids even if you don't feel thirsty. Water is best. If your doctor limits your fluids, ask how much is right for you in hot weather.
3. Check on others. Ready.gov says to check on family members, older adults and neighbors. Do it at least once a day, and twice for anyone who lives alone.
4. Never leave a person or a pet in a parked car. More on this below.
5. Cool your body. Take cool showers or baths. Wear loose, lightweight, light-colored clothing.
6. Keep the house cooler. Close curtains on sunny windows and use the oven less, since it heats up the whole house. This is a good week for sandwiches and salads.
7. Take it easy outside. Avoid hard outdoor work or exercise during the hottest part of the day. If you must be outside, stay in the shade and wear a hat wide enough to shade your face.
8. Watch for the signs of heat illness in yourself and others (see the table below), and act early.

Tip: Set a phone alarm to drink a glass of water every hour or so on hot days. Thirst is a late signal, and older adults often don't feel thirsty at all.

Never leave anyone in a parked car

Ready.gov is clear: never leave people or pets in a closed car on a warm day. The CDC says the same: never leave children or pets in cars. A parked car heats up fast. In one NWS demonstration, a car went from a safe temperature to an unsafe 94.3 degrees F in just over 2 minutes, and the NWS says leaving the windows slightly open does not slow the heating much.

Busy, tired parents can forget a quiet child in the back seat, especially when the daily routine changes. The National Highway Traffic Safety Administration (NHTSA) suggests a few habits:

- Check the whole car, especially the back seat, every time before you lock it and walk away, even if you're sure it's empty.
- Put something you'll need, like your phone, bag or work badge, in the back seat next to the car seat.
- Ask your child care provider to call you if your child doesn't show up as planned.
- Always lock your car when you aren't using it, even in your own driveway, and keep keys and fobs out of children's reach, so kids can't climb in to play.
- If you see a child alone in a locked car, call 911 right away.

Caution: Never leave a child, an adult who needs care, or a pet alone in a parked car, not even for a minute and not with the windows cracked. If you see a child or vulnerable person alone in a hot car, call 911.

Outdoor workers

If you work outside, or in a hot building, heat illness is a real job hazard. The National Institute for Occupational Safety and Health (NIOSH), part of the CDC, gives employers and workers these basics:

- Drink often. For moderate work in the heat lasting less than 2 hours, NIOSH says about 1 cup (8 ounces) of water every 15 to 20 minutes. Don't go over about 6 cups an hour. If you sweat for several hours, add sports drinks with electrolytes.
- Take rest and water breaks when you feel heat discomfort, and spend recovery time in a cool area.
- Ease in. New workers, and anyone coming back after time away, need time to get used to the heat. NIOSH says to build up time in hot conditions gradually over 7 to 14 days.
- Use a buddy system. Watch your coworkers for signs of heat illness, and have them watch you. Speak up early.

The Occupational Safety and Health Administration (OSHA) is the federal agency that enforces workplace safety rules. If you think your job is putting you in danger from heat, talk to your employer first.

Pets in the heat

Ready.gov says to give pets plenty of cool water and shade, and reminds us that asphalt and dark pavement can get very hot on their feet. Walk dogs early in the morning or late in the evening. Put your hand on the pavement for a few seconds: if it's too hot for your hand, it's too hot for their feet. Bring outdoor pets inside when you can. Chapter 5 covers a pet emergency kit.

Heat illness: know the signs and what to do

Heat illness runs from mild to deadly. Learn the difference between heat exhaustion and heat stroke. One means "cool off and rest." The other means "call 911 now." The table below follows the CDC's guide to heat-related illness.

Condition	What to look for	What to do
Heat stroke (emergency)	Body temperature 103 F or higher; hot, red, dry or damp skin; fast, strong pulse; headache; dizziness; nausea; confusion; passing out	Call 911 right away. Move the person to a cooler place. Cool them with cool cloths or a cool bath. Do not give them anything to drink.
Heat exhaustion	Heavy sweating; cold, pale, clammy skin; fast, weak pulse; nausea or vomiting; muscle cramps; tiredness or weakness; dizziness; headache; fainting	Move to a cool place. Loosen clothing. Put cool, wet cloths on the body or take a cool bath. Sip water. Get medical help right away if the person throws up, gets worse or feels sick for more than 1 hour.
Heat cramps	Heavy sweating during hard activity; muscle pain or spasms	Stop the activity and move somewhere cool. Drink water or a sports drink. Wait for cramps to go away before starting again. Get medical help if cramps last more than 1 hour, you're on a low-sodium diet or you have heart problems.
Sunburn	Painful, red, warm skin; sometimes blisters	Stay out of the sun until it heals. Use cool cloths or a cool bath and moisturizing lotion. Don't break blisters.
Heat rash	Red clusters of small blisters that look like pimples, usually on the neck, upper chest, groin or in elbow creases	Stay in a cool, dry place. Keep the rash dry. Powder, such as baby powder, can soothe it.

Heat stroke can come on fast. NIOSH says body temperature can rise to 106 degrees F or higher within 10 to 15 minutes, and that heat stroke can cause permanent disability or death if the person does not get emergency treatment. Don't wait to see if it passes.

While you wait for help with a heat stroke victim, cool them as fast as you can. Ready.gov and the NIOSH guidance both say to put cold, wet cloths or ice on the head, neck, armpits and groin. Take off extra clothing. Stay with the person until help arrives.

Caution: Confusion, slurred speech or passing out in the heat means heat stroke until proven otherwise. Call 911 first, then start cooling the person. Do not give fluids to someone who is confused or not fully awake.

This book is not medical training. A first aid class from the American Red Cross or the American Heart Association covers heat illness and is well worth a Saturday morning. Chapter 8 covers first aid basics.

When the power goes out in a heat wave

A power outage during extreme heat is one of the more dangerous situations in this book, because you lose your cooling at the worst possible time.

If the power goes out on a hot day:

- Go somewhere cool. If the outage is local, a cooling center, library, store or a relative's house in another neighborhood may still have power.
- Keep curtains and blinds closed on the sunny side of the house.
- Check on neighbors who are older, live alone or depend on medical equipment.
- Keep drinking water. If your water comes from a well with an electric pump, your stored water matters now. Chapter 3 covers storing water.
- Keep the fridge and freezer closed. Chapter 4 explains how long food stays safe.
- If you run a generator, it goes outside only, at least 20 feet from any door, window or vent, as Chapter 10 explains. Generator exhaust contains carbon monoxide, a poison gas.

Caution: Never run a generator, grill or camp stove inside your home, garage, basement or shed, even with the doors open. Chapter 10 covers generator safety.

After a heat wave

When the heat breaks, take a moment to check in:

- Call or visit the neighbors you were watching. Someone who struggled through the heat may still feel weak or dehydrated.
- Throw out any food that sat too long without refrigeration during an outage (Chapter 4).
- Ask yourself what was hardest. Did the bedroom get too hot to sleep? Did you not know where the cooling center was? Fix that now, while it's fresh.
- If someone in your home takes medicine that needs to stay cool and it got warm, call your pharmacist before using it.

Drought

Drought.gov, the federal drought website, defines drought as a lack of rain or snow over an extended period, usually a season or more, that leads to a water shortage. Unlike a heat wave, it creeps in slowly and can hang on for a long time. For most households, drought doesn't mean the tap runs dry. It means water rules, higher costs, and a greater risk of wildfire.

What drought means for your household

- **Water restrictions.** Your water utility or local government may limit lawn watering to certain days, ban washing cars at home or set other limits. Follow them. Fines are possible, but the bigger reason is that everyone shares the same supply.
- **Wildfire risk.** Dry grass, brush and trees burn easily. During drought, be extra careful with anything that makes a spark: mowers, trailer chains, campfires and outdoor burning. Chapter 14 covers wildfire.
- **Well owners.** The CDC says people who get drinking water from private wells may be at higher risk for drought-related illness, because germs can pollute groundwater when rainfall drops. If your water changes in taste, smell or color, or you're worried, have it tested. Your local or state health department can tell you how.
- **Food and prices.** The CDC notes that low crop yields can lead to rising food prices and shortages. That's one more reason to build your food supply a little at a time (Chapter 4).

Saving water at home

You don't have to wait for restrictions to use less water. A few habits make a difference:

- Fix leaky faucets and running toilets.
- Water lawns and gardens early in the morning or in the evening, when less water evaporates.
- Run the dishwasher and washing machine only with full loads.
- Take shorter showers.
- Keep a pitcher of drinking water in the fridge instead of running the tap until it gets cold.

Saving water shouldn't mean cutting corners on keeping clean. The CDC says conservation should not get in the way of handwashing and sanitation, and suggests low-flow faucet aerators as one way to use less water.

Where to check drought conditions

The U.S. Drought Monitor is a national map that shows where drought is happening and how intense it is. You can see it at drought.gov. It sorts conditions into five levels: D0 (abnormally dry, an area going into or coming out of drought), D1 (moderate drought), D2 (severe drought), D3 (extreme drought) and D4 (exceptional drought, the most intense). A new map comes out every Thursday morning. Your state and your water utility will post any water restrictions that apply to you.

Special notes

Older adults

If you're an older adult, have a heat plan with a named person who will check on you every day during a heat wave. Keep a list of your medicines handy and ask your doctor whether any of them make heat harder on you. Don't wait until you feel thirsty to drink.

People with disabilities and medical needs

People who use power-dependent medical equipment, who have trouble moving around or who can't easily sense heat need a plan for getting to a cool place and for power outages. Chapter 2 and Chapter 10 cover these plans.

Kids

Babies and young children depend on you to notice when they're too hot, because they can't always tell you what's wrong. Dress them lightly, keep them in the shade and offer fluids often. Keep playtime outside for the cooler morning and evening hours.

Renters

Know your building's rules about window air conditioners before you buy one. If your unit or building has no cooling and it's dangerous, know where your nearest cooling center is and go.

Mobile and manufactured homes

If you live in a mobile or manufactured home, shades on sunny windows and a working air conditioner matter a lot. If yours gets too hot, leave for a cooling center or another cool place during the hottest hours.

Quick checklist

- ☐ Sign up for local alerts and learn the heat alert terms (Heat Advisory, Extreme Heat Watch, Extreme Heat Warning).
- ☐ Find your nearest cooling center and a backup cool place, and know how you'll get there.
- ☐ Test your air conditioning and clean or replace filters before summer.
- ☐ Add window shades or covers on sunny windows.
- ☐ Set up a daily heat check-in with older relatives and neighbors.
- ☐ Learn the difference between heat exhaustion and heat stroke (heat stroke means call 911).
- ☐ Make "look in the back seat" a habit every time you leave the car.
- ☐ Ask your pharmacist how heat affects your medicines and how to store them.
- ☐ Check drought conditions and follow your local water rules.

Chapter 19: Pandemics and Disease Outbreaks

Most of the emergencies in this book come with wind, water or fire. A disease outbreak is different. Your house is fine, the power is on and the roads are open, but schools close, work changes, store shelves get thin and everyone in the house is worried about getting sick. Most of us lived through the COVID-19 pandemic, so we already know how much it can turn daily life upside down.

This chapter is about the practical side: how germs spread, the everyday habits that slow them down, what to keep at home, how to care for a sick person without everyone else getting sick, and how to keep your household steady through weeks of disruption. I'm not going to tell you which vaccines to get or which medicines to take. That's a conversation for you and your doctor. What I can do is help you be the household that's calm, stocked and ready to help the neighbors.

What an outbreak and a pandemic are

An outbreak is when more people than usual get the same illness in one place or one group. An epidemic is a bigger outbreak that spreads across a wider area. A pandemic, as Ready.gov describes it, is a disease outbreak that spans several countries and affects a large number of people. Pandemics are usually caused by viruses that spread easily from person to person, and Ready.gov points out that a new virus can appear anywhere and spread around the world quickly.

You might ask, "If it's worldwide, what can one household do?" Quite a lot, actually. Pandemics are slowed down by millions of small choices made at kitchen tables: washing hands, staying home when sick, and not passing the illness along to the next person. Your household is part of that.

How diseases spread

Ready.gov lists the main ways germs travel:

- From person to person, often through the air when people cough, sneeze, talk or breathe close together.
- By touching contaminated objects and surfaces, then touching your eyes, nose or mouth.
- From people who are infected but don't have any symptoms yet, or never get them.

That last one is why outbreaks are hard to stop. Someone can feel fine and still pass a virus along. It's also why the habits below matter even when nobody in your house feels sick.

Where to get trustworthy information

During an outbreak, rumors spread almost as fast as the germs. Ready.gov says to follow the latest guidance from the Centers for Disease Control and Prevention (CDC) and to check with your state and local health departments for updates on vaccines and testing. Your local health department knows what's happening in your county, which may be very different from the national news.

Ready.gov warns that sharing bad information about a disease or its treatments can lead to serious health problems. Before you forward something, ask yourself where it came from. If it isn't from a health department, the CDC or your own doctor, let it go. Ready.gov also reminds us that stigma hurts everyone. Stigma means blaming or shunning a group of people for an illness. Germs don't care who you are.

Tip: Bookmark your state and county health department websites now, and sign up for their alerts if they offer them. Chapter 6 covers local alerts.

Before: get your household ready

Build up supplies a little at a time

Ready.gov suggests gathering supplies in case you need to stay home for several days or weeks, such as cleaning supplies, non-perishable food, prescriptions and bottled water. It also says to buy them slowly, so everyone has the chance to get what they need. That's good advice for your budget as well. Nobody needs to clear out a store in one trip.

If you've built the home supplies in Chapters 3, 4 and 5, you're most of the way there. For an outbreak, here are the health items I'd add:

Item	Why
A thermometer	To check for fever and know when someone is improving.
Fever and pain reducers your household already uses	Ask your doctor or pharmacist which are right for each person, including children.
Extra tissues, soap and hand sanitizer	For handwashing and covering coughs.
Well-fitting masks	For a sick person in a shared home, or when health officials advise them.
Household cleaner and disinfectant	For cleaning high-touch surfaces.
Disposable gloves and trash bags	For handling a sick person's tissues and laundry.
Easy foods and drinks for a sick person	Soup, crackers and drinks that are easy on the stomach.
A list of each person's medicines and doctors	So anyone in the house can call in a refill or answer a nurse's questions.

Keep your medicines on hand

Talk with your doctor and pharmacist about how to keep enough of your regular medicines on hand in case it's hard to get to the pharmacy. Ask about mail-order or delivery. Chapter 8 covers managing medications in an emergency.

Check your health insurance and telehealth

Ready.gov suggests reviewing your health insurance, including whether it covers telemedicine. Telemedicine, also called telehealth, means seeing a doctor or nurse by phone or video. It lets you get advice without sitting in a waiting room full of sick people. Find out now how your plan handles it, and save the phone number of your doctor's office and any nurse advice line on your insurance card.

Plan for closures

During an outbreak, schools, child care, workplaces and community centers may close. Ready.gov says to prepare for that, including ways to do school, work and social activities online, and working from home (telework) if that's possible for your job. A few questions to answer as a family:

- Who will watch the kids if school or child care closes for weeks?

- Can your job be done from home? If not, what's the plan if you get sick or your workplace closes?
- Who will check on older relatives who live alone?
- How will you get groceries and medicines if someone in the house is sick?

Chapter 2 walks through a family emergency plan, and Chapter 24 covers money trouble and lost work.

Protect your documents and watch for scams

Ready.gov recommends keeping password-protected digital copies of important documents and watching out for scams and fraud. Outbreaks bring fake cures, fake test kits, fake charities and phone calls pretending to be from health agencies. If someone contacts you out of the blue asking for money or personal information, hang up and call the agency at a number you look up yourself. Chapter 24 covers avoiding scams.

Everyday habits that slow the spread

These are the habits that protect you all year, not only during a pandemic.

Wash your hands

Ready.gov says to wash your hands with soap and water for at least 20 seconds. That's about as long as humming "Happy Birthday" twice. If soap and water aren't available, use a hand sanitizer that contains at least 60 percent alcohol. And try not to touch your eyes, nose and mouth, which is harder than it sounds.

Cover coughs and sneezes

Cover your mouth and nose with a tissue or the inside of your elbow, throw the tissue away and wash your hands.

Stay home when you're sick

This is the big one. Ready.gov says to stay home when you're sick, except to get medical care. The CDC's current guidance for common respiratory viruses (the ones that cause colds, flu and similar illnesses) says that if you have symptoms, stay home and away from others, including people you live with who aren't sick.

The CDC says you can go back to your normal activities when both of these have been true for at least 24 hours:

1. Your symptoms are getting better overall.
2. You have not had a fever, and you are not using fever-reducing medicine.

Then, for the next 5 days, the CDC recommends taking added precautions when you'll be around other people: cleaner air (like opening windows), good hand hygiene, wearing a well-fitting mask, keeping your distance, or testing. These steps matter most around people who are at higher risk of severe illness. The CDC explains that you may still be able to spread a virus after you feel better.

If your fever comes back or you get worse after you go back out, the CDC says to stay home and away from others again, then start over once you meet the 24-hour test.

> **Caution:** These rules are for everyday respiratory illnesses. During a new outbreak, your health department may give different instructions about staying home, testing or quarantine. Follow the current official guidance.

Masks

Masks have a simple job: they help keep the germs you breathe out from reaching other people, and help reduce what you breathe in. The CDC's current guidance for respiratory viruses lists wearing a well-fitting mask as one of the added precautions when you're getting over an illness and will be around others, and when you're sick at home and can't fully stay apart from the people you live with.

During a large outbreak, health officials may recommend masks more widely, such as in public places. Ready.gov's pandemic page says to wear a mask in public and to keep at least six feet away from people outside your household. Whether those steps apply to you depends on the situation, so follow the guidance from your health department at the time.

Vaccines

Ready.gov lists getting vaccinated as one of the steps to take during a pandemic. Vaccines are a personal health decision. Talk with your doctor or pharmacist about which ones are recommended for you and your family, and check your state or local health department for where to get them.

Clean high-touch surfaces

Ready.gov says to clean and disinfect objects and surfaces that people touch often. Think doorknobs, light switches, faucet handles, phones, remote controls and counters. Follow the directions on the product label, including how long the surface needs to stay wet, and never mix cleaning products. Chapter 20 explains why mixing chemicals is dangerous.

During an outbreak

Here's what to focus on when an outbreak hits your area, in rough order:

1. Follow official guidance. Check the CDC and your state and local health departments for current instructions on testing, vaccines and closures.
2. Keep up the everyday habits above: handwashing, covering coughs and staying home when sick.
3. Use your supplies instead of making extra trips. Restock a little at a time.
4. Check on neighbors and relatives by phone or text, especially older adults and people who live alone. Offer to drop groceries or medicine at their door.
5. Keep kids on a routine as best you can, even if school is closed.
6. Look after your mental health (more below).

If you were exposed

If you find out you were around someone who's sick, Ready.gov says to contact your doctor, follow any quarantine instructions you're given and watch for symptoms.

When to get medical help

Keep an eye on symptoms for anyone who is sick. The CDC says that if someone has an emergency warning sign, such as trouble breathing or chest pain, get emergency medical care right away. Ready.gov says that in a medical emergency, call 911, then stay where you are and wear a mask, if possible, until help arrives.

For anything less urgent, call your doctor's office or a nurse advice line first. They can tell you whether you need to be seen and where to go, and you won't expose a waiting room full of people.

Caution: Trouble breathing or chest pain is an emergency. Call 911.

Caring for a sick person at home

Most people who catch a common respiratory illness get better at home. Caring for them well also means protecting everyone else in the house. Here are the basics:

- **Give the sick person their own space.** The CDC says sick people should stay away from others, including people they live with who aren't sick. In most homes that means a bedroom of their own with the door closed, if you can manage it.
- **Keep contact to a minimum.** The CDC's advice for caring for someone with the flu is to keep contact short and avoid being face-to-face with the sick person. The fewer people who spend time with them, the fewer people are exposed. If someone in the house is at higher risk of severe illness, I'd have somebody else do the caregiving.
- **Use masks in shared spaces.** The CDC suggests the sick person wear a well-fitting mask at home to protect others, especially if there isn't space to stay fully apart. A mask on the caregiver, especially when face-to-face, is an added layer of protection.
- **Freshen the air.** The CDC says you can improve indoor air by bringing in fresh outside air or cleaning the air. Opening a window when the weather allows is a simple way to do it.
- **Wash hands often**, especially after touching the sick person or handling their tissues or laundry, as the CDC advises. Hand sanitizer works when soap and water aren't handy.
- **Clean and disinfect high-touch surfaces** they use, like the bathroom faucet and door handles.
- **Let them rest** at home, keep them drinking fluids, and follow their doctor's advice about medicines.
- **Watch for warning signs.** The CDC lists emergency warning signs such as trouble breathing, chest pain and confusion; anyone with them should get medical care right away.

Tip: Set up a "sick room" kit in a box: thermometer, tissues, a trash can with a liner, hand sanitizer, a water bottle, a mask and a notepad to write down temperatures and medicine times. When someone gets sick, you just carry the box in.

Keeping life steady through a long outbreak

A pandemic isn't one bad day. It can be weeks or months of disruption. Pace yourself.

Work and money

If you lose work or hours, apply for help early. Chapter 24 covers unemployment insurance, 211, food help and talking to lenders and landlords before you fall behind.

School at home

If schools close, keep a simple daily routine for kids: regular wake-up time, schoolwork in the morning, time outside, chores and screen limits. It doesn't need to look like a classroom. Ask the school about lending devices or internet help if you need it.

Shopping and errands

Shop less often and buy a little more each trip, rather than rushing out for everything at once. Ready.gov's reminder to buy gradually applies here: if everyone buys only what they need, there's enough to go around. If you're sick or at high risk, ask a neighbor or use delivery and curbside pickup where available.

Mental health

Ready.gov says it's normal to feel anxious or stressed during a pandemic. It suggests staying connected with people by video and phone calls, taking care of your body, and talking to someone if you feel upset. A few things help most households:

- Limit how much news you watch. Check a trusted source once or twice a day, then turn it off.
- Keep moving. A walk around the block counts.
- Keep regular meals and sleep.
- Stay in touch with friends and family, even if you can't visit.
- Reach out if you're struggling. Chapter 8 lists free, confidential crisis lines.

Kids pick up on adult worry. Answer their questions honestly in words they understand, tell them what your family is doing to stay safe and keep their routine as normal as you can.

After an outbreak

When an outbreak eases, Ready.gov suggests keeping up the protective habits: stay home when sick (except to get medical care), follow your health care provider's advice, cover coughs and sneezes, and keep washing your hands with soap and water for at least 20 seconds. It also suggests updating your family emergency plan and talking about lessons learned so you're better prepared next time.

That last part is worth doing at the kitchen table. What ran out first? What would you stock differently? Who in the neighborhood needed help, and how could you reach them faster next time? Write it down and add it to your plan.

Special notes

Older adults and people with health conditions

People at higher risk of severe illness should talk with their doctor before an outbreak about what to watch for, which medicines to keep on hand and when to call. Line up a helper who can drop off groceries and prescriptions so you can stay home when illness is spreading.

People with disabilities

If you rely on a personal care aide, plan a backup in case your aide gets sick. Keep a written list of your daily care needs that someone new could follow. Chapter 2 covers planning for access and functional needs.

Kids

Teach handwashing early and make it fun. Show kids how to cough into their elbow. Have a plan for who will care for them if a parent gets sick.

Pets

Pets need care even when the household is sick. Keep a couple of weeks of pet food and medicine on hand and line up a friend who could step in. Chapter 5 covers a pet kit.

Renters and shared housing

In apartments and shared homes, you share hallways, laundry rooms and elevators. Wash hands after using shared spaces, and talk with roommates ahead of time about how you'd handle someone getting sick.

Quick checklist

- ☐ Bookmark your state and local health department websites and sign up for their alerts.
- ☐ Build several days to weeks of food, water, cleaning supplies and prescriptions, a little at a time.
- ☐ Add a thermometer, fever reducers, tissues, soap, hand sanitizer and masks to your supplies.
- ☐ Ask your doctor or pharmacist how to keep extra medicine on hand.
- ☐ Check whether your health plan covers telehealth and save the phone numbers.
- ☐ Make a plan for school, child care and work closures.
- ☐ Practice washing hands for at least 20 seconds with your kids.
- ☐ Pick a sick room and one caregiver for your household.
- ☐ Set up phone check-ins with older relatives and neighbors.

Chapter 20: Chemical and Hazardous Materials Accidents

Chemicals are everywhere in modern life. They ride past your town on trucks and freight trains, flow under fields in pipelines, sit in tanks at factories and water treatment plants, and wait under your kitchen sink. Nearly all of the time, they stay where they belong. Once in a while there's a crash, a derailment, a fire or a leak, and officials tell nearby households to stay inside or to leave.

This chapter explains how those warnings work and what to do with them: how to shelter in place and seal a room, when to leave, how to get a chemical off your body, how to stay safe with the cleaners in your own home, and how to find out what's stored and moved near where you live. Most of this is simple. The key is knowing it before you need it, because a chemical emergency moves fast.

In nearly forty years of utility work, safety around hazardous materials was drilled into us. Most families never think about the rail lines or highways running through their town until a tanker spills. Knowing how to shelter in place, shut off your heating and air system and seal doors and windows gives you immediate protection.

What a hazardous materials accident is

Hazardous materials, often shortened to "hazmat," are substances that can harm people, animals or the environment if they get loose. They include fuels, industrial chemicals, pesticides, gases like chlorine and ammonia, and many everyday products in large amounts.

A hazmat accident is any spill, leak, fire or release of these materials. Some put a cloud of gas or smoke into the air. Others spill liquids onto roads, into waterways or into soil.

Where they happen

You might ask, "I don't live near a chemical plant. Does this apply to me?" Probably. Accidents can happen in places most people don't think about:

- Highways and interstates, where tanker trucks carry fuel and chemicals.
- Railroads, where freight trains haul tank cars through towns of every size.
- Factories, refineries, warehouses and storage yards.
- Water and wastewater treatment plants, which use chemicals like chlorine.
- Farms and farm supply stores, which store fertilizers and pesticides.
- Pipelines that carry natural gas, oil and other fuels underground.
- Your own home, garage and shed.

Chapter 1 explains how to look up the hazards near your home, including rail lines, highways and industrial sites.

Alerts and the words you'll hear

In a chemical emergency, local officials, usually police, fire or emergency management, decide what nearby people should do. You'll hear the news through the channels covered in Chapter 6: Wireless Emergency Alerts

on your phone, local alert systems you've signed up for, radio, TV and sometimes sirens or officers going door to door.

They'll usually give one of two instructions:

- **Shelter in place.** Stay inside, close up the building and seal off a room to keep outside air out.
- **Evacuate.** Leave the area now, by the route they tell you.

Which one you get depends on the chemical, the wind, how long the release will last and how close you are. The Centers for Disease Control and Prevention (CDC) explains that during some chemical emergencies, such as a train derailment, it may be safer to stay put and seal off the space than to leave. That's why it matters to follow the instruction you're given, not your gut. If the officials say leave, leave. If they say stay in, stay in. They can see things you can't.

Caution: Follow the instructions of police, fire or other local officials. Do not go toward an accident scene to look, and do not leave a shelter-in-place until officials give the "all clear."

Before: get ready

Pick your safe room

The CDC suggests choosing a room you can seal off from outside air. It should have few or no windows, be as far from the outside as possible, be at the highest point in the building, and have a water source if possible. The CDC's planning tips add that a large room is better.

You might ask, "Highest floor? I thought you go low in an emergency." For a tornado, yes (Chapter 12), and for radiation you head to the middle of the building or the basement (Chapter 21). For a chemical release, the CDC says to go up. Different hazards, different rooms, which is why it's worth knowing ahead of time.

A big bathroom upstairs often works well, because it has water and usually small windows. In a one-story home, pick an inside room with the fewest windows.

Build a sealing kit

The CDC recommends a sealing kit with:

- ☐ Duct tape
- ☐ Scissors
- ☐ Towels
- ☐ Plastic sheeting, 2 to 4 mil thick, cut ahead of time to fit your safe room's windows and labeled so you know which piece goes where

Keep the kit in or near your safe room so you're not hunting for it. "Mil" is the unit used to describe how thick plastic sheeting is; check the package when you buy it.

The CDC also suggests practicing how you'd seal window air conditioners, bathroom and kitchen exhaust fans, and stove and dryer vents. A dry run on a Saturday afternoon will show you what you're missing.

Go kits and supplies

The CDC suggests having go kits ready, one for your home and one for your vehicle, plus kits for pets. Include large and small trash bags and several pairs of disposable gloves; you'll see why in the "getting clean" section. Your home and car kits from Chapter 5 cover the rest.

Make a contact plan

Plan how your household will stay in touch if you're separated. The CDC suggests telling someone outside your area where you are, and notes that you may need to use text messages or social media. Chapter 2 covers family contact plans.

> **Tip:** Tape a copy of your shelter-in-place steps inside the safe room door. In the moment, a short list is easier to follow than your memory.

During: if you're told to shelter in place

Move quickly. Here's what to do at home, based on the CDC's steps:

1. Bring pets inside.
2. Close and lock all windows and doors.
3. Turn off the fan, air conditioner and furnace. Close the fireplace damper.
4. Grab your go kit, your medicines and your pets' medicines, your phone and charger.
5. Go to your safe room and shut the door.
6. Seal the room. Tape plastic sheeting over the windows, tape over vents and tape around the door. If you don't have plastic sheeting, stuff towels, sheets or clothing into the vents and under the door.
7. Keep a radio, TV or news app on for updates.
8. Text or call your out-of-area contact to say where you are and that you're safe.
9. Stay put until officials give the "all clear."

The CDC says you may need to stay for a few hours, possibly a few days or longer. That's one more reason your safe room should have water and your go kit should be inside it with you.

For pets in the safe room, the CDC suggests removing plants that could hurt them and closing off small spots where they could hide or get stuck, such as under heavy furniture.

If you're at work or school

Follow the building's emergency plan and the instructions of the staff in charge. Schools have their own emergency plans. My advice: don't rush to the school to pick up your children unless officials tell you to; you could drive right into the danger. Find out your school's emergency plan ahead of time (Chapter 2).

If you're in a vehicle

The CDC warns that cars, trucks and other vehicles may not be airtight enough to protect you. Use the radio, a news app or phone alerts to find the nearest shelter and go there, following the instructions of local officials.

During: if you're told to evacuate

If officials tell you to leave, go right away and take your go kit, medicines and pets. Chapter 7 covers evacuation in detail. A few points matter most in a chemical emergency:

- Take the route officials give you, even if it's longer. They're steering you around the danger.
- Don't drive into a cloud, smoke or a spill.
- Remember that your car isn't airtight. The CDC warns that vehicles may not protect you from outside air, so keep moving away from the danger and follow officials' directions.

Caution: If you smell a strong odor, see a cloud or spill, or feel your eyes or throat burning, move away from it right away and call 911 once you're safe.

Getting a chemical off your body

If you've been splashed or caught in a chemical release, speed matters. The CDC says the goal is to remove all your clothing and shower, ideally within 10 minutes. Don't worry about which chemical it was. Focus on getting it off.

If you breathed it in, get to fresh air. If you swallowed it, the CDC says do not make yourself throw up and do not drink anything; call for help.

Here are the CDC's steps, in plain terms:

1. Blot, don't rub. Use a moist wipe, wet cloth or damp paper towel on your skin, face, hands and hair.
2. Take off as much clothing as you can, even down to your underwear. The CDC says removing clothing gets rid of 80 to 90 percent of the chemical.
3. Cut off anything that would have to come off over your head. If you can't cut it, hold your breath and close your eyes while you pull it off.
4. Put the clothing in a plastic bag, seal it and put that bag inside a second bag. Put contact lenses in the bag too.
5. Wash your hair, face, hands and skin from head to feet with lukewarm water and mild soap for at least 2 to 3 minutes. Keep water out of your eyes, nose and mouth. Do not scrub.
6. If your eyes burn or your vision is blurry, flush them with water for 10 to 15 minutes. Do not use eye drops.
7. Dry off with anything absorbent, and bag those items the same way.
8. Put on any clean clothes you have.

To help a child or someone else, the CDC says to put on a mask and gloves first, then follow the same steps for them.

Wear gloves when you handle the sealed bags, and keep them in a closed container. The CDC says not to put them in your regular trash; follow the instructions officials give for what to do with them.

When to get medical help

The CDC says to call Poison Control at 1-800-222-1222, call 911, or go to the nearest hospital if you have symptoms or can't get the chemical off, even after following these steps. A pet that was exposed may need a veterinarian.

Caution: If you have any symptoms after a chemical exposure, or can't get the chemical off, call Poison Control at 1-800-222-1222 or 911, or go to the nearest hospital.

Chemical safety in your own home

Most chemical injuries don't come from train wrecks. They happen at home, with ordinary cleaners, pool supplies, garden products and fuels.

Never mix cleaning products

Mixing cleaners can be dangerous. The CDC's rule is short: never mix bleach with ammonia or any other cleaner. Read labels so you know what is in each product. The safest habit is to use one product at a time and rinse between them. The CDC also says to open windows and doors for fresh air when you use cleaning products indoors, try not to breathe in the fumes, and wear gloves and eye protection.

Caution: Never mix bleach with ammonia or any other cleaner. If you feel sick, cough or have trouble breathing after cleaning, get to fresh air and call Poison Control at 1-800-222-1222, or 911 in an emergency.

Store chemicals safely

- Keep products in their original containers with the labels on. Never put chemicals in food or drink bottles.
- Store them up high or locked away from children and pets.
- Keep fuels, like gasoline and propane, outside the living space and away from anything that makes a spark or flame. Chapter 9 covers fuel storage.
- Read and follow the label every time. It tells you how to use, store and get rid of the product safely.
- Get rid of old chemicals through your local household hazardous waste collection, not down the drain.

Save the Poison Control number

The CDC lists the Poison Control Center number as 1-800-222-1222. Put it in every phone in the house and on the fridge. Call it if anyone swallows, breathes in or gets a chemical on their skin or in their eyes and you're not sure what to do. In a life-threatening emergency, call 911.

Pipelines

Many pipelines run under neighborhoods, farms and roads, carrying natural gas, oil and other fuels. According to the Pipeline and Hazardous Materials Safety Administration (PHMSA), the federal agency that oversees pipeline safety, many buried pipelines are marked by signs above ground that show their approximate route. The markers show the company that runs the line, what it carries and an emergency phone number. You'll often see them where a pipeline crosses a street, highway or railroad.

Call 811 before you dig

Digging can damage buried pipelines and utility lines. PHMSA says homeowners and professionals alike should call 811, the national "call before you dig" number, before digging, even for small projects like planting trees or shrubs. The call is free. The 811 center notifies the companies with buried lines near your site, and they come out and mark where their lines are with flags or paint. Every state requires by law that you call ahead, usually 48 to 72 hours before you dig; check your state's rule.

Signs of a pipeline leak

PHMSA says to use your senses. Signs of a leak can include:

- **Sight:** pools of liquid, discolored or unusually dry soil or plants, steady bubbling in wet or flooded ground, an oily sheen on water, a fog or mist of vapor, dirt blowing into the air, or fire coming out of the ground.
- **Sound:** anything from a quiet hiss to a loud roar.
- **Smell:** an unusual, petroleum or gas-like odor. PHMSA notes that gas delivered to homes has an odor added (mercaptan) that smells like a skunk. Some large gas lines and some fuels have no smell at all, so don't rely on your nose alone.

If you suspect a leak

PHMSA's steps, in plain terms:

1. Turn off gas appliances.
2. Leave the area on foot right away. Don't try to find the source of the leak.
3. Tell others to leave too, and try to stay upwind. Upwind means the side the wind is coming from, so the wind blows past you toward the leak instead of carrying gas toward you.
4. Once you're in a safe place, call 911. Then call the pipeline company, using the number on a nearby marker, and give your name, phone number, location and a short description.

PHMSA also lists what not to do:

- Don't touch any leaking liquid or gas.
- Don't open or close pipeline valves. That could make things worse.
- Don't make a spark or flame: no matches, no light switches, no starting cars or electric equipment.
- Don't use a phone, including a cell phone, near the leak.
- Inside a building, don't unplug appliances or open an automatic garage door.
- Don't ring doorbells to warn neighbors. Knock by hand.
- Don't drive into the leak or a vapor cloud while you're leaving.
- Don't try to put out a natural gas fire. Wait for trained firefighters.

Caution: If you smell gas or hear a hiss or roar near a pipeline, leave on foot first and call 911 from a safe distance. Don't flip switches, start a car or use your phone near the leak.

Know what's near you

A federal law called the Emergency Planning and Community Right-to-Know Act (EPCRA) sets up a Local Emergency Planning Committee (LEPC) for each of the more than 3,000 local and tribal emergency planning districts around the country. According to the Environmental Protection Agency (EPA), each LEPC must

include, at a minimum, elected officials; police, fire, civil defense and public health professionals; environment, transportation and hospital officials; representatives of local facilities; and representatives of community groups and the media.

Your LEPC has to write an emergency response plan for chemical accidents in your area and review it at least once a year. It's also required to provide the public with information about chemicals in the community. That makes it a good place to ask what's stored near you and what the plan is if something goes wrong.

To find your LEPC, the EPA says to contact your State Emergency Response Commission. Your county emergency management office can usually point you to the right people too.

A few other questions worth asking:

- Is there a rail line, interstate or major truck route within a mile or two of your home, work or kids' school?
- Are there factories, chemical storage sites, refineries or water treatment plants nearby?
- Does your community use sirens for chemical emergencies, and what do they sound like?
- What is your kids' school's shelter-in-place plan?

After: when the danger has passed

- Wait for the "all clear" from local officials before you go outside, and follow their instructions when you do.
- If you were told to evacuate, don't go home until officials say it's safe. Chapter 7 covers coming home.
- Ask officials how to clean up any chemical residue around your home, and how to get rid of contaminated clothing and supplies you bagged.
- If you or anyone in your household feels sick, call your doctor or Poison Control, and tell them about the chemical exposure.
- Follow any instructions about your drinking water, garden produce or livestock if the release could have affected them.
- Pets may need to see a veterinarian if they were exposed.

Special notes

Kids

Practice your shelter-in-place drill with children so it feels routine rather than scary. Give them a job, like bringing the pets to the safe room or grabbing the towels. If a child is exposed to a chemical, the CDC says to put on a mask and gloves and follow the same getting-clean steps for them.

Older adults and people with disabilities

If you'd need help reaching an upstairs safe room, pick the best room on the floor you can get to and keep your sealing kit there. Keep medicines and any power-dependent equipment within reach of your safe room. Tell a neighbor or relative ahead of time if you'd need help evacuating. Chapter 2 covers planning for access and functional needs.

Pets

The CDC suggests a go kit for your pets as well as yourself. Bring pets inside at the first warning and keep them with you in the safe room. After an exposure, pets may need a veterinarian.

Renters and apartment dwellers

In an apartment, you may not control the building's heating and cooling system. Close your own windows, turn off any fans and window units you control, and seal your safe room. Ask your building manager ahead of time how the building handles shelter-in-place orders.

Mobile and manufactured homes

Mobile and manufactured homes may let in more outside air. If you're told to shelter in place, seal your safe room as well as you can, and stay tuned to officials in case they tell you to move.

Quick checklist

- ☐ Learn what rail lines, highways, pipelines and chemical sites are near your home, work and school.
- ☐ Choose a safe room: few or no windows, away from outside walls, as high up in the building as you can get, with a water source if possible.
- ☐ Build a sealing kit: duct tape, scissors, towels and pre-cut plastic sheeting.
- ☐ Practice sealing your safe room once.
- ☐ Add trash bags and disposable gloves to your go kits.
- ☐ Learn the steps to get a chemical off your body.
- ☐ Save Poison Control (1-800-222-1222) in every phone.
- ☐ Never mix cleaning products, and store chemicals locked away in their original containers.
- ☐ Call 811 before any digging project.

Chapter 21: Nuclear and Radiation Emergencies

This chapter covers emergencies where radioactive material gets loose: an accident at a nuclear power plant, a "dirty bomb," a spill from a truck or train carrying radioactive material, and the rare but serious case of a nuclear explosion. These are not common events. Still, the word "radiation" scares people more than almost any other, and fear makes people do risky things, like jumping in the car to race across town. A little knowledge goes a long way here.

The good news is that the main thing you need to do is simple, and you already know how: go inside a good building, stay there, and listen for instructions. The official short version is three phrases: Get Inside, Stay Inside, Stay Tuned. The rest of this chapter explains why that works and how to do it well.

What a radiation emergency is

Radiation is energy given off by certain materials. In small amounts it is part of everyday life. In an emergency, the problem is radioactive material getting into the open air as dust or tiny particles, where it can land on people, cars, food and buildings, or be breathed in.

Ready.gov lists these kinds of radiation emergencies:

- A nuclear detonation (an explosion of a nuclear weapon).
- An accident at a nuclear power plant.
- A transportation accident involving a shipment of radioactive materials.
- An occupational exposure, such as in a health care or research setting.

You may also hear the term **dirty bomb**. The U.S. Nuclear Regulatory Commission (NRC) describes it as a conventional explosive, such as dynamite, combined with radioactive material. A dirty bomb is not a nuclear bomb, and the NRC says the explosive itself would be more harmful to people than the radioactive material. If one goes off, local officials may tell people to shelter in place or quickly leave the immediate area. Follow what they say.

Two words are worth knowing. **Contamination** means radioactive material is on you or in you, like dust on your clothes, skin and hair. **Fallout** is radioactive dust and debris that falls from the sky after a nuclear explosion. Both can be reduced a great deal by simple steps: getting inside, taking off your outer clothes and washing.

Time, distance and shielding

Officials boil radiation protection down to three ideas. Ready.gov puts it this way: limit your time exposed to radiation, and stay as far away as possible from a radioactive source. The third idea is shielding, which means putting heavy, dense material between you and the radiation. Walls, floors, soil and concrete all count.

Here's how that plays out in real life:

- **Time.** The less time you spend near radioactive material, the less you absorb. That's why you don't go outside to look.
- **Distance.** The farther away, the better. Moving to the middle of a building puts distance between you and the dust settling on the roof and outside walls.
- **Shielding.** Thick walls, a basement, or several floors above and below you block much of the radiation.

You might ask, "Wouldn't it be safer to drive away as fast as I can?" Usually, no. A car offers very little protection, and roads may jam. The Centers for Disease Control and Prevention (CDC) tells people who are outside or in a car to get into a building as soon as they can. If officials tell your area to evacuate, then go, but follow their route and their timing.

Alerts and the words you'll hear

You'll most likely hear about a radiation emergency through Wireless Emergency Alerts on your phone, the Emergency Alert System on TV and radio, local alert sign-ups, or officials on the news. Chapter 6 covers all of these in detail. Ready.gov suggests having more than one way to get alerts, including a battery-powered or hand-crank radio, in case power or cell service is down.

If you live near a nuclear power plant, you may also hear these four emergency levels, which the NRC uses for plants. They go from least to most serious:

Level	What it means in plain words
Notification of Unusual Event	Something has happened that could lower the plant's level of safety.
Alert	Something has happened that could substantially lower the plant's level of safety.
Site Area Emergency	Major plant functions needed to protect the public have failed or are likely to fail.
General Emergency	Serious damage to the reactor fuel has happened or is about to happen. People nearby will likely be told to go indoors and listen for instructions.

The first two levels usually mean "pay attention." The last two are when you should be ready to act on official instructions right away. According to the NRC, in a General Emergency the people within about 2 miles of the plant, and those within 5 miles who are downwind, are evacuated at a minimum. People in the rest of the 10-mile zone around the plant will most likely be told to go indoors and listen to Emergency Alert System broadcasts.

Living near a nuclear power plant

If you live near a nuclear power plant, there's a plan already in place for your area. The NRC sets up two planning areas, called Emergency Planning Zones, around every plant:

Zone	About how far	What it's for
Plume exposure pathway zone	About 10 miles from the plant	Protecting people from breathing in or being exposed to radioactive material in the air. Actions include sheltering, evacuation and potassium iodide pills where appropriate.
Ingestion exposure pathway zone	About 50 miles from the plant	Protecting people from eating or drinking contaminated food and water. Actions include banning contaminated food and water.

In plain terms: if you live within about 10 miles, you might be told to shelter or leave. If you live within about 50 miles, you might be told not to eat certain local farm foods, milk or water until they are tested.

These plans are tested. The NRC requires each plant operator to practice its emergency plan with local and state authorities at least once every two years, and the Federal Emergency Management Agency (FEMA) reviews the off-site parts of those plans.

What should you do if you live in one of these zones? A few simple things:

- Call or check the website of your county emergency management office and ask how they would warn you (outdoor sirens, phone alerts, radio) and whether your area has an evacuation zone or route.
- Ask whether your county or state hands out an emergency information booklet or calendar for people near the plant, and keep it with your important papers.
- Learn your children's school and daycare plans for a radiation emergency.
- Ask your county whether potassium iodide is available for people in your zone (more on that below).

Before: get ready

Most of what you do to prepare for a radiation emergency is the same as for any other emergency. If you've built the kit in Chapter 5 and the plan in Chapter 2, you're most of the way there. Ready.gov adds a few items that matter here:

- ☐ A change of clothes for each person in the family, kept in a closet, drawer or sealed bag.
- ☐ Heavy-duty trash bags for contaminated clothing.
- ☐ Sealed food, water and medicine. Food in cans, jars and sealed packages is easy to wipe clean.
- ☐ A battery-powered or hand-crank radio, ideally one that also gets National Oceanic and Atmospheric Administration (NOAA) Weather Radio.
- ☐ A family meeting place and an out-of-area contact.
- ☐ A list of safe places to stay if you're told to evacuate.
- ☐ Your children's school, work and care-facility shelter and evacuation plans.

I'd also think ahead about which buildings near your home, work and school would give the best protection. Think about the places you spend most of your day. Is there a basement? A big concrete building nearby? Knowing that ahead of time saves precious minutes.

If someone in your family relies on power for medical equipment, add the steps from Chapter 10 to your plan. Staying inside for a day or more is much easier when you've already thought about medicines, oxygen and charging.

During: what to do, in order

Here is the order of business. Get inside first. Everything else can wait.

1. Get Inside

1. Go into the nearest building right away. If you're in a car, get out and go into a building. CDC says the walls of your home can block much of the harmful radiation.
2. Move away from windows and toward the middle of the building.
3. Put as many walls as you can between yourself and the outside.

4. If there's a basement, go there. If not, choose the center of the building, away from outside walls and the roof.

Not all buildings protect equally. Ready.gov says the safest buildings have brick or concrete walls. Basements, underground parking garages, subways and the center of large buildings also give good shelter. A large office building or a school with concrete walls is a better choice than a small wood-frame house or a mobile home.

2. Stay Inside

1. Close windows, doors and fireplace dampers.
2. If possible, turn off fans, air conditioners and forced-air heating units that bring air in from outside.
3. Bring pets inside if you can do it quickly.
4. If you were outside when the dust started falling, take off your outer layer of clothing and wash (see "Cleaning yourself off" below).
5. Stay in the most protective spot for the first 24 hours, unless there's an immediate danger such as fire or a gas leak, or officials tell you it's safe to leave.

Why 24 hours? Ready.gov says radiation levels decrease rapidly, becoming much less dangerous, during the first 24 hours. The first day is when shelter does the most good.

> **Caution:** Don't go outside to look, to take pictures, or to check on the car. Every minute outside early on is time spent exposed. Stay in until officials say it's safe, unless you have a life-threatening medical problem.

3. Stay Tuned

Listen to the radio, TV, phone alerts or official social media for instructions. Officials will tell you whether to stay put, when it's safe to come out, and whether to evacuate. If you're told to evacuate, go the way they say, and don't come back until local authorities say it's safe.

"Should I go get my kids from school?"

This is the hardest one for any parent. The answer from CDC is to stay where you are. Schools, daycares, hospitals and nursing homes will keep people inside until responders say it's safe to move. If you drive across town during the first hours, you're outside and in a car, which is the exact opposite of what protects you. Your children are safer sheltered in a sturdy school than riding in your car through falling dust. Talk with your kids ahead of time so they know a grown-up at school will keep them safe and that you will come for them when the officials say it's okay.

If there's a nuclear explosion

A nuclear explosion is the most serious and least likely case. The steps are the same as above, with a few additions from Ready.gov:

1. Take cover from the blast right away, behind or inside anything that might protect you.
2. If you're outside, lie face down to protect exposed skin from the heat and flying debris.
3. As soon as it's safe to move, get inside the nearest building, preferably brick or concrete, and go to the basement or center.

4. Stay in the most protective spot for the first 24 hours unless officials say otherwise.

Tip: Ready.gov says that after a detonation, you'll have 10 minutes or more to find an adequate shelter before fallout arrives. Use those minutes to get inside a good building, not to drive away.

Cleaning yourself off

If you were outside when radioactive material was in the air, you may have dust on your clothes, skin and hair. Cleaning it off is easy, and it works. CDC says taking off your outer layer of clothing can remove up to 90% of radioactive material.

Here are CDC's steps, in plain words:

1. Take off your outer layer of clothing, carefully, so dust doesn't shake loose into the air.
2. Put the clothes in a plastic bag or other sealable container. Put the bag in an out-of-the-way spot, away from people and pets.
3. Take a warm shower if you can. Use soap and shampoo.
4. Don't use hair conditioner. CDC says conditioner will cause radioactive material to stick to your hair.
5. Don't scald, scrub or scratch your skin. Keep cuts and scrapes covered while washing.
6. Put on clean clothes. Clothes that were stored in a closet or drawer away from the dust are safe to wear.

No shower? Wash your hands, face and any skin that was uncovered at a sink or faucet, with soap and plenty of water. No sink either? Use a moist wipe, a clean wet cloth or a damp paper towel on your uncovered skin, paying extra attention to your hands and face. Gently blow your nose, and wipe your eyelids, eyelashes and ears. Bag the used wipes and put them away from people and pets.

No clean clothes? CDC says to take off your outer layer, shake or brush it off, put it back on, then wash your hands, face and exposed skin again.

Caution: Ready.gov says hand sanitizer does not protect against radioactive material, and you should not use household cleaning wipes on your skin. Use soap and water, or a plain moist wipe or wet cloth.

Helping others and pets

If you're helping a child, an older adult or someone with a disability get cleaned off, CDC suggests wearing waterproof gloves and a dust mask if you have them, keeping your own cuts and scrapes covered, and washing your own hands, face and exposed skin again afterward.

For pets, Ready.gov says to gently brush your pet's coat to remove radioactive particles, then wash the pet with soap and water if you can.

Potassium iodide (KI): what it does and doesn't do

You may have heard of "iodine pills" for radiation. The real name is potassium iodide, or KI. There's a lot of confusion about it, so here are the facts from CDC.

- KI is a type of iodine that is not radioactive. It can help block radioactive iodine from being taken up by the thyroid, a gland in your neck.
- KI protects only your thyroid. It does not protect any other part of your body, and it does not protect against other radioactive materials.
- KI is not a treatment. It cannot undo damage already done to the thyroid.
- Do not take KI unless public health or emergency officials, or a health care provider, tell you to.
- To work best, it must be taken within 24 hours before or 4 hours after exposure.
- One dose protects for 24 hours. Officials will say if another dose is needed.
- CDC says KI is recommended only for people under 40 and for women who are pregnant or breastfeeding. Adults over 40 should take it only if officials recommend it.
- KI can cause allergic reactions. People who know they're sensitive to iodine should not take it, or should talk to a health care provider first.
- Use only products approved by the U.S. Food and Drug Administration (FDA). CDC warns that dietary supplements containing iodine may not protect the thyroid and can cause harm.

Caution: Never use table salt or foods that contain iodine as a substitute for KI. CDC says they don't help prevent internal contamination and eating large amounts could be harmful.

So who needs KI? Mainly people near a nuclear power plant during a serious accident, because those accidents can release radioactive iodine. The NRC lists KI as one of the protective actions for the 10-mile zone, "where appropriate." If you live in that zone, ask your county or state health department whether they provide KI ahead of time. If you live far from any plant, you don't need to buy it.

After: staying safe

When officials say it's safe to come out, things won't be back to normal right away. Here's what to keep in mind.

Food and water

- Ready.gov says it's safe to eat and drink food that was inside a building.
- Wipe sealed containers that were outside (cans, bottles, sealed packages) with a damp cloth before you open them.
- Don't eat food from your garden, or food or drinks that were outdoors and uncovered, until officials say it's safe.
- If you live within the 50-mile ingestion zone of a plant, watch for official notices about local milk, produce and water.

Health and stress

If you or a family member is hurt or very ill, call 911. Follow official instructions about where and when to get checked for contamination.

Feeling shaken after something like this is normal. Ready.gov suggests talking with someone you trust if you feel upset. Chapter 8 covers mental health help after disasters, including crisis lines.

Coming home after an evacuation

If you were told to leave, don't go back until local authorities say it's safe. When you do return, follow their instructions about food, water and cleanup.

Special notes for your household

- **Kids.** Practice "Get Inside, Stay Inside, Stay Tuned" like a fire drill. Make sure they know a school will keep them inside and that you'll come when it's safe.
- **Older adults and people with disabilities.** Plan where they'd shelter, who would check on them by phone, and how they'd get medicines and power for medical devices during a day or more indoors. If they live in a care facility, ask for the facility's shelter plan.
- **Pets.** Bring them in quickly if you can. Keep a few days of pet food and water in your kit, and plan for cleaning them off.
- **Renters and apartment dwellers.** You may have a good shelter right in your building. Interior hallways, lower floors, stairwells and basements of brick or concrete buildings are good choices. Know where they are.
- **Mobile and manufactured homes.** These give little shielding. Know the nearest sturdy building (a school, store or office with concrete or brick walls) that you could reach in a few minutes.

Quick checklist

- ☐ Learn the three steps by heart: Get Inside, Stay Inside, Stay Tuned.
- ☐ Find out if you live within about 10 or 50 miles of a nuclear power plant, and ask your county how they'd warn you.
- ☐ Pick the best shelter spot at home, at work and at school (basement or center of a brick or concrete building).
- ☐ Put a change of clothes and some heavy trash bags in your kit.
- ☐ Keep a battery-powered or hand-crank radio with spare batteries.
- ☐ Learn your kids' school and daycare shelter plans.
- ☐ Remember: take off outer clothes, shower with soap and shampoo, and skip the conditioner.
- ☐ Don't take potassium iodide unless officials tell you to.
- ☐ Plan to stay inside for the first 24 hours, and until officials say it's safe.

Chapter 22: Civil Unrest and Active Threats

This chapter is about the emergencies that come from people instead of weather: a protest or gathering that turns violent, a curfew in your town, an attack in a crowded place, a suspicious package left in a lobby, or a bomb threat phoned in to a school or office. Thankfully, most of us will never face most of these. But they're the kind of event where the first few minutes matter, and where having thought about it once, calmly, ahead of time, can help you act instead of freeze.

I'll keep this practical and stick to what official agencies teach the public. There's nothing here about weapons, and nothing about who's to blame for anything. The goal is simple: get yourself and your family away from danger, help others when you safely can, and let trained responders do their jobs.

Civil unrest: when trouble breaks out in your area

What it is

Civil unrest is a broad term for crowds getting out of control: a demonstration that turns into fighting, looting or property damage, or a large disturbance after a big event. The concern here is a gathering that turns violent, and the spillover onto people who just live, work or drive nearby.

Your local police and emergency management office will tell people which areas to avoid and whether there's a curfew. Your job is mostly to stay out of the way and stay informed. County emergency managers keep the advice short. Brevard County, Florida's emergency management office, for example, says to stay inside, close and lock all windows and doors, listen to public safety officials for information, and avoid the affected areas.

The words you'll hear

- **Curfew.** An order from local officials that people stay off the streets during certain hours. The hours, the area covered and any exceptions vary from place to place, so read or listen to the actual order for your area.
- **Shelter in place.** Officials want you to stay inside where you are.
- **Avoid the area.** Officials want people to stay away from certain streets or neighborhoods. Take this seriously, even if your usual route goes right through there.

Before: get ready

Much of your preparation is the same as for any short emergency. A few days of food and water (Chapters 3 and 4), a charged phone and a backup power bank (Chapter 6), and your medications on hand mean you won't need to go out while things are tense. Here are a few extra steps:

- Sign up for your city or county alerts (Chapter 6). This is how you'll hear about curfews, road closures and areas to avoid.
- Know more than one route between home, work and school, so you can steer around trouble.
- Keep at least some cash at home in case stores or card systems are closed for a day or two (Chapter 23 covers this).
- Agree as a family that if something big is happening downtown, nobody goes to "see what's going on."

During: what to do, in order

1. Stay away. If you hear about unrest, don't go there. Curiosity draws a lot of people into danger.
2. If you're at home, stay inside. Lock doors, close blinds and stay away from windows if there's activity on your street.
3. Follow official instructions, including curfews and road closures.
4. Keep your phone charged and check local news and official alerts for updates.
5. If you're out and run into a crowd that's turning rough, stay calm and walk away from it. Move toward side streets, open businesses or your car, and keep going.
6. Don't stop to film, argue or watch. Keep moving away.
7. If you're driving and get blocked in, stay calm. Lock your doors and look for a safe way to turn around or take another route. If you're in danger, call 911.
8. Stay away from fires, broken glass and damaged buildings.

If unrest comes to your street

You might ask, "What if the trouble is right outside my door?" Then staying in is almost always the safer choice. A locked home is a much better place to be than a street full of strangers.

- Stay inside and away from windows. A back bedroom or an interior room is a good place to wait.
- Don't go out to confront anyone, guard a car, or protect property. Things can be replaced. People can't.
- If someone is breaking in, or there's a fire, call 911 right away. If there's a fire, get out as your fire escape plan says (Chapter 9).
- Keep your phone charged, and keep your shoes, keys and go-bag (Chapter 5) by the door in case you're told to leave.

If officials tell your area to leave, go, using the route they give.

After

When things calm down, wait until officials say streets are open before you go back out. Watch for broken glass, debris and damaged buildings. If your home or car was damaged, take photos before you clean up and call your insurance company (Chapter 26 covers documenting damage). Talk with your kids about what happened in simple, calm words. Kids pick up on our stress, and Chapter 8 has ideas for helping them cope.

Attacks in crowded and public places

This is the part of the chapter nobody wants to read. I'll keep it short and stick to what the federal government teaches the public, mainly the Ready.gov page "Attacks in Crowded and Public Spaces." The idea is called **Run, Hide, Fight**. You don't need to memorize anything else.

Before: stay alert and have an exit plan

- **Stay alert.** Ready.gov says to always be aware of your surroundings and any possible dangers. Put the phone down now and then, especially in crowds.
- **Know your exits.** Ready.gov says to have an exit plan and to find exits and places to hide at work, school and special events. The active shooter pocket card from the Cybersecurity and Infrastructure Security

Agency (CISA) puts it simply: take note of the two nearest exits in any place you visit. When you walk into a theater, store or stadium, take two seconds to notice them, including the one you came in through.

- **Notice warning signs.** Ready.gov lists warning signs such as unusual or violent communications, substance abuse, and someone expressing anger or intent to harm. If you see something like that, report it (more below).
- **Learn lifesaving skills.** Ready.gov points to first aid training and the "You Are the Help Until Help Arrives" program. Chapter 8 covers first aid classes and Stop the Bleed.

During an attack: Run, Hide, Fight

If an attack happens near you, here is the official order of business.

Run

Ready.gov says getting away from the attacker is the top priority.

1. Get out if there's a safe way out.
2. Leave your belongings behind.
3. Help others if you can do it safely, as CISA's pocket card puts it.
4. Once you're safe, call 911. Tell them where the attacker is, what they look like, and what weapons you saw.

Hide

If you can't get out, hide. Here's what Ready.gov and CISA's pocket card say:

1. Get to a room or spot out of the attacker's view.
2. If you can, put a solid barrier between you and the threat.
3. Lock and block doors, close blinds and turn off lights.
4. Keep silent. CISA's pocket card says to silence your phone and other devices.
5. If you're in a secure spot, CISA says to stay there until law enforcement enters.
6. CISA says to call or text 911 if you can. Chapter 6 explains text-to-911 and where it works.

Fight

Ready.gov says to fight only as a last resort. In plain words, that means your life is in danger and you can't run or hide. If it comes to that, Ready.gov says to be aggressive and commit to your actions, and to get others to help. I'm not going to go further than that here. If your workplace, school or place of worship offers active threat training, take it.

> **Caution:** Run and Hide come first. Fighting is only for when there is no other choice and your life is in immediate danger.

Helping the wounded

Ready.gov says to take care of yourself first and then, if you're able, help the wounded get to safety and give immediate care. The most useful skill here is stopping bleeding. A Stop the Bleed class teaches it, and Chapter 8 covers the basics. Call 911 as soon as it's safe.

When police arrive

This part surprises people. Arriving officers may not know right away who the attacker is, so how you act matters. Here's what Ready.gov and CISA's active shooter pocket card say to do:

1. Remain calm and follow instructions.
2. Put down anything in your hands, such as bags or jackets.
3. Keep your hands visible and empty at all times.
4. Avoid quick movements toward officers, such as grabbing on to them for safety.
5. Avoid pointing, screaming or yelling.
6. Go to the area officers send you to for information and help, and leave in the direction they tell you.
7. Let family and friends know you're safe when you can.

After an attack

An attack is a shock for everyone involved, including people who were nearby, people who saw it on the news, and children. Ready.gov says to be mindful of your mental health and to seek help for yourself and your family to cope with trauma. Chapter 8 lists free crisis lines, including the Disaster Distress Helpline.

"If You See Something, Say Something"

"If You See Something, Say Something" is a national public awareness campaign from the U.S. Department of Homeland Security (DHS). The idea is simple: if you notice something that seems suspicious, tell the authorities.

DHS describes it as a national campaign that raises public awareness of the signs of terrorism and terrorism-related crime. Its advice on where to report is plain: report suspicious activity to your local law enforcement. If someone is in danger right now, call 911.

What counts as suspicious? Focus on what someone is doing, not on who they are or how they look. Ready.gov mentions things like suspicious packages, strange behavior and unusual communications, and warning signs such as violent talk or someone saying they intend to hurt people.

When you report, it helps to give the basics: what you saw, where and when you saw it, and a description of any people or vehicles involved. Then let the professionals decide what it means. You're not accusing anyone; you're passing along what you noticed.

> **Tip:** Save your local police department's non-emergency number in your phone now. It's the right number for something odd that isn't an emergency.

Suspicious packages and unattended items

Most bags left behind are just that: someone forgot a backpack. CISA, which is part of DHS, teaches a simple way to tell an ordinary lost item from a suspicious one. It's called **HOT**:

Letter	Stands for	Examples from CISA
H	Hidden	Placed out of sight, appears purposely hidden
O	Obviously suspicious	Unexplained wires or electronics, parts that look like a bomb
T	Not typical	Out of place for the location, possibly connected to a threat

If an item is not HOT, CISA says to treat it as an unattended item: use caution, try to find the owner, and report it to someone in charge, such as building staff or security.

If an item is HOT, CISA's steps are:

1. Don't touch it. Move away right away and tell others to move away too.
2. Keep people away from the area.
3. Protect yourself by putting something solid between you and the item.
4. Report it to local law enforcement, or call 911 if it's an emergency. Tell them what you saw and where.

Caution: Never touch, open, move or shake a suspicious item, and don't try to carry it outside. Get away from it and call 911.

Bomb threats

A bomb threat is a message, often by phone, saying a bomb has been placed somewhere. Schools, offices and stores sometimes get these, and every one has to be taken seriously.

If a bomb threat comes in where you are, the person in charge (a principal, manager or building security) will decide whether to search, evacuate or shelter, usually with police. Your part is to follow their instructions calmly, take your personal things only if you're told to, and stay away from anything that looks out of place.

If you're the one who takes the call, CISA publishes a free Bomb Threat Checklist that many workplaces keep by the phone. Here's what it says, in plain words:

1. Stay calm and don't hang up. Keep the caller on the line as long as you can.
2. If you can, signal a coworker to listen in and to tell the person in charge.
3. If your phone shows the caller's number, copy it down.
4. Write down the exact words of the threat. Record the call if you can.
5. Ask questions if you can, such as where the bomb is, when it will go off, what it looks like, and why.

If the threat comes in writing, handle the paper as little as possible, note when and where it was found, and don't change it in any way. If it comes by email or social media, don't log out or close the message. Leave it open, and take a screenshot or copy the message and subject line.

Caution: CISA says not to use two-way radios or cell phones close to a suspicious item, and never to touch or move one. If a suspicious item is found, call 911.

If your workplace has its own bomb threat procedure, follow it.

Plans at work, school and places you visit

Most workplaces, schools, hospitals and large venues have plans for these events, and some run drills. It's worth knowing the basics of the plans that affect you most.

- **At work.** Ask your employer or building manager how they'd alert people to a threat, where the exits and safe rooms are, and what to do if there's a lockdown. If they offer active threat or first aid training, take it.
- **At school.** Ask how the school alerts parents, what its lockdown procedure is, and where families would be sent to pick up children afterward. Make sure your contact information on file is current.
- **At big events.** Notice the exits when you arrive. Agree with your group on a meeting spot outside in case you get separated. Keep your phone charged.
- **At home.** Talk through what each person would do if something happened while you were apart, and who they'd call. Chapter 2 covers an out-of-area contact, which is handy when local phone lines are busy.

Talking with kids about scary news

Kids hear about attacks and unrest, from the news, from friends and from school drills. You don't need to give them every detail. Keep it short, calm and honest: bad things are rare, many grown-ups work hard to keep them safe, and the family has a plan. Let them ask questions, and answer only what they ask. Limit how much news they watch, especially young children. If a child seems very worried for a long time, has trouble sleeping, or stops wanting to go to school, talk with their doctor or school counselor. Chapter 8 has more on helping kids cope after disasters.

Special notes for your household

- **Kids.** Schools practice lockdowns. Ask your child's school how it handles lockdowns and reunification (where parents pick up children after an emergency), and I'd avoid rushing to the school during an incident unless officials ask parents to come. Extra cars can block roads that responders need.
- **Older adults and people with disabilities.** Think ahead about how you'd get out of the places you go most, or where you'd hide if you couldn't. If you use a wheelchair or walker, notice accessible exits when you arrive.
- **Renters and apartment dwellers.** During unrest, a locked lobby door and an interior hallway can be good places to wait. Know your building's exits.
- **Commuters.** Keep a power bank, a little cash and comfortable shoes at work in case transit shuts down and you need to walk home or wait it out (Chapter 5 covers a work kit).
- **Firearms at home.** If you keep any firearms, store them locked and secured.

Quick checklist

- ☐ Sign up for your city or county alerts.
- ☐ Agree as a family: when trouble starts somewhere, we stay away and stay home.

- ☐ Learn Run, Hide, Fight, and talk about it calmly with older kids.
- ☐ Make a habit of noticing exits whenever you enter a store, theater or stadium.
- ☐ Take a first aid or Stop the Bleed class (Chapter 8).
- ☐ Know the HOT signs of a suspicious item, and never touch one.
- ☐ Save your local police non-emergency number in your phone.
- ☐ Ask your kids' schools how they handle lockdowns and reunification.

Chapter 23: Cyberattacks and Long Disruptions

Some emergencies don't come with wind or water. A computer attack shuts down a hospital's records system. A bank's app goes dark for a day. A pipeline problem leaves gas stations with long lines. A big storm on the sun stirs up trouble for satellites and power lines. None of these will knock down your house, but they can make normal life hard for days, sometimes longer.

This chapter covers what those disruptions look like, what you can control (more than you'd think), and how to keep your household running when the systems we count on are slow or down. The theme is the same as the rest of this book: a little preparation ahead of time turns a crisis into an inconvenience.

I ran a computer repair business from 2003 to 2013, and I know how much daily life depends on connected networks. When payment systems or fuel pumps go offline, a digital problem becomes a physical emergency fast. Keep some cash on hand, print key phone numbers and keep offline backups at home.

Cyberattacks in plain words

A **cyberattack** is an attempt by criminals or others to break into, damage or shut down computers, networks or the devices connected to them. Attacks can target one person (like a scam email that steals your bank password) or big organizations like hospitals, utilities, banks, stores and local governments.

What a cyberattack might mean for you

When a large organization is hit, you might notice things like:

- A hospital or clinic switching to paper records or delaying appointments.
- A store that can't take cards, or a bank or payment app that's down.
- A city or county office that can't process permits, payments or records for a while.
- Gas stations, pharmacies or other businesses with trouble ordering or paying.
- Less often, a utility such as water or power having trouble.

You can't stop an attack on a big company. What you can do is protect your own accounts and devices, and set up your household so a few days of broken systems don't leave you stuck.

What you can control: your own accounts and devices

The Cybersecurity and Infrastructure Security Agency (CISA), part of the U.S. Department of Homeland Security, runs a public campaign called Secure Our World. It boils personal online safety down to four habits. None of them takes more than an evening to set up.

Habit	What CISA says	What it means for you
Use strong passwords	Make passwords at least 16 characters long, random and unique for each account. Use a password manager.	A long, different password for every account, so one break-in doesn't open them all.
Turn on multifactor authentication (MFA)	Use MFA on any site that offers it. It makes you much less likely to get hacked.	A second step, like a code on your phone, on top of your password.

Habit	What CISA says	What it means for you
Recognize and report phishing	Don't click or engage. Watch for alarming language or offers that are too good to be true. Report and delete.	Slow down when a message pushes you to act fast.
Update software	Install updates as soon as possible. Turn on automatic updates.	Let your phone and computer fix security holes for you.

A few plain-language notes on each:

Passwords. A **password manager** is a program that creates and stores strong passwords for you, so you only have to remember one good one. If that feels like too much, start with your email account. Your email is the master key: if a criminal gets into it, they can reset the passwords on almost everything else.

Multifactor authentication. MFA means you need two things to log in: your password and something else, usually a code texted to your phone or shown in an app. Turn it on first for email, banking and your phone carrier account. CISA says to use it on any site that offers it.

Phishing. Phishing is a fake email, text or call made to look like it's from your bank, a delivery company, a government agency or even a family member. The goal is to get you to click a link, open an attachment, or hand over a password or payment. The Federal Trade Commission (FTC) warns that scammers quickly take advantage of weather emergencies and disasters, when people are stressed and expecting messages. If a message makes you feel rushed or scared, stop. Contact the company or person a different way, using a number you already know.

Updates. Those update pop-ups are annoying, but many of them fix security holes. Turn on automatic updates for your phone, computer, tablet and router.

Back up what matters

CISA's four habits don't cover backups, but the FTC adds one more: back up your data. Keep copies of the things you can't replace. Family photos, tax records, scanned documents and contacts can be lost to a broken phone, a fire, or **ransomware** (harmful software that locks up files until someone pays the criminals). The FTC says to back up your computer to an external hard drive or the cloud, and to back up your phone too. I'd keep one copy on an external drive at home and, if you're comfortable with it, another in a cloud account protected by MFA.

Keep cash and paper copies

The single most useful thing you can do for any kind of system outage is keep a little cash and paper backups. Cards, apps and online accounts all depend on power, phone networks and computer systems working. When any of those fail, cash and paper still work.

How much cash? There's no official number that fits every family. I'd aim for enough to cover a few days of basics for your household: groceries, a tank of gas, a prescription co-pay, maybe a night in a motel. Keep it in small bills, because stores with no working registers may not be able to make change. Keep it somewhere safe and private at home, and don't count it as savings you can dip into. If you use it, put it back.

Paper copies worth having

Chapter 2 explains how to build a set of important documents. For long disruptions, I'd make sure the paper version includes:

- A list of important phone numbers: family, doctors, pharmacy, insurance, bank, utilities, landlord, employer, school. Your phone's contact list won't help if the phone is dead.
- A list of every prescription for each person, with dose and the prescribing doctor.
- Account numbers and customer service phone numbers for your bank, credit cards and insurance policies.
- A printed map of your area with a few routes marked (Chapter 7).

Keep these with your important papers in a waterproof bag, and update them once a year.

> **Caution:** Don't write down passwords on the same sheet as account numbers, and keep any password list locked away. A paper list in the wrong hands is as bad as a hacked account.

When banks, cards or ATMs are down

An app that won't load is scary, but an outage doesn't make your money disappear. The Consumer Financial Protection Bureau (CFPB), the federal agency that watches over banks and lenders, says your money is still protected during an outage. Deposits at a bank insured by the Federal Deposit Insurance Corporation (FDIC) or a credit union insured by the National Credit Union Administration (NCUA) are insured up to the federal limit, even if the bank or credit union fails. Here's how I'd handle an outage, based mostly on the CFPB's advice:

1. Don't panic, and don't rush to pull out all your money.
2. Use your cash for what you truly need today.
3. Get updates straight from your bank. The CFPB says to call the number on the back of your card or on your statement, not a number from a text, email or social media message.
4. Use another way to pay if one is working. The CFPB notes that if your card is affected, you may still be able to write a check, use the mobile app, or take out cash in person. If online banking is down, try the phone number on your card.
5. Watch for scams. The CFPB warns that thieves sometimes pose as your bank by email, phone, text or social media. If someone contacts you saying they're from your bank and need you to "verify" your account, hang up and call the number on your card yourself.
6. Check your automatic payments. If they aren't going through, pay another way, on time if you can.
7. If the outage caused late fees, overdraft fees or other charges, ask your bank to credit your account. The CFPB says you can ask.

If you can't get a problem fixed, you can file a complaint with the CFPB at consumerfinance.gov/complaint. Chapter 24 covers money trouble more fully, including talking with lenders and avoiding predatory loans.

Fuel shortages

Gas stations can run short after a big storm or when something goes wrong with fuel deliveries. When everyone rushes to fill up at once, the lines get longer for all of us. My advice:

- **Don't run low.** The American Red Cross suggests keeping your car's gas tank at least half full (Chapter 7 covers fuel for evacuation). Gas pumps also need electricity, so a power outage can close stations too.
- **Don't hoard.** Filling extra containers you don't need takes fuel from people who need it to get to work or the hospital.

- **Store fuel only the safe way.** Never store gasoline inside your home. If you keep fuel for a generator, Chapter 10 covers the U.S. Consumer Product Safety Commission (CPSC) and Red Cross basics: approved, labeled containers, kept outside living areas.
- **Cut back.** Combine errands, carpool, work from home if you can, and let the lines shrink.

Caution: Only put gasoline in a container made for fuel. Never use milk jugs, bottles or other household containers.

Scams after outages and attacks

Big outages and cyberattacks bring out scammers. They know people are worried and expecting messages from their bank, utility or pharmacy. A few simple rules go a long way:

- Never give a password, PIN or a code sent to your phone to anyone who contacts you. That's my firm rule, and it has no exceptions.
- Don't click links in texts or emails about an outage, a refund or a "problem with your account." The FTC says to contact the company using a phone number or website you know is real, not the contact details in the message.
- Listen to how they want to be paid. The FTC says anyone who tells you that you can only pay by bank transfer, wire transfer, cryptocurrency, payment app or gift card is probably a scammer.
- If you think you gave out information, call your bank right away using the number on your card, and change the password on the affected account.

These steps apply to phone calls, texts, emails and social media messages alike. If you spot a scam, the FTC asks you to report it at ReportFraud.ftc.gov.

Store shortages: buy a little at a time

When people hear about a possible shortage, many rush out and buy everything at once. In my view, a lot of the empty shelves you see on the news come from that rush, not only from the shortage itself.

Here's my advice: don't hoard. Build your supplies steadily, a few extra items each shopping trip, the way Chapters 3 and 4 describe. If you already have a couple of weeks of the basics at home, a shortage won't push you into a crowded store at the worst time, and the shelves will have more for neighbors who weren't ready.

- Buy what you'll actually use, and use the oldest first.
- Keep a small extra supply of medicines, with your doctor's and pharmacist's advice (Chapter 8).
- If something you need is short, ask your pharmacist or store about substitutes rather than driving all over town.
- Watch out for price gouging (sharp price hikes on things people need in an emergency) and scams during shortages. Rules on price gouging vary by state, so if you see it, contact your state attorney general or consumer protection office. Report scams to the FTC at ReportFraud.ftc.gov.

Long, wide power outages

Chapter 10 covers ordinary power outages. This section is about the rarer case when power is out across a large region for days.

Very large outages that last for days are much less common than local ones. When they happen, it's usually because a big event, such as a major storm, damaged a lot of equipment at once, and crews need time to rebuild.

What's different about a long, wide outage is that the things you'd normally lean on are also affected: stores, gas stations, cell towers, traffic lights, water systems and ATMs. So the plan shifts from "wait a few hours" to "be comfortable at home for a while." That means:

- Water first (Chapter 3), then food you can eat without cooking (Chapter 4).
- Safe light and safe heat or cooling (Chapters 9, 10, 17 and 18).
- A way to get news without the internet: a battery-powered or hand-crank radio (Chapter 6).
- A plan for anyone who needs power for medical equipment (Chapter 10), including where they'd go if the outage drags on.
- Checking on neighbors, especially older adults and people who live alone.

Space weather and solar storms

Space weather means conditions on the sun and in space that can affect technology on Earth. The sun sometimes throws off bursts of energy and charged particles. When a strong burst hits Earth, it can cause a **geomagnetic storm**, a disturbance in Earth's magnetic field. These storms are also what make the northern lights show up farther south than usual.

Most space weather events are mild and pass without anyone noticing. The National Oceanic and Atmospheric Administration (NOAA) runs the Space Weather Prediction Center, which forecasts these storms and rates geomagnetic storms on a scale from G1 (minor) to G5 (extreme), a bit like the categories for hurricanes. Here's what NOAA's scale says about the two ends:

Level	About how often	What NOAA says it can do
G1 Minor	About 1,700 times per 11-year solar cycle	Weak power grid fluctuations; minor impact on satellites; northern lights commonly visible in places like northern Michigan and Maine.
G5 Extreme	About 4 times per 11-year solar cycle	Widespread voltage control and protective system problems on power grids, and some grid systems may collapse or black out; problems for satellites; high-frequency radio may be impossible in many areas for one to two days; satellite navigation may be degraded for days; northern lights seen as far south as Florida and southern Texas.

So the big ones are rare, and even then, the main concerns are the power grid, satellites, radio and satellite navigation such as the Global Positioning System (GPS). NOAA posts its space weather forecasts at spaceweather.gov.

What should a household do? Nothing special. The preparations in this book for any power outage cover you. A paper map in the car is a nice backup if satellite navigation ever acts up, and a battery-powered radio covers you if other news sources are down.

When the water system fails

Public water systems can fail because of a power outage at a pumping station, a main break, flooding, contamination, or a computer problem. When that happens, your water company or health department will usually issue one of these:

- A **boil water notice**, which means the water may have germs in it. Boil it before drinking or cooking.
- A **do not drink** or **do not use** notice, which means boiling won't make it safe. Use stored or bottled water instead.

Follow the exact instructions in the notice. Chapter 3 explains these notices in detail, along with how much water to store and how to make water safe.

If you need to boil water, the Centers for Disease Control and Prevention (CDC) says to bring it to a rolling boil for 1 minute, or 3 minutes if you're above 6,500 feet. If boiling isn't possible, you can disinfect clear water with unscented household chlorine bleach, using 8 drops per gallon of 6% bleach or 6 drops of 8.25% bleach, stirring and waiting at least 30 minutes. Chapter 3 has the full steps, including what to do with cloudy water.

> **Caution:** If the notice says "do not drink" or "do not use," don't boil the water and use it anyway. Follow the notice and use stored or bottled water until officials say the tap water is safe.

Your long-disruption plan

A long disruption plan is mostly the plan you've already built in this book, stretched to cover more time. Here's how I'd think about it.

Time. Ready.gov's basic kit says to keep water for several days, at one gallon per person per day for drinking and sanitation, and at least a several-day supply of non-perishable food. For long disruptions, I'd build past that slowly, a few items each shopping trip, toward a couple of weeks. CDC also suggests a 2-week supply of water if possible (Chapter 3 has the numbers). You don't need to get there this month.

Money. Some cash at home, a paper list of accounts and contacts, and bills set up so a short outage doesn't make you miss a payment.

Information. A battery-powered or hand-crank radio, a way to charge phones, and your local alert sign-ups (Chapter 6).

Health. A small extra supply of prescription medicines and over-the-counter basics, plus paper copies of prescriptions (Chapter 8).

Community. This is the part people skip, and it matters most in a long disruption. Get to know a few neighbors. Trade phone numbers. Know who's older, who lives alone, and who has a medical need. During a long outage, a street where people check on each other is far better off than one where everyone waits alone. Ready.gov suggests joining a Community Emergency Response Team (CERT) program, which trains people in basic disaster response skills. A neighborhood group is another good start.

Special notes for your household

- **Older adults.** Scammers often go after older adults, so talk through the warning signs together: pressure to act fast, requests for gift cards or wire transfers, and anyone asking for passwords or codes.
- **People who rely on medical devices or regular treatments.** Ask your provider what happens if their systems go down, and keep paper copies of your treatment schedule, prescriptions and contacts.
- **Kids and teens.** Teach them never to share passwords or codes sent to a phone, and to tell you about any message that seems strange.
- **Renters.** Know how your landlord wants to hear about building problems during an outage, and keep a paper copy of your lease and their phone number.

Quick checklist

- ☐ Turn on multifactor authentication for your email, bank and phone accounts.
- ☐ Use strong, unique passwords, ideally with a password manager.
- ☐ Turn on automatic updates for your phone and computer.
- ☐ Back up your photos and documents to an external drive or the cloud.
- ☐ Keep some cash at home in small bills.
- ☐ Print a paper list of important phone numbers, prescriptions and account contacts.
- ☐ Build your supplies slowly toward two weeks, a few items each trip.
- ☐ Keep your car's gas tank from running low.
- ☐ Talk with your neighbors about how you could help each other in a long outage.

Chapter 24: Money Trouble and Job Loss

Not every emergency comes with wind or water. A layoff, a cut in hours, a big car repair, or a disaster that closes your workplace can shake a household just as hard as a storm. The bills keep coming even when the paychecks stop.

This chapter covers the money side of being ready: building a small emergency fund, what to do in the first days after a job loss, where to find help with food, energy bills and housing costs, and how to stay away from the loans and scams that prey on people in a tight spot. It is not investment advice, and it is not legal advice. For questions about your own situation, talk to the agency that runs the program, a nonprofit counselor, or a lawyer.

Why money belongs in an emergency plan

You might ask, "What does money have to do with survival?" It's simple: most of the hard choices people face after an emergency are money choices. Can I pay rent this month? Can I fill a prescription? Can I afford a motel if we have to leave home? A household with a little cash set aside and a plan for who to call has more good options and fewer bad ones.

Money trouble also tends to stack up: a disaster can close your job site and damage your car in the same week. The steps here work for a quiet layoff and for a declared disaster alike.

Before: get ready when times are good

Start an emergency fund, even a small one

The Consumer Financial Protection Bureau (CFPB), a federal agency that watches over banks and lenders, describes an emergency fund as a cash reserve set aside for unplanned expenses or financial emergencies. Its main point is encouraging: even a small amount gives you some security.

How much should you aim for? The CFPB does not set one number for everyone. It suggests you think about the surprise costs you've had in the past, like a car repair or a medical bill, and how much they cost. That gives you a first goal you can actually reach. Once you hit it, set the next one.

Here's how to get it going without feeling the pinch too much:

- Set up a recurring transfer from checking to savings at your bank or credit union, timed for right after payday. Keep an eye on your balance so the transfer doesn't cause an overdraft fee.
- If your employer allows it, split your paycheck so part of it goes straight into savings before you ever see it.
- Put all or part of a tax refund or other one-time money into the fund. That can build it fast.
- Start small. A few dollars a week adds up, and the habit matters more than the amount at first.

> **Tip:** Give the fund its own account, separate from the one your debit card spends from. Money you can't see is money you won't spend by accident.

Where to keep it

The CFPB calls a bank or credit union account generally one of the safest places to keep your money. A prepaid card is another option, since you can only spend what's loaded on it. Cash at home works too, but the CFPB points out that cash can be stolen, lost or destroyed.

I'd keep most of the fund in a federally insured account and a small amount of cash in small bills at home. During a power outage or a computer problem, card readers and ATMs may not work for a while. Chapter 5 covers cash in your emergency kit, and Chapter 23 covers what to do when banks, cards or ATMs are down.

Decide what counts as an emergency

Write down your own rules before you need them. A furnace that quits in January is an emergency. A sale on a television is not. The CFPB's advice is plain: when a real emergency comes, don't be afraid to use the fund. That's what it's for. Then start rebuilding it.

Make a simple monthly budget now

A budget is just a list of what comes in and what goes out. Make one while things are calm, because you'll want it fast if your income drops. Sort your spending into three groups:

Group	Examples	Why it matters in a crisis
Must pay first	Rent or mortgage, utilities, food, medicine, insurance, transportation to work	Keeps a roof over your head, the lights on and you able to work
Must pay, but may be able to adjust	Car loan, credit card minimums, student loans, phone	Lenders may offer a lower payment or a delay if you call early
Can pause or cut	Streaming services, eating out, memberships, extras	Quick savings that buy you time

Do the math once now: if your paycheck stopped tomorrow, how many weeks could you cover the first group? That number is your starting point.

Keep a money page with your important papers

Chapter 2 covers storing important documents. Add one page about money to that folder:

- ☐ Bank and credit union names, phone numbers and the last four digits of each account
- ☐ Lenders and loan numbers (mortgage, car, student loans, credit cards)
- ☐ Insurance companies, policy numbers and claim phone numbers
- ☐ Your employer's human resources contact and how pay stubs are delivered
- ☐ Landlord or property manager contact information
- ☐ Utility account numbers (electric, gas, water, phone, internet)

Never write passwords or full account numbers on this page. If it gets lost, you don't want it to open your accounts to a stranger.

Keep your insurance in force

When money gets tight, insurance is one of the first bills people want to skip. Try hard not to. A lapse in home, renters, auto or health coverage can turn a bad month into a disaster if something happens during the gap. If a

premium is too high, call your agent or company and ask about a higher deductible or a payment plan before you let a policy lapse. Chapter 2 explains what home and renters policies usually do and don't cover.

During: the first days after a job loss

If you lose your job or your hours are cut, the first week matters. Here's the order I'd take things in.

Step 1: File for unemployment right away

Unemployment insurance (UI) is a joint federal and state program, but each state runs its own. According to the U.S. Department of Labor (DOL), it's for eligible workers who become unemployed through no fault of their own, and each state sets its own rules for who qualifies. In general, you must have lost your job because there was no work for you, and you must have earned enough wages or worked enough during a set period before the job loss. Your state may have other rules too.

1. Contact the unemployment insurance program in the state where you worked, as soon as possible after you become unemployed.
2. File your claim the way your state allows. Depending on the state, that may be online, by phone or in person.
3. If you worked in more than one state, or you now live in a different state from where you worked, contact the agency in the state where you live now and ask how to file.
4. Plan for a gap. The DOL says it generally takes two to three weeks after you file to receive your first benefit check.

> **Tip:** Don't wait to file because you hope the job will come back, or because you aren't sure you qualify. Let the state decide. Filing late can cost you weeks of benefits you could have had.

Keep a simple log while your claim is open: the date you filed, your claim or confirmation number, every phone call (date, time, who you spoke with) and any job search activity your state asks you to report. If something goes wrong, that log helps.

Step 2: Protect your health coverage

If you had health insurance through your job, find out right away when it ends and what your choices are. Don't let a gap in coverage sneak up on you, especially if someone in your home takes daily medicine.

One choice may be to keep your job's plan for a while under COBRA (named for the federal law that created it). According to the DOL, you may qualify if you were laid off, quit, retired or had your hours cut, your employer had 20 or more employees, and the employer still has a health plan. (People fired for gross misconduct don't qualify.) COBRA coverage starts the day your job coverage ended and lasts up to 18 months, longer in some cases. You have 60 days from the date of the notice, or from the date your coverage ended, to sign up.

COBRA isn't cheap. The DOL says the plan may charge you the entire group premium plus a 2 percent administrative fee. Before you sign up, compare it with other choices. The DOL says you may also be able to get special enrollment in a Health Insurance Marketplace plan, and points to HealthCare.gov for details. If someone in your family has a health plan through work, you may be able to join it through special enrollment. The DOL says you must ask within 30 days of losing your own coverage.

Step 3: Sort your bills and call early

Go back to your three-group budget. Pay the first group first. Then pick up the phone.

This is the most useful money advice I know: call your lenders, landlord and utilities before you miss a payment, not after. Federal pages for people affected by hard times say the same thing again and again. If you can't pay a credit card bill, your card company may be able to help. If you're having trouble with car payments, contact your lender. The CFPB adds that a smaller repayment amount may make it easier to pay a debt back.

When you call, have your account number, a short honest summary of what changed and a rough idea of what you can pay. Ask plainly: "Do you have a hardship program? Can I pay less for a few months or move a payment to the end of the loan?" Write down the name of the person you spoke with and what they agreed to, and ask them to send it in writing.

If you own your home and can't make the mortgage payment, or you're worried you'll miss one, the CFPB says to call the company you send your payment to (your mortgage servicer) right away. Its number is on your monthly statement. Explain why you can't pay, whether the problem is short-term or lasting, and what your income and expenses are. Depending on your situation, the servicer may be able to offer a repayment plan, a loan modification (a permanent change to the loan's terms) or forbearance (a pause or cut in payments for a set time).

The CFPB also says to contact a housing counseling agency approved by the U.S. Department of Housing and Urban Development (HUD) for free, expert help avoiding foreclosure. You can call the HOPE Hotline at 1-888-995-4673, any time of day, any day of the week. You don't have to pay anyone to help you avoid foreclosure.

Renters should talk to the landlord early, too. Rules about late rent and eviction depend on your state and city, so check your state and local rules, and talk to a lawyer or legal aid office if you get an eviction notice.

Help with food, energy and other bills

There's no shame in using these programs. They exist for exactly this. Apply early, because most take some time to process.

211: one call to find local help

Dial 211 to reach a local information and referral line. 211 connects people with help for housing costs, utility bills, food programs and disaster recovery, and the 211.org website says every call is completely confidential. You can also use the "find your local 211" search at 211.org. If you don't know where to start, start here.

SNAP (food benefits)

The Supplemental Nutrition Assistance Program (SNAP) helps people with low income buy the food they need. State public assistance agencies run it. Once you're found eligible, benefits go onto an Electronic Benefit Transfer (EBT) card with a PIN, and you use it like a debit card at most stores that sell food.

What can you buy with SNAP? Food, and plants and seeds to grow food for your household. You can't use it for alcohol, tobacco, vitamins, medicines, hot foods, food eaten in the store or nonfood items. Some states now limit what SNAP can buy, such as soda and candy. Check your state's rules.

To apply, contact your local SNAP office. You can ask for a paper application in person, by phone or by mail, and some states take applications online or by phone. The U.S. Department of Agriculture (USDA) keeps a state-by-state directory of SNAP offices on its website.

WIC (for mothers, babies and young children)

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) helps with food and nutrition for:

- Women who are pregnant, or postpartum (up to 6 months after a pregnancy ends)
- Breastfeeding women, up to the baby's first birthday
- Infants
- Children up to their fifth birthday

You apply through a WIC agency in your area, and some offer online applications. If you already take part in Medicaid, SNAP or Temporary Assistance for Needy Families (TANF), you may already meet the income rules. Every applicant gets a free, simple health check by WIC staff before enrolling.

LIHEAP (heating and cooling bills)

The Low Income Home Energy Assistance Program (LIHEAP) can help pay heating or cooling bills, and it can also help with emergency services during an energy crisis. Depending on where you live, it may help with electric bills too. Eligibility is based on income, and each state sets its own rules. Start at usa.gov/help-with-energy-bills, which walks you through checking if you qualify and finding your state's LIHEAP office. Some offices take applications online. Others want you to come in.

If you're behind on a utility bill, call the utility before it's shut off. Each state has its own policy on when a utility can and can't disconnect electricity or natural gas for nonpayment. The usa.gov energy page says those policies may take into account the weather, your age, whether you have a disability and your utility company. If you or someone at home depends on powered medical equipment, tell the utility that when you call. Chapter 10 has more on planning for medical devices during outages.

For energy-saving home repairs, the Weatherization Assistance Program may help. Eligibility depends on income or on getting benefits such as TANF or Supplemental Security Income (SSI). Contact your state's weatherization office to see if you qualify.

Need	Where to start	Notes
Don't know where to start	Dial 211 or visit 211.org	Confidential local referrals
Lost job	Your state unemployment insurance program	File as soon as possible; first payment usually takes two to three weeks
Food	Local SNAP office; WIC agency for moms, babies and children under 5	SNAP is loaded on an EBT card
Heating or cooling bill	usa.gov/help-with-energy-bills (LIHEAP)	Each state sets its own rules
Credit card or car loan	Call your lender before you miss a payment	Ask about hardship programs
Mortgage or rent	Your mortgage servicer or landlord, early	Homeowners: HOPE Hotline 1-888-995-4673 for a free HUD-approved housing counselor

When a disaster costs you your job

Disasters can close a workplace for weeks. If the President declares a major disaster for your area, extra help may open up.

Disaster Unemployment Assistance (DUA)

Disaster Unemployment Assistance (DUA) gives money to people whose work was lost or interrupted as a direct result of a major disaster declared by the President. According to the DOL, it's for people who are not eligible for regular unemployment insurance. That's important for people who are self-employed: an unemployed worker or self-employed person who lived, worked or was scheduled to work in the disaster area may qualify. A person who became the head of household because the former head of household died in the disaster may also qualify.

DUA covers weeks of unemployment during the disaster assistance period, which can last up to 26 weeks after the date the disaster was declared.

1. Watch for your state's announcement about DUA after a disaster declaration.
2. Contact your state unemployment insurance agency to apply. Don't wait: the DOL says DUA applications must be filed within 30 days of the state's announcement that DUA is available.
3. If you evacuated or moved, contact the affected state's agency, or the agency in the state where you are now staying, and ask for help filing.

Disaster food help (D-SNAP)

After some disasters, USDA's Disaster Supplemental Nutrition Assistance Program (D-SNAP) gives food benefits to people who don't qualify for regular SNAP but had disaster-related losses, such as loss of income or property. Listen for state announcements to learn whether it's available after a disaster in your area. The USDA also says to contact the disaster relief organization in your area to find out where to get food help, and 211 can point you there too.

Help with bills after a disaster

After a disaster, your local LIHEAP office may help with heating and cooling bills, and each office sets its own rules. Credit card companies and car lenders may also be able to help if a disaster leaves you unable to pay. People with federal student loans who were affected by a federally declared disaster may qualify for help too. For a list of these and other options, see usa.gov/disaster-help-with-bills. Chapter 26 covers the rest of disaster recovery, including Federal Emergency Management Agency (FEMA) assistance and insurance claims.

Stay away from bad loans

When you're short on cash, fast money looks good. Some of it costs far more than it seems.

Payday loans

The CFPB describes a payday loan as a short-term, high-cost loan, generally for $500 or less, that's usually due on your next payday. The due date is typically two to four weeks after you borrow. Many state laws set a maximum fee, and those limits range from $10 to $30 for every $100 borrowed.

Let's do the math the CFPB does. A two-week loan with a fee of $15 per $100 works out to an annual percentage rate (APR) of almost 400 percent. Compare that with credit cards, which the CFPB puts at roughly 12 to 30 percent. And if you can't repay on time, the lender may encourage you to pay just the fee and roll the loan over for a few more weeks. That's how a short loan turns into a long, expensive one.

Before you take a payday loan, try these first:

- Call the company you owe and ask for a smaller payment or more time.
- Ask your bank or credit union about a small loan. The CFPB notes there may be less expensive choices there.
- Ask your employer, a nonprofit or a community group. Some offer advances or emergency credit.
- Use your emergency fund. This is the moment it was built for.

Caution: Read every loan agreement before you sign, including the total amount you'll pay back and the due date. If you don't understand it, don't sign it yet.

Debt relief and "fix it fast" offers

Be careful with any company that calls you out of the blue offering to wipe out your debts, lower your interest rate or save your home, especially if it wants money up front. For homeowners, the CFPB lists these warning signs of a foreclosure scam: you're asked to pay up front for help, the company guarantees you won't lose your home, or you're told to stop paying your mortgage. A safer first step is to call your lenders yourself and, for homeowners, a HUD-approved housing counselor.

The Federal Trade Commission (FTC), the federal consumer protection agency, adds a few more red flags in its advice on getting out of debt:

- A debt settlement company can't collect its fees from you before it settles your debt. The FTC says only scammers try to collect fees before they settle any of your debts.
- Only scammers guarantee to settle all your debts or promise results from a "government" program that will pay off your debt.
- Only scammers tell you to stop talking to the companies you owe without explaining the serious consequences.
- If you go to a credit counselor, look for one that reviews your whole money picture first and doesn't charge you before it does anything. Being a nonprofit doesn't guarantee that a counselor is free, affordable or legitimate.

Watch out for job scams

Scammers know that people who lost a job are eager to find another one. The FTC lists these warning signs:

- **You're asked to pay to get the job.** Real employers, including the federal government, don't charge you to be hired. Don't pay for the promise of a job.
- **You're sent a check to deposit and asked to send part of the money somewhere else.** That's a fake check scam. The check will bounce, and you can end up owing the bank the full amount.
- **An ad promises a job with the federal government or the postal service for a fee.** Real openings are free to find. Look for federal jobs at USAJobs.gov and postal jobs at usps.com/employment.

- **The job is to receive packages at home, repack them and ship them on.** Reshipping is never a real job. The goods are often bought with stolen credit cards.

If you see a job scam or lose money to one, report it to the FTC at ReportFraud.ftc.gov. You can also report it to your state attorney general.

> **Tip:** If a job offer arrives before you ever applied or talked to anyone, slow down. Look up the company yourself and call a number you found on your own, not one in the message.

Rising prices and empty shelves

Prices go up and down, and sometimes stores run short of certain things for a while. I won't guess what will happen next, and you shouldn't trust anyone who claims to know. What you can control is your own household:

- Build your food and water supplies a little at a time, as Chapters 3 and 4 describe. A few extra items each shopping trip is easier on the budget than one big haul, and you won't be buying in a panic.
- Don't hoard. Buying far more than you need during a shortage makes it worse for your neighbors and often wastes money on things that spoil.
- Eat what you store and store what you eat, so nothing goes to waste.

Chapter 23 covers longer disruptions, including fuel and supply shortages.

Special notes

Families with children

Kids notice money stress even when nobody talks about it. Tell them, in simple words, that the grown-ups have a plan. If you have a baby or a child under 5, check whether WIC can help.

Older adults and people with disabilities

If you get Social Security, a pension or disability benefits, set up direct deposit so a closed post office or a lost check doesn't delay your money. When you call a utility about a past-due bill, tell them about any age, disability or medical equipment issues, since many states consider these in shutoff rules.

Renters

Talk to your landlord early, in writing if you can, and keep copies. Ask 211 about rent help in your area. Eviction rules vary a lot by state and city, so check your state and local rules and contact legal aid if you get a notice.

Self-employed and gig workers

Regular unemployment may not cover you, but after a declared major disaster, DUA may. Keep records of your income (invoices, deposits, tax returns) in your important papers, because you may need to prove what you earned.

Quick checklist

- ☐ Open a separate savings account and set up a small automatic transfer after each payday
- ☐ Write down your own rules for what counts as a money emergency
- ☐ Make a simple budget and mark your "must pay first" bills
- ☐ Add a money page (banks, lenders, insurers, utilities, landlord) to your important papers, with no passwords
- ☐ Keep some cash in small bills with your emergency kit
- ☐ Know how to find your state's unemployment insurance program, and file right away if you lose work
- ☐ Save 211 in your memory: dial 211 or visit 211.org for local help
- ☐ Call lenders, landlords and utilities before you miss a payment
- ☐ Skip payday loans and anyone who asks you to pay for a job or deposit a check and send money back

Chapter 25: Stranded: In Your Car or Outdoors

Most emergencies in this book find you at home. This one finds you somewhere else: in a car that slid into a snowy ditch, on a hot desert road with a flat tire and no cell signal, or on a hiking trail that suddenly doesn't look familiar. Being stranded is usually a waiting game. Help is coming, but it may take hours, and your job is to stay safe, stay put and make yourself easy to find.

This chapter covers what to do before a trip so someone knows to look for you, what to do if you're stuck in your car in cold or hot weather, what to do if you're lost or stranded outdoors, the "Ten Essentials" that the National Park Service recommends carrying, and how emergency beacons and satellite messengers fit in. It does not cover hunting, trapping or eating wild plants. Don't try any of those. Waiting with the water and snacks you brought is the safer plan.

Why this matters for everyday families

You don't have to be a mountain climber to get stranded. A winter storm can stop traffic on an interstate. A rural road can wash out. A day hike with the kids can run long when someone twists an ankle. Phones help a lot, but they don't work everywhere. The National Oceanic and Atmospheric Administration (NOAA) points out that mobile phones do not always work in remote areas, and the National Park Service (NPS) warns visitors to some desert parks that GPS navigation apps don't always work there.

The good news is that the steps that keep you safe are simple, and most of them happen before you leave the driveway.

Before you go: leave a trip plan

The single best thing you can do is tell someone where you're going and when you'll be back. The NPS says to tell someone where you're going and when to expect you back. The USDA Forest Service goes further: give a trusted person exact details of where you're going, the trail you plan to follow, when you'll return, and what vehicle you're driving and where it will be parked.

For a long drive through empty country, the same idea applies. The NPS desert driving checklist includes a return plan filed with a friend or relative.

A trip plan can be a text message or a note on the kitchen counter. Here's what to put in it:

- ☐ Where you're going, and the route or trail you plan to take
- ☐ Who is with you
- ☐ What vehicle you're driving (make, color, plate) and where you'll park
- ☐ When you expect to be back, and the time at which the person should call for help if they haven't heard from you
- ☐ Your phone number and the phone numbers of others in the group

If you change your plans, tell your contact. Then check in when you get back, so nobody calls out a search for a person who is already home eating dinner.

The NPS also suggests making an outdoor emergency plan and practicing it before you leave. Each trip and activity may have special needs, so adjust the plan to fit the trip.

Before any long drive

Chapter 5 covers what to keep in your car kit, and Chapter 17 covers getting a car ready for winter. A few extra points for trips through remote areas:

- Fill up before you leave the last town. The NPS reminds desert drivers that there are no gas stations in some remote parks.
- Carry extra drinking water in the car. Death Valley National Park advises carrying extra drinking water in your car in case of emergency.
- Bring extra food, water and any medicines you need to last several days if you're heading onto back roads. That's on the NPS desert driving list.
- Know how to change a tire and make sure the jack and spare work. The NPS notes that tow companies can be hours away in remote places.
- Download maps for offline use before you lose signal. Death Valley warns that phone and internet service is limited around the park and suggests saving information for offline use. Don't trust a phone app to route you down an unknown dirt road.

Stranded in your car in winter

Snow and ice can stop traffic for hours, and a car that slides off a quiet road can leave you waiting a long time for help. The National Weather Service (NWS) gives clear advice for this, and the first rule is the most important one.

> **Caution:** Stay in the vehicle. The NWS warns that if you leave your car, you will become disoriented quickly in wind-driven snow and cold. Your car is shelter, and it's much easier for rescuers to find than a person on foot.

What to do, in order

1. If snow or fog makes it hard to see, pull over to the side of the road and stop until you can see again. When you're stopped, turn off your driving lights and set the parking brake, so another driver doesn't follow your taillights and hit you.
2. If you have a signal, I'd call 911 and tell them where you are and how many people are with you. Then save your phone battery. (The NWS lists a fully charged mobile phone as something not to leave home without in winter.)
3. Clear snow away from the exhaust pipe. A blocked tailpipe can push exhaust gas into the car.
4. Run the motor about 10 minutes each hour for heat. While it runs, open a window a little for fresh air to avoid carbon monoxide poisoning.
5. Make yourself easy to spot. Turn on the dome light at night while the engine runs. Tie a bright cloth, red if you have one, to the antenna or a door. Once the snow stops falling, raise the hood to show you need help.
6. Every so often, move your arms, legs, fingers and toes hard to keep your blood moving and stay warmer.

7. Don't overdo it. The NWS warns against shoveling heavy snow, pushing a car or walking in deep snow if you're not in good health, because the strain from the cold and hard work can cause a heart attack. Sweating can also lead to a chill and hypothermia.

Carbon monoxide (CO) is a gas you can't see or smell. It comes from engine exhaust, and it can make you sick or kill you in a closed space. That's why the tailpipe check matters so much. Check it again every time you get out of the car, because blowing snow can fill it back in.

Caution: Don't run the engine nonstop while you wait, and never while everyone is asleep. Run it in short spells, about 10 minutes each hour, with a window open a little and the tailpipe clear. The Centers for Disease Control and Prevention (CDC) lists headache, dizziness, weakness, upset stomach and confusion among the most common signs of CO poisoning, and it warns that people who are sleeping can die from CO before they have any symptoms. If anyone feels these signs, turn the engine off and get fresh air. Chapter 9 covers carbon monoxide in more detail.

Staying warm while you wait

Pile on whatever you have: blankets, extra coats, hats, gloves. Huddle together. Cover the windows with a coat or blanket at night to hold in some heat, but keep that one window cracked when the engine runs. Take turns sleeping, so someone is always awake to run the engine on schedule and watch for help.

You might ask, "Should I eat snow if I run out of water?" No. The NWS warns that eating unmelted snow will lower your body temperature. If you have a way to melt snow, melt it first.

Chapter 17 covers frostbite and hypothermia (a dangerous drop in body temperature), including the warning signs and first steps.

Stranded in your car in hot weather

A breakdown in the heat is a different kind of danger. In winter the car keeps you warm. In summer a parked car can become an oven, and walking for help across open ground in the heat can kill.

Death Valley National Park, one of the hottest places in the country, gives plain advice: if your car breaks down, stay with it until help comes. The park also warns that heat can be deadly even when temperatures are in the 80s and 90s.

Caution: If your car breaks down in hot, remote country, stay with it. Don't set off walking across the desert to find help. A car is much easier for rescuers to spot than a person, and walking in the heat drains your water fast.

What to do

The Arizona Department of Transportation (ADOT) gives practical steps for a breakdown in extreme heat. I've put them in the order I'd take them.

1. Get the car off the road as far as you safely can. ADOT says to avoid parking in tall brush.
2. Call for help right away. ADOT says calling for assistance right away shortens your wait. Call 911 if anyone is in danger or you're in a dangerous spot.

3. Raise the hood and turn on your hazard lights so others can see you need help.
4. Run the air conditioning while you wait, if the car will run. If the air conditioning doesn't work, ADOT says to roll down all the windows.
5. If the inside of the car gets too hot, get everyone out carefully, pets too, and find or make shade as far from the traffic lanes as you can. An umbrella helps. The pavement can be hot enough to burn skin, so keep your shoes on and keep pets' paws off it.
6. Drink your water, and make sure everyone, pets included, keeps drinking. Don't try to save water by not drinking. In summer, Death Valley National Park advises drinking at least one gallon (4 liters) of water a day to replace what you lose through sweat, and more if you're active. Plan on that much for each person in the car.
7. Rest, and protect yourself from the sun with a wide-brimmed hat and light clothing. Death Valley also suggests dampening your clothes to help lower your body temperature.

Watch everyone in the group for heat illness. Death Valley National Park says that if you feel dizzy or sick to your stomach, or get a headache, get out of the sun right away and drink water or a sports drink. Watch for these signs in others, too. Chapter 18 covers the difference between heat exhaustion and heat stroke, and what to do for each.

Stay on roads you can handle

Many desert rescues start with a car that never should have left the pavement. The NPS says most rescues on its desert back roads involve vehicles stuck in sand, and others involve mechanical breakdowns. Death Valley advises visitors to stay on paved roads in summer and stay close to their vehicle. If your phone's map app suggests a "shortcut" down a dirt road, skip it.

Never leave anyone in a parked car

This chapter is about being stranded, but the most common hot-car danger happens in a parking lot. Never leave a child, an older adult or a pet in a parked car in warm weather, not even for a minute. Chapter 18 covers this in detail.

Other car emergencies

A few car dangers are covered in other chapters:

- Water over the road: Turn Around Don't Drown. Just 12 inches of fast-moving water can carry away a small car. Chapter 13 covers what to do if your car is caught in floodwater.
- Downed power lines on or near your car: Chapter 10 covers what to do.
- A tornado while you're driving: Chapter 12 covers your options.
- Wildfire smoke or flames near the road: Chapter 14 covers evacuating by car.

Lost or stranded outdoors

Getting lost on a hike is scary, but most lost people are found, and the ones who stay put are found faster. Here is what to do, in order.

First, STOP

The USDA Forest Service teaches a simple memory word: STOP, which stands for Stop, Think, Observe and Plan. As soon as you realize you may be lost, stop, stay calm and stay put. The Forest Service calls panic your greatest enemy.

- **Stop.** Stand still and stay calm. Sit down if it helps.
- **Think.** Go back over how you got here and what landmarks you should be able to see. The Forest Service says not to move at all until you have a specific reason to take a step.
- **Observe.** Use a compass, if you have one, to get your bearings. Don't walk aimlessly. If you're on a trail, stay on it.
- **Plan.** Based on what you thought through and what you saw, come up with a few possible plans, think them through, and then act on one.

Stay put unless you're sure

The Forest Service says that if you're not very, very confident of the route, it's always better to stay put. It also says to stay in place if night is falling, if you're hurt, or if you're near exhaustion.

Why stay put? Because searchers start where you were last known to be, along the route you told someone about. If you keep moving, you can walk away from the people looking for you. That's one more reason the trip plan matters.

If you have a phone signal, call 911. The NPS printed emergency plan says that if you can't retrace your steps, call 911 and tell them where you are: GPS coordinates if your phone shows them, the trail or area name, and landmarks you can see. After the call, save your battery by turning off apps you don't need.

Make yourself easy to find

Rescuers look for things that don't belong in nature: bright colors, flashes of light, noise and smoke.

- **A whistle.** The NPS emergency plan lists packing a whistle. Its printed plan gives a simple signal: blow your whistle three times, take a break, and blow three times again. A whistle carries much farther than your voice and takes far less energy.
- **A mirror.** The NPS also lists packing a mirror. Flashing it helps signal people if you're lost, and a mirror never runs out of battery.
- **Bright clothing.** The NPS says bright clothing makes you easier to see if search and rescue needs to look for you.
- **A light.** The NPS notes that a flashlight or headlamp can help you find your way out or signal for help at night.
- **A fire, where it's safe and allowed.** The NWS says a fire can provide heat and attract attention. Know the local fire rules before you go, as the NPS advises. I'd keep a fire small, clear the ground around it, never leave it, and skip it in dry, windy conditions where it could spread.

Stay in an open spot near where you stopped, if you can, so you can be seen from above.

Stay warm and dry

Wet clothes and wind pull heat from your body fast, even on a cool summer night. The NWS says to try to stay dry and cover all exposed skin. If there's no shelter nearby, it suggests building a lean-to, windbreak or snow cave to get out of the wind, and putting rocks around a fire to soak up and reflect its heat.

The Forest Service suggests dressing in layers you can add or remove as the weather changes, and carrying extra socks in case the pair you're wearing gets wet. It also suggests a blanket, a flashlight and matches in a water-resistant container in case you have to spend a night out.

Some simple shelter basics:

- Get out of the wind first. A big rock, a fallen log or a thick stand of trees helps.
- Put something between you and the ground: a pack, branches, a jacket. Cold ground pulls heat out of your body.
- An emergency space blanket or a tarp is light and easy to carry. The NPS lists a tent, tarp, bivy sack (a small waterproof cover for a sleeping bag or a person) or space blanket as light shelter options.
- Change into dry socks and layers before you get chilled, not after.

Water

Running out of water is a real risk, especially in hot weather. Drink before you're thirsty. The NPS says that if you're active outdoors, especially in hot weather, you should drink water often and before you feel thirsty.

If you need to drink from a stream or lake, treat the water first. The CDC warns that water with germs that can make you sick sometimes looks clean, and that drinking straight from even a clear mountain stream is generally not safe.

Method	What the CDC says it does	Notes
Boiling	Best way to kill germs, including viruses, bacteria and parasites	Rolling boil for 1 minute; 3 minutes above 6,500 feet
Filter with pore size of 1 micron or smaller	Removes parasites	Does not remove all bacteria or viruses
Filter with pore size of 0.3 micron or smaller	Removes bacteria and parasites	Does not remove viruses
Chlorine bleach or iodine	Kills bacteria and viruses	Does not work well to kill parasites
Chlorine dioxide tablets	Can kill Giardia; somewhat effective against Cryptosporidium	Follow the product directions
Portable UV (ultraviolet) light	Kills germs in small amounts of clear water	Does not work well in cloudy water

A micron is one-millionth of a meter, far smaller than you can see. The pore size is printed on the filter package. Chapter 3 covers making water safe at home, including how to use bleach. CDC says chlorine dioxide works against Cryptosporidium when you follow the label and wait the full time.

If you go to the bathroom outdoors, the CDC advises burying human waste at least 8 inches deep and at least 200 feet from lakes, rivers and streams, so it doesn't foul the water you or others will drink.

Teach kids what to do if they get lost

Children who get lost often hide, keep walking, or are afraid they'll be in trouble. The NPS outdoor emergency plan has a short message for kids that's worth repeating before every outing: being lost is OK, your family is not mad at you, and they are worried and looking for you.

The NPS gives kids three steps (the short explanations are mine):

1. Hug a tree. Pick one spot and stay there, so searchers can find you.
2. Keep warm and dry.

3. Make yourself big. Stand in the open, wave, and make noise so searchers can see and hear you.

Give each child a whistle and a bright jacket or vest, and practice with them. Make it a game: "If you can't see us, you hug a tree and blow the whistle." If a child in your group goes missing, the NPS says to stop the activity, go back to the last place you saw them, call 911 if you have cell service, or go to a ranger station.

The Ten Essentials

The NPS describes the Ten Essentials as a set of items that can help you or others with minor injuries, sudden weather changes or unexpected emergencies. You don't need to carry all ten for a short walk in a city park. For any hike away from town, they're the right starting point.

Item	What it covers	Notes from the NPS
Navigation	Map, compass, GPS	Know how to use them before you go; bring a paper map as backup and an extra phone battery
Sun protection	Sunglasses, sunscreen, hat	Long sleeves and pants also help
Extra clothing	Jacket, hat, gloves, rain shell, layers	Pack for the worst weather you could meet; bright colors help searchers see you
Illumination	Flashlight or headlamp	Headlamps are hands-free; pack extra batteries
First aid supplies	First aid kit	Start with a ready-made kit; add your own medicines; check expiration dates
Fire	Matches or lighter, fire starters	Waterproof matches are best; know the park's fire rules
Repair kit and tools	Duct tape, knife, multi-tool, scissors	Add tools for your activity
Nutrition	Extra food	An extra day's supply of no-cook food
Hydration	Water and water treatment supplies	Drink often, before you feel thirsty
Emergency shelter	Tent, space blanket, tarp or bivy sack	Light options that protect you from the weather

Tip: Keep a small "trail bag" packed with the Ten Essentials so you can grab it for any outing. Check batteries, food and medicines a couple of times a year, the same way you check your home kit (Chapter 5).

Emergency beacons and satellite messengers

Where there's no cell signal, two kinds of devices can call for help.

A personal locator beacon (PLB) is a small handheld radio beacon made to be carried by one person. When you turn it on in an emergency, it sends a distress signal on the 406 MHz radio frequency (MHz means megahertz, a measure of radio frequency) to a worldwide satellite system. NOAA says these beacons are designed to alert search and rescue authorities directly within minutes, with your location coordinates. Boats use a similar beacon called an EPIRB (emergency position-indicating radio beacon), and aircraft use an ELT (emergency locator transmitter).

Caution: If you own a U.S. coded 406 MHz beacon, you must register it with NOAA. NOAA says registration

is required by law and free of charge. Register at beaconregistration.noaa.gov. Registration is good for only two years, so re-register every two years, and update it whenever your contact information changes. NOAA notes that rescue authorities may contact you if the beacon is turned on.

A satellite messenger is a different kind of handheld device that can send messages and call for help by satellite. The NPS lists a satellite phone or satellite messenger as recommended equipment for remote desert driving. Devices and service plans differ a lot, so learn exactly what yours can do, and what it costs, before you count on it.

Either device is a backup, not a plan. It doesn't replace telling someone where you're going, carrying the Ten Essentials, or staying put once you're lost. Learn how yours works at home, and keep it charged or check its battery date before each trip.

Special notes

Older adults and people with medical needs

Carry extra doses of any daily medicines on every trip, even a short drive, along with a list of your medicines and doctors. Cold and heat both hit harder when you have heart or lung problems, and the NWS warns that the strain of cold and hard work can cause a heart attack. Let others in the group do the digging and pushing.

People with disabilities

If you use a wheelchair, oxygen or other equipment, add that equipment to your trip plan, so rescuers know what to bring. Keep spare batteries or a charger in the car.

Pets

If your pet travels with you, pack water, food and a leash for it in the car kit. Pets get cold and overheated too. Chapter 5 covers a pet kit.

Quick checklist

- ☐ Leave a trip plan with someone every time: where, route, who, vehicle, and when you'll be back
- ☐ Fill the tank and download offline maps before remote drives
- ☐ Keep extra water, food, medicines and warm clothes in the car (Chapter 5)
- ☐ In a winter breakdown, stay in the car, clear the tailpipe, and run the engine about 10 minutes each hour with a window cracked
- ☐ In a hot-weather breakdown, stay with the car, stay in shade and drink your water
- ☐ If lost outdoors, STOP: stop, think, observe, plan, and stay put
- ☐ Carry a whistle, a mirror and something bright, and know the signal: three blasts, a break, three more
- ☐ Treat water from streams and lakes before drinking
- ☐ Teach kids to hug a tree, stay warm and dry, and make themselves big
- ☐ Register any 406 MHz beacon with NOAA, and re-register every two years

Part 3: After It Happens

Chapter 26: After the Disaster: Recovery

The storm has passed, the water has gone down or the fire is out. Now comes the long part. Recovery is the weeks and months of getting back into your home, cleaning up, dealing with insurance and aid programs, and getting your family's life back to normal. It's slower and less dramatic than the emergency itself, but more people get hurt, cheated or worn out in this stage than you might think.

This chapter covers how to return home safely, how to clean up without hurting yourself, how to document damage for insurance, how federal disaster help from the Federal Emergency Management Agency (FEMA) and the U.S. Small Business Administration (SBA) works, how to spot recovery scams, and how to look after your family and your neighbors along the way. It's not legal or financial advice. For questions about your own policy or claim, talk to your insurance company, the agency that runs the program, or a lawyer.

After a disaster, the hardest work often begins after the storm passes and the news cameras leave. Rebuilding takes patience, clear priorities and neighbors willing to help. In my own life I have learned that recovering from any major setback happens one step at a time, leaning on God and the people around you.

First rule: wait until it's safe

You might ask, "It's my house. Why can't I just go back?" It's simple: officials can see things you can't, like washed-out roads, live power lines, gas leaks and damaged bridges. The Centers for Disease Control and Prevention (CDC) says to follow guidance from local authorities and go back home only once you've been told it's safe.

When you do go back:

- Go in daylight if you can. The CDC suggests returning during the day so you don't have to use any lights.
- Expect the basics to be missing. The CDC says to assume your home may have limited or no utility services, like power, water, sewer and trash pickup.
- Bring your emergency kit, water, food, a flashlight, a phone charger, and protective gear (covered later in this chapter).
- Leave young children and pets with someone else for now. The CDC advises keeping children and pets away from the affected area until cleanup is done.

Chapter 7 covers coming home after an evacuation, and Chapter 13 covers returning to a flooded home in more detail.

Coming home safely

Look before you go in

Walk around the outside first. The CDC says not to go inside if there's obvious damage, like downed power lines, downed trees, or cracks in your home's walls or foundation. Have a professional inspect the home before you enter. For a flooded home, the CDC says not to reenter a damaged home until a building inspector has examined it for safety.

Caution: Assume every downed power line is live. The American Red Cross says to stay at least 35 feet away from a fallen power line and anything it is touching. Call 911 to report it, and let the utility know too.

Chapter 10 covers downed lines.

Gas

If you smell gas or think there's a leak, the CDC says to turn off the main gas valve, open all the windows and leave the house right away. Then tell the gas company, the police or fire department, or the State Fire Marshal's office. Don't turn on the lights or do anything that could cause a spark, and don't go back in until you're told it's safe. Once the gas is off, never turn it back on yourself. The Earthquake Country Alliance says only utility workers or qualified plumbers can restore it, and after a big disaster that can mean a long wait. Chapter 9 covers gas shutoffs.

Electricity

Water and electricity don't mix. The CDC says never to turn the power on or off, or use an electric tool or appliance, while it's wet or while you're standing in water. If you'd have to step into standing water to reach the main power switch, call an electrician to turn it off. If wiring or electrical equipment got wet or is near water, CDC cleanup guidance says to turn off the power at the main breaker or fuse on the service panel, as long as you can reach it without stepping into water.

Light without flames

Use battery-powered flashlights and lanterns. The CDC says to use them rather than candles, gas lanterns or torches. A damaged house can have gas in the air, and a candle is the last thing you want near it.

Carbon monoxide

Carbon monoxide (CO) is a poison gas you can't see or smell. It comes from engines and anything that burns fuel. After disasters, it often comes from generators, pressure washers and pumps used during cleanup.

Caution: Never use a generator, pressure washer, camp stove, or any gasoline, propane, natural gas or charcoal-burning device inside your home, basement or garage. The CDC says to keep generators outside and at least 20 feet from any windows, doors or vents, and to use a battery-operated or battery-backup CO detector any time you run one.

Chapter 9 covers the signs of CO poisoning, and Chapter 10 covers generator safety.

Floodwater, food and drinking water

Stay out of floodwater. The CDC warns it can contain germs, chemicals and other things that can hurt you or make you sick. If floodwater touches your skin, wash with soap and clean water as soon as you can. If you don't have soap or clean water, use alcohol-based wipes or hand sanitizer.

For food, the CDC says to throw away any food that may have touched floodwater or stormwater, even if it looks and smells fine. When in doubt, throw it out. Chapter 4 covers what to keep and what to toss after a power outage.

For water, follow your local officials on whether tap water is safe to drink or use. If you have a private well and your area flooded, the CDC says to get the water tested before you use it. Chapter 3 covers boil water notices and making water safe.

Mold

Mold is a fungus that grows on damp surfaces. It can start fast. FloodSmart, the federal flood insurance program's website, says mold can start forming within 24 to 48 hours of flooding, and the CDC says that if your home flooded and was closed up for several days, you should assume it has mold. The CDC also says mold may be growing even if you can't see it.

Ready.gov says people with asthma or other lung conditions, or with weakened immune systems, should stay out of buildings with mold or water leaks. Let others do that cleanup. Chapter 13 covers mold in more detail.

Cleanup safety

Cleanup is hard, dirty work, often in heat, with sharp debris everywhere. It's easy to get hurt when you're tired and in a hurry, so slow down.

Get the right gear

The CDC recommends this gear for disaster cleanup:

Gear	Why
N95 mask (or a respirator with a higher level of protection)	Protects your lungs from mold and dust
Heavy work gloves	Protects your hands from sharp debris
Waterproof boots with a steel toe and insole	Protects your feet from nails and heavy objects; a steel shank alone isn't enough
Goggles or other eye protection	Protects your eyes from splashes, dust and mold
Rubber boots and rubber gloves	Needed when sewage is involved

An N95 is a fitted mask that filters out small particles when it seals well to your face.

Work smart, not hard

The CDC gives practical cleanup advice that's easy to forget when you're overwhelmed:

- Decide which tasks matter most, and do those first.
- Work outdoors during the cooler hours of the day, and rest when you need to. Drink water, especially when it's hot.
- Have teams of at least two people move heavy or bulky things. The CDC says to avoid lifting anything over 50 pounds per person.
- If you get a cut or sore that touched floodwater, clean it and put on antibiotic ointment. Get medical care right away if you're hurt or get sick. Chapter 8 covers wound care and tetanus shots.
- Wash up with soap and water when you're done, and wash cleanup clothes in hot water and detergent.

Drying out and cleaning

The CDC says to clean up and dry your home within 24 to 48 hours after the storm or flood ends, if you can.

1. Open doors and windows to air out the house before you spend time inside. Use fans to dry wet areas.
2. Throw away items that soaked up water and can't be cleaned, like rugs, mattresses and stuffed animals. Take photos first (see the next section).
3. Clean wet items and hard surfaces with hot water and laundry or dish detergent.

4. If you use bleach, open windows and doors first, and never use it in a closed space. The CDC says to use no more than 1 cup of household laundry bleach in 1 gallon of water.
5. Fix leaks in the roof, walls or plumbing as soon as you can, so things don't get wet again.

Caution: Never mix bleach with ammonia or any other cleaner. The mix can give off toxic gas. Chapter 20 explains why.

Chain saws

Storms leave fallen trees, and the CDC says about 36,000 people a year are treated in hospital emergency departments for chain saw injuries, with the risk going up after hurricanes and other disasters. If you've never used one, this isn't the week to learn. Hire a professional or wait for an organized volunteer crew. If you do use one, the CDC says:

- Wear a hard hat, safety glasses, hearing protection, heavy work gloves, cut-resistant chain saw chaps that run from the waist to the top of the foot, and boots that cover the ankle.
- Run, adjust and maintain the saw the way the owner's manual says.
- Always cut at waist level or below, so you keep control of the saw.
- Stay away from power lines until they're confirmed to be shut off.
- Watch out for "spring poles," trees or branches that are bent or caught under tension. When cut, they can snap back and hit you or a bystander. The CDC advises shaving slowly at the underside so the tension releases bit by bit.
- Keep other people at least 2 tree lengths (at least 150 feet) away from anyone cutting down a tree, and at least 30 feet from anyone cutting limbs or a fallen tree.

Document the damage for insurance

Before you clean or throw anything out, take pictures. The CDC says to contact your insurance company and take pictures of your home and belongings before you start cleanup. FloodSmart says to take clear photos and video of damaged items before cleaning, fixing or throwing them out.

What to photograph

FloodSmart suggests these shots:

- ☐ Wide shots and close-ups of walls, floors and furniture
- ☐ Water lines on walls, furniture and appliances
- ☐ Structural damage to floors, ceilings and foundations
- ☐ Serial numbers on electronics and appliances
- ☐ Every damaged item before it goes to the curb

FloodSmart also suggests keeping small samples of damaged materials, like pieces of carpet, drywall or insulation, for the insurance adjuster. After you've taken photos, throw out anything that could be a health risk, like spoiled food and moldy clothing.

Tip: Start a simple recovery notebook or a note on your phone. Write down every call: the date, the person's

name, what they said and any claim or case number. It saves a lot of grief later.

Filing your claim

1. Call your insurance company or agent as soon as you can. FloodSmart says to contact your insurer as soon as possible to check your coverage and next steps.
2. Give them your policy number and a way to reach you. Chapter 2 covers keeping copies of policies in your important papers.
3. Share your photos, video and list of damaged items.
4. If you start repairs before your claim is settled, save every receipt for repairs and for things you buy to replace what was lost. FloodSmart gives this advice.
5. Talk to your insurance company before you sign a repair contract or pay a contractor. FloodSmart gives this advice too.

Remember that a homeowners or renters policy and a flood policy are usually separate. Chapter 2 and Chapter 13 cover what each kind of policy does and doesn't cover. FloodSmart notes that mold damage is not covered under standard National Flood Insurance Program (NFIP) policies, so dry things out fast. There are exceptions: the policy may cover mold if officials kept you out because of hazards like fallen trees, power lines or damaged roads, or if floodwater is still in or around your home, making it unsafe to inspect or clean.

Help from FEMA

When a disaster is big enough, the President can declare a major disaster for an area. That opens federal help for people who live there. FEMA's main program for households is called Individual Assistance, and its Individuals and Households Program gives money and other help to people who qualify.

What FEMA help can and can't do

FEMA help is meant to get you safely housed and on your feet. It is not insurance, and it won't make you whole. DisasterAssistance.gov, the federal government's website for applying, puts it plainly: FEMA's programs do not replace insurance, and they cannot cover all disaster-related losses.

Other key points from DisasterAssistance.gov:

- By law, FEMA cannot pay you twice for losses your insurance already covers.
- You may still qualify for FEMA help even if you have insurance, for example if your policy doesn't cover everything.
- File a claim with your insurance company as soon as possible.
- If your insurance settlement is delayed more than 30 days after you filed, you may be able to get FEMA help, but it's an advance that you must pay back.
- Most federal disaster help comes as low-interest loans from the SBA, which you have to repay.

FEMA housing help, according to DisasterAssistance.gov, can include:

Type of help	What it's for
Rental assistance	To help you rent somewhere else to live
Lodging expense reimbursement	To pay you back for short stays in hotels, motels or other short-term lodging

Type of help	What it's for
Home repair assistance	To repair an owner-occupied primary home, its utilities and related parts
Home replacement assistance	To help replace an owner-occupied primary home

To get housing help, your home generally has to be in the declared disaster area and be unlivable or impossible to reach, and the need can't already be covered by insurance or another source.

FEMA's Individuals and Households Program page also lists help for other uninsured or underinsured costs and serious needs caused by the disaster, such as repairing or replacing personal property and vehicles, moving and storage, and medical, dental, child care and funeral costs. FEMA says this help is not a substitute for insurance and can't make up for all your losses. To qualify, you must, among other things, be a U.S. citizen, non-citizen national or qualified alien, pass an identity check, and still have needs after insurance and other help.

How to apply

Way to apply	Details
Online	DisasterAssistance.gov
By phone	FEMA Helpline 1-800-621-3362, 7 days a week. DisasterAssistance.gov listed 7 a.m. to 1 a.m. Eastern Time in October 2026; hours can change after a big disaster. If you use a relay service such as a videophone or captioned phone, give FEMA the number for that service.
TTY and relay	TTY 1-800-462-7585; 711 or video relay service (VRS) also available on the Helpline
In person	A Disaster Recovery Center, where staff can explain FEMA and other programs and answer questions about your application

DisasterAssistance.gov says it helps to gather your information and have it ready before you apply. Making an online account takes your date of birth and Social Security number. Have your address, your insurance information, and a way for FEMA to reach you. Your damage photos and recovery notebook will help here too.

After you apply, you'll get a letter about your application. If you disagree with FEMA's decision, you can appeal. DisasterAssistance.gov says you must appeal within 60 days of the date on your letter. Read the letter carefully. Sometimes all it takes is a missing document.

Tip: Keep your FEMA registration number with your important papers and in your phone. You'll need it every time you call.

SBA disaster loans for homeowners and renters

Many people are surprised to learn that the U.S. Small Business Administration lends to households, not just businesses. After a declared disaster, the SBA offers low-interest loans to homeowners and renters whose home or belongings were damaged in the disaster area. The loans cover losses not fully covered by insurance or other sources.

SBA home and personal property loans	Details from the SBA
Home repair or replacement	Homeowners may borrow up to $500,000 to repair or replace their primary home
Personal property	Renters and homeowners may borrow up to $100,000 to repair or replace belongings
First payment	Deferred for 12 months, with no interest building up during the first 12 months
Interest rate	Fixed, not more than 4% for people who can't get credit elsewhere (the SBA decides this)
Term	Up to 30 years, with no prepayment penalty or fees
Not eligible	Second homes and vacation homes
How to apply	Online through the SBA's disaster loan site (start at sba.gov/disaster) or call 1-800-659-2955

Insurance money you receive may be subtracted from the amount you can borrow. A loan still has to be paid back, so borrow only what you need, and read every page before you sign.

Watch out for recovery scams

Scammers follow disasters. They know people are stressed, in a hurry and expecting money from insurance or the government.

Contractor scams

The Federal Trade Commission (FTC), the federal agency that protects consumers, gives this advice for hiring help after a disaster:

- Get estimates from more than one contractor, and don't automatically pick the lowest bid.
- Check out a contractor before you agree to anything: confirm the license and insurance, and see what others say on review sites you trust.
- Get a written contract and read it carefully.
- If they want cash up front, walk away. Don't make the final payment until the work is done and you're happy with it.
- Pay by credit card or check. Never pay by wire transfer, gift card, payment app, cryptocurrency or cash.
- Never sign your insurance check over to a contractor.

FEMA and government impersonators

FEMA doesn't charge application fees. The FTC says that if someone wants money to help you qualify for FEMA funds, it's a scam. The FTC's warnings about FEMA impersonators add more:

- FEMA employees will never ask for money for inspections, disaster assistance, debris removal or grants. Anyone who says they work for FEMA but asks for money or financial information is a scammer.
- FEMA inspectors won't ask for your banking information.
- FEMA staff and their contractors always wear an official badge with their name and photo. Scammers sometimes make fake badges or wear FEMA clothing, though, so a badge alone doesn't prove much.
- Don't respond to unexpected calls and texts. FEMA only contacts people who have contacted FEMA or applied for help, and it never sends texts demanding money or personal information.

If you're unsure about someone who says they're from FEMA, the FTC says to contact FEMA directly at 1-800-621-3362. Apply only through DisasterAssistance.gov, the FEMA Helpline or a Disaster Recovery Center.

Report it

If you think you've spotted a scam, report it to the FTC at ReportFraud.ftc.gov. If you have a problem with a contractor you can't work out, the FTC lists your state attorney general as one place to get help. Chapter 24 covers other money scams that pop up in hard times.

Take care of yourself and your family

Recovery is exhausting. It's normal to feel sad, angry, numb or worried, and to have trouble sleeping. These feelings can show up weeks later, when the adrenaline wears off and the paperwork piles up.

The CDC suggests talking calmly with your children about what you've been through and telling them they're safe. It also suggests keeping an eye on the news and social media your kids see. As Chapter 8 explains, getting back to normal routines, like family meals and school, as soon as you can helps too.

Help is a phone call or text away:

Who	How to reach them	What they do
Disaster Distress Helpline	Call or text 1-800-985-5990	Free, 24/7 support for emotional distress after a disaster
988 Suicide and Crisis Lifeline	Call or text 988	24/7 help in a mental health or suicide crisis
211	Call 211 (some areas also take texts or chats)	Local disaster resources and services

Chapter 8 covers mental health after disasters in more detail.

Helping others

Once your own family is safe, you may want to help your neighbors and your community. That's a good instinct, and there's a right way to do it.

- **Give cash, not stuff.** Ready.gov says the best way to help after a disaster is to donate cash to nonprofit organizations. FEMA explains why: cash lets those groups buy or provide what survivors actually need, while an overflow of donated goods can quickly exceed what a community needs and pull workers away to manage it.
- **Give to groups you trust.** Ready.gov says to donate to or volunteer with a reputable organization.
- **Volunteer through an organized group.** After past disasters, FEMA has asked volunteers not to head into the affected area on their own, without a group. Ready.gov points to National Voluntary Organizations Active in Disasters (NVOAD), a network of groups that help in disasters.
- **Get trained before the next one.** Ready.gov suggests joining a Community Emergency Response Team (CERT) program, which trains people in basic disaster response skills.

Checking on the older adult next door, sharing a generator cord safely outdoors, or watching a neighbor's kids while they meet an adjuster are all real help too.

Rebuilding stronger

Recovery is also a chance to make the next disaster less painful. As you repair, ask what would have helped this time:

- **Insurance.** Did your policy cover what you thought it did? Review it with your agent. Chapter 2 covers insurance basics, and Chapter 13 covers flood insurance.
- **Your home.** If you're rebuilding after a flood, wildfire, earthquake or windstorm, ask your contractor and your local building department about ways to make the home tougher. Chapter 13 covers flood protection, Chapter 14 covers wildfire home hardening, and Chapter 15 covers securing your home for earthquakes.
- **Your plan and kit.** What did you wish you had? Write it down now, while you remember, and add it to your kit and plan. Chapters 2 and 5 cover these.
- **Your papers.** If you scrambled to find documents, set up a waterproof folder and secure digital copies. Chapter 2 covers this.

Special notes

Renters

Renters can get help too. The SBA lends renters up to $100,000 to repair or replace personal property, and FEMA rental assistance can help pay for another place to live. Tell your landlord about damage in writing right away, and take your own photos. FloodSmart points out that your landlord's insurance won't protect your belongings, and that renters insurance typically doesn't include flood. Chapter 13 covers contents-only flood coverage for renters.

Older adults and people with disabilities

Cleanup and paperwork can be overwhelming. Ask a family member, neighbor or volunteer group to help with heavy work, and ask for help with forms if you need it. Disaster Recovery Centers have staff who can answer questions about your application in person. Replace medicines, glasses, hearing aid batteries and medical equipment first.

Kids and pets

Keep children and pets out of damaged areas until cleanup is done, as the CDC advises. Kids can still help in safe ways, like sorting photos to dry or making a list of what to replace, which gives them a sense of control.

Quick checklist

- ☐ Go home only after officials say it's safe, and go in daylight
- ☐ Don't enter if you see major damage; get it inspected
- ☐ If you smell gas, leave and call from outside
- ☐ Keep generators and pressure washers outside, at least 20 feet from doors, windows and vents
- ☐ Wear an N95, gloves, goggles and sturdy boots for cleanup
- ☐ Photograph and video all damage before cleaning or throwing things out
- ☐ Call your insurance company as soon as you can, and keep every receipt
- ☐ Apply for FEMA help at DisasterAssistance.gov or 1-800-621-3362 if your area is declared
- ☐ Never pay up front in cash, and never pay anyone to help you get FEMA aid
- ☐ Save 1-800-985-5990, 988 and 211 in your phone

Part 4: Checklists and Forms

Chapter 27: Checklists and Forms

This chapter is the part of the book you'll actually write in. Every form here matches a chapter, so if a blank stumps you, flip back to that chapter. Fill them out in pencil, because phone numbers, medicines and kids' schools change. You have my permission to copy these pages for your own household.

Once they're filled out, keep a copy with your home kit, a copy in each go-bag, and a photo of each page on your phone. A plan that only lives in your head won't help the person who has to use it when you're not there.

How to use these forms

- Start with the Family Emergency Plan and the Emergency Contacts. Those two pages do the most good for the least effort.
- Fill out one Medical and Medication List for each person in the house.
- Use the kit checklists when you shop. Check off what you have and buy a few missing items each trip.
- Review everything at least once a year, and any time your household changes (a new baby, a move, a new job, a new pet, a new medicine).

Numbers to keep by the phone

Copy these onto Form 2 and into every phone in the house. Chapters 8, 24 and 26 explain each one.

Who	Number	When to use it
Emergency	911	Anyone hurt, trapped or in danger
Poison Help (Poison Control)	1-800-222-1222	Someone swallowed, breathed in or touched something harmful
988 Suicide and Crisis Lifeline	Call or text 988	A mental health or suicide crisis
Disaster Distress Helpline	Call or text 1-800-985-5990	Emotional distress after a disaster
FEMA Helpline	1-800-621-3362	Questions about a FEMA disaster assistance application
Local help	Dial 211	Finding local help with food, housing, utilities and recovery

Form 1: Family Emergency Plan

See Chapter 2.

Household member	Date of birth	Cell phone	Work or school

Meeting place	Address or description
Right outside our home (for a fire)	
Near our neighborhood (if we can't get home)	
Outside our town (if we have to leave the area)	

Out-of-area contact (everyone checks in with this person)	Phone	Email
Backup contact		

Who picks up the kids?	First choice	Backup
Name and phone		
School or daycare release form updated? (date)		

Our family's word or phrase to confirm a message is really from us:

Form 2: Emergency Contacts

Call 911 for any life-threatening emergency. Poison Control is 1-800-222-1222.

Contact	Name	Phone
Doctor		
Second doctor or specialist		
Pharmacy		
Veterinarian		
Electric company (outages)		
Gas company (leaks)		
Water company		
Insurance agent		
Landlord or property manager		
Neighbor		
Neighbor		
Workplace		
Workplace		
School or daycare		
School or daycare		
County emergency management office		
Other		

Form 3: Wallet Contact Cards

Cut these out, fold them, and put one in every wallet, purse, backpack and go-bag. Kids too young to carry a phone need one most.

Name:	**Name:**
Out-of-area contact:	Out-of-area contact:
Phone:	Phone:
Meeting place:	Meeting place:
Medical needs:	Medical needs:

Name:	**Name:**
Out-of-area contact:	Out-of-area contact:
Phone:	Phone:
Meeting place:	Meeting place:
Medical needs:	Medical needs:

Name:	**Name:**
Out-of-area contact:	Out-of-area contact:
Phone:	Phone:
Meeting place:	Meeting place:
Medical needs:	Medical needs:

Form 4: Medical and Medication List

One page per person. See Chapters 5 and 8.

Item	Details
Name	
Date of birth	
Blood type (if known)	
Allergies (medicines, foods, insects)	
Medical conditions	
Medical devices that need power	
Glasses, hearing aid or mobility aid	
Health insurance company and member number	

Medicine	Dose	How often	Prescribed by	Pharmacy phone

Form 5: Home Information Sheet

See Chapter 9. Write down where things are now, in daylight, so nobody has to hunt for them in the dark.

Item	Where it is	Tool needed
Main water shutoff valve		
Electrical panel (breaker box)		
Gas meter shutoff (only shut off if you smell gas or officials tell you to)		
Water heater		
Smoke alarms (locations)		
Carbon monoxide alarms (locations)		
Fire extinguishers (locations)		
Home kit		
Go-bags		
Spare house and car keys		

Insurance	Company	Policy number	Phone
Homeowners or renters			
Flood			
Earthquake (if any)			
Auto			
Health			
Life			

Form 6: Hazards Where I Live

See Chapter 1. Fill this out once, and update it if you move.

Hazard	My risk (high, medium, low)	Where I checked	Chapter
Flood			13
Tornado and severe storms			12
Hurricane			11
Wildfire and smoke			14
Earthquake			15
Tsunami, volcano, landslide			16
Winter storm and cold			17
Extreme heat			18
Chemical or pipeline accident			20
Nuclear power plant within 50 miles			21

Question	My answer
Top three hazards for my county	
My flood zone (from the FEMA Flood Map Service Center)	
My hurricane evacuation zone (coastal areas only)	
Nearest nuclear power plant and distance (if within 50 miles)	
Rail lines, highways or chemical plants near me	
Local alert system I signed up for (name and date)	
Wireless Emergency Alerts turned on in my phone? (yes or no)	
Do I have a NOAA Weather Radio? (yes or no)	
Evacuation route 1	
Evacuation route 2	
Where we'd stay if we evacuated (friend, family, hotel)	

Form 7: Water and Food Planner

See Chapters 3 and 4. The basic rule is one gallon of water per person per day. Children, nursing mothers, sick people and anyone in a hot climate need more, and pets need their own water.

Line	Fill in
A. Number of people in the house	
B. Number of days I'm planning for	
C. Gallons of water needed (A times B)	
D. Gallons I have now	
E. Gallons still to get (C minus D)	
F. Pets: water and food for how many days?	

Stored item	Amount	Date bought	Use or replace by

Water you bottle yourself should be replaced every six months. Store-bought bottled water should stay sealed in its original container in a cool, dark place.

Form 8: Home Kit Checklist

This is the Ready.gov basic kit plus the extra items Ready.gov suggests. See Chapter 5.

Basic kit

- ☐ Water: one gallon per person per day for several days
- ☐ Food: at least a several-day supply of non-perishable food
- ☐ Battery-powered or hand-crank radio and a NOAA Weather Radio with tone alert
- ☐ Flashlight and extra batteries
- ☐ First aid kit
- ☐ Whistle to signal for help
- ☐ Dust mask
- ☐ Plastic sheeting, scissors and duct tape
- ☐ Moist towelettes, garbage bags and plastic ties
- ☐ Wrench or pliers to turn off utilities
- ☐ Manual can opener
- ☐ Local maps
- ☐ Cell phone with chargers and a backup battery

Extra items to consider

- ☐ Soap, hand sanitizer and disinfecting wipes
- ☐ Prescription medicines
- ☐ Non-prescription medicines (pain relievers, anti-diarrhea medicine, antacids, laxatives)
- ☐ Prescription glasses and contact lens solution
- ☐ Infant formula, bottles, diapers, wipes and diaper rash cream
- ☐ Pet food and extra water for pets
- ☐ Cash in small bills
- ☐ Copies of important family documents (insurance, ID, bank records)
- ☐ Sleeping bag or warm blanket for each person
- ☐ Change of clothes for your climate and sturdy shoes
- ☐ Fire extinguisher
- ☐ Matches in a waterproof container
- ☐ Feminine supplies and personal hygiene items
- ☐ Mess kits, paper cups, plates, paper towels and plastic utensils
- ☐ Paper and pencil
- ☐ Books, games or puzzles for kids

Form 9: Go-Bag Checklist

One bag per person. See Chapter 5.

- ☐ A few bottles of water
- ☐ Light, no-cook snacks and bars
- ☐ Prescription medicines, with a list of names and doses
- ☐ Flashlight and batteries
- ☐ Phone charger and backup battery, charged
- ☐ First aid basics
- ☐ Copies of documents in a waterproof bag
- ☐ Cash in small bills
- ☐ Change of clothes, sturdy shoes and a rain jacket
- ☐ Toothbrush, toothpaste, soap and feminine supplies
- ☐ Glasses and contact lens supplies
- ☐ Whistle and dust mask
- ☐ Comfort item for kids
- ☐ Wallet contact card (Form 3)

Form 10: Car Kit Checklist

See Chapters 5 and 25. The first list is Ready.gov's car kit. The second is from the National Weather Service's winter car kit.

Every car

- ☐ Jumper cables
- ☐ Flares or a reflective triangle
- ☐ Ice scraper
- ☐ Car cell phone charger
- ☐ Blanket
- ☐ Map
- ☐ Cat litter or sand for tire traction

Add for winter

- ☐ Flashlights and extra batteries
- ☐ First aid kit, and essential medicines carried with you
- ☐ Baby gear and any special medical supplies
- ☐ Non-perishable food (canned food and a can opener, dry cereal, nuts, energy bars)
- ☐ Water

- ☐ Basic toolkit (pliers, wrench, screwdriver)
- ☐ Pet food and water
- ☐ Battery-powered or hand-crank radio
- ☐ Shovel
- ☐ Gloves, hat, sturdy boots, jacket and an extra change of cold-weather clothes
- ☐ Body, hand and foot warmers
- ☐ Blankets or sleeping bags
- ☐ Charged cell phone

Form 11: Pet Information

See Chapter 5. One section per pet.

Item	Pet 1	Pet 2
Name and type of animal		
Breed, color and markings		
Microchip number and chip company phone		
Medicines and doses		
Food and feeding schedule		
Veterinarian and phone		
Rabies tag number		
Photo of pet stored where?		

Form 12: Kit Check Log

Check your kits twice a year, when you replace water you bottled yourself, and swap out anything expired.

Date checked	Kit	What I replaced or added	Checked by

Form 13: Before We Leave (Evacuation Checklist)

See Chapter 7. Do only what time allows. If officials say leave now, leave.

- ☐ Leave when officials tell you to, or sooner if you feel unsafe
- ☐ Grab go-bags, medicines and pets (carriers, leashes, pet food)
- ☐ Unplug appliances if you have time
- ☐ Turn off utilities only if officials tell you to
- ☐ Lock doors and windows
- ☐ Tell your out-of-area contact you're leaving and where you're headed
- ☐ Use the routes officials name, not shortcuts
- ☐ Never drive through floodwater

Where we went, and when (leave a copy for your out-of-area contact):

Form 14: After the Disaster: Damage and Claims Log

See Chapter 26. Take photos and video before you clean up or throw anything away, unless something is a safety hazard.

Item	Details
Date of the disaster	
Insurance claim number	
Adjuster name and phone	
FEMA registration number (if you applied)	
Where we're staying now and phone	

Date	Room or item	Damage	Photo taken?	Estimated cost

Date	Who I talked to (company or agency)	What they said or promised

Quick checklist

- ☐ Fill out Forms 1 and 2 this week
- ☐ Make wallet cards for everyone in the house
- ☐ Fill out a medication list for each person
- ☐ Walk the house and fill in the Home Information Sheet
- ☐ Use the kit checklists on your next shopping trip
- ☐ Put copies in your kits and take photos for your phone
- ☐ Set a yearly date to review all of it

Glossary

Advisory. A National Weather Service alert for a hazard that is happening or about to happen but is expected to be a nuisance more than a threat to life.

AED (automated external defibrillator). A portable device that can shock a stopped heart back into a normal rhythm.

Aftershock. A smaller earthquake that follows a larger one in the same area, sometimes for weeks or months.

Air Quality Index (AQI). The EPA's 0-to-500 scale for reporting how clean or polluted the air is.

All clear. The message from local officials that the danger has passed and it's safe to go outside or return home.

Annual percentage rate (APR). The yearly cost of borrowing, including fees, shown as a percent.

Appliance thermometer. A small thermometer kept inside a refrigerator or freezer to show the temperature inside.

Backfeeding. Plugging a generator into a home outlet so power flows backward into the wiring and utility lines, which can kill line workers and start fires.

Bivy sack. A small, light waterproof cover for a sleeping bag or a person, used as emergency shelter.

Boil water advisory. A notice from your water utility or local officials telling you to boil tap water before using it for drinking or cooking.

Bomb threat. A message, often by phone, saying an explosive device has been placed somewhere.

Carbon monoxide (CO). A poison gas with no color or smell, made when fuel burns.

Cardiac arrest. When the heart suddenly stops pumping blood; the person collapses and isn't breathing normally.

CERT. Community Emergency Response Team; a program that trains people in basic disaster response skills.

Civil unrest. Public disorder such as rioting, looting or violent crowds, usually in a limited area.

Cold Weather Advisory. A National Weather Service alert for cold that could be dangerous without care; it replaced the Wind Chill Advisory.

Contagious. Able to pass an illness to other people.

Contamination. Radioactive material that has landed on or gotten inside a person, animal or object, such as dust on clothing or skin.

Cooling center. An air-conditioned public space, often a library, community center or senior center, that a city or county opens so people can escape dangerous heat.

CPR (cardiopulmonary resuscitation). Pushing hard and fast on the chest, sometimes with rescue breaths, to keep blood moving when the heart has stopped.

Curfew. A local order that people stay off public streets during set hours.

Cyberattack. An attempt to break into, damage or shut down computers, networks or connected devices.

Debris flow. A fast-moving flood of mud, rock, and debris, common on land that has recently burned.

Decontamination. Removing a harmful substance from your body, clothing or belongings, usually by taking off outer clothes and washing.

Deductible. The amount you pay on a claim before your insurance starts to pay.

Defensible space. The area around a home that has been cleared of or kept free of things that burn, to slow a wildfire.

Derecho. A very long-lived, damaging thunderstorm with a wind damage path of more than 240 miles.

Dirty bomb. A regular explosive mixed with radioactive material to scatter it over an area; it is not a nuclear explosion.

Disaster Distress Helpline. A toll-free, 24/7 national helpline (1-800-985-5990) for emotional distress related to disasters.

Disaster Recovery Center. An in-person office opened after a disaster where people can learn about FEMA and other aid programs and get help with applications.

Disaster Unemployment Assistance (DUA). Federal benefits for people whose work was lost or interrupted by a presidentially declared major disaster and who cannot get regular unemployment insurance.

Do not drink advisory. A notice telling you not to drink tap water, usually because of chemicals that boiling will not remove.

Do not use advisory. A rare notice telling you not to use tap water for any purpose.

Drop, Cover, and Hold On. The recommended way to protect yourself during an earthquake: get down, protect your head and neck, and hold on until the shaking stops.

Drought. A lack of rain or snow over an extended period, usually a season or more, that leads to a water shortage.

Dry ice. Frozen carbon dioxide, much colder than regular ice, used to keep food frozen; it can burn bare skin.

Dry wash. A normally dry streambed that can flood suddenly from rain falling miles away.

EBT card. Electronic Benefit Transfer card; the plastic card SNAP benefits are loaded onto.

Ember. A small burning piece of wood, bark or leaf carried ahead of a fire by the wind.

Emergency Alert System (EAS). The national warning system that sends emergency alerts over TV and radio stations, cable and satellite.

Emergency fund. Money set aside only for surprise expenses or a loss of income.

Emergency kit. A set of supplies gathered ahead of time to help your household get through an emergency.

Emergency management office. The state, county, or city agency that plans for disasters, sends alerts, and coordinates the response where you live.

Emergency Planning Zone (EPZ). An area around a nuclear power plant, about 10 or 50 miles in radius, where emergency plans are made in advance.

Enhanced Fujita (EF) scale. The U.S. scale, from EF0 to EF5, that rates a tornado by wind speeds estimated from its damage.

Escape plan. A household plan that shows two ways out of every room and an outside meeting place, practiced ahead of time.

Evacuate. To leave an area because officials say it is not safe to stay.

Evacuation. Leaving your home or area to go somewhere safer, often when officials tell you to.

Evacuation order. An instruction from officials for people in a named area to leave.

Evacuation zone. A named area that officials use to tell people who needs to leave.

Extreme Cold Warning. A National Weather Service alert that dangerously cold conditions are expected; it replaced the Wind Chill Warning.

Extreme Heat Warning. An NWS alert, called an Excessive Heat Warning before March 4, 2025, meaning extremely dangerous heat is expected or already happening.

Eye. The roughly circular calm area at the center of a strong tropical cyclone.

Fallout. Radioactive dust and debris that falls back to the ground after a nuclear explosion.

Fault. A crack in the earth's crust where the rock on each side can move.

First in, first out. Using the oldest food first and putting newly bought food behind it.

Flash flood. Fast flooding that generally develops within 6 hours of heavy rain or another cause.

Flood Advisory. An NWS alert that a forecast weather event may cause flooding that becomes a nuisance.

Flood Warning. An NWS alert that flooding is happening or about to happen.

Flood Watch. An NWS alert that conditions are favorable for flooding.

Flood zone. An area on a FEMA flood map, labeled with a letter code, that describes how likely it is to flood.

Food-grade container. A container made of material that is safe for holding food or drinking water.

Freezing rain. Rain that freezes when it hits the ground, trees, or power lines, coating them in ice.

Frostbite. An injury caused by freezing of the skin and tissue, most often on the nose, ears, cheeks, chin, fingers, and toes.

Geomagnetic storm. A disturbance in Earth's magnetic field caused by activity on the sun.

GMRS (General Mobile Radio Service). A two-way radio service that requires an FCC license; one license covers family members.

Go-bag. A small, portable kit you can grab and carry if you have to leave home quickly; also called a grab-and-go bag.

Great ShakeOut. A yearly earthquake drill held each October in most areas.

Hands-only CPR. CPR using chest pushes only, without rescue breaths, for a teen or adult who suddenly collapses.

Hazardous materials (hazmat). Substances that can harm people, animals or the environment if they are spilled, leaked, burned or released.

Heat exhaustion. A heat illness in which the body is overheating and losing too much water and salt; signs include heavy sweating, cool clammy skin and weakness.

Heat index. A number that combines air temperature and humidity to show how hot it actually feels to the human body.

Heat stroke. A medical emergency in which the body can no longer cool itself and its temperature climbs to 103 degrees F or higher; it can cause death or lasting harm.

HEPA. High-efficiency particulate air, a type of filter that traps very fine particles.

Home inventory. A record, such as photos or video, of the things you own, used to support insurance claims.

Hypothermia. A dangerous drop in body temperature that is a medical emergency.

Ice jam. River ice that piles up and blocks the flow of water, causing flooding.

Individual Assistance. FEMA's help for people and households after a declared disaster, including housing help.

Interconnected smoke alarms. Smoke alarms linked by wire or wirelessly so that when one sounds, they all sound.

Isolation. Keeping a sick person away from people who are not sick.

Lahar. A volcanic mudflow: a hot or cold mix of water and rock fragments that flows quickly down a volcano's slopes and through valleys.

Landslide. The movement of rock, earth or debris down a slope.

LIHEAP. The Low Income Home Energy Assistance Program, a federal program run through the states that helps eligible households pay heating and cooling costs.

Local Emergency Planning Committee (LEPC). A local group set up under federal law to plan for chemical accidents and share information about chemicals in the community.

Lockdown. A school or building procedure in which people lock doors and stay hidden inside until it's safe.

Magnitude. A number that describes the size of an earthquake at its source.

Main breaker. The large switch in an electrical panel that turns off power to the whole home.

Major hurricane. A hurricane rated Category 3 or higher.

Maximum sustained wind. The strongest steady wind speed in a storm, used to rate tropical cyclones.

Meeting place. A spot your household agrees on ahead of time to meet if you are separated or can't go home.

Mercaptan. A strong-smelling chemical added to natural gas so people can smell a leak; PHMSA says it smells like a skunk.

MERV. Minimum Efficiency Reporting Value, a rating for how well a furnace or air conditioning filter catches particles.

Microburst. A strong burst of wind coming down out of a thunderstorm and spreading out at the ground.

Micron. A unit of length equal to one-millionth of a meter, used to rate water filter pore size.

Mold. A fungus that grows on damp surfaces and can make people sick, especially those with breathing problems.

Multifactor authentication (MFA). A login that needs a second proof, such as a code sent to your phone, in addition to your password.

Multipurpose fire extinguisher. A dry-chemical extinguisher labeled for the common kinds of home fires, including ordinary materials, flammable liquids, and electrical fires.

N95. A fitted mask that filters out small particles such as mold spores and dust when it seals well to the face.

N95 respirator. A tight-fitting face covering, approved by NIOSH, that filters fine particles from the air when it fits and is worn correctly.

National Flood Insurance Program (NFIP). The federal program that offers flood insurance in participating communities.

National Risk Index. A free online map from the Federal Emergency Management Agency (FEMA) that shows the risk from natural hazards for each U.S. county and Census tract.

NOAA Weather Radio. A radio that receives weather alerts and warnings broadcast by the National Weather Service.

NOAA Weather Radio All Hazards. A network of radio stations run by the National Weather Service that broadcasts warnings and forecasts 24 hours a day.

Non-perishable food. Food that stays safe at room temperature for a long time without refrigeration, such as canned goods and dry cereal.

Out-of-area contact. A friend or relative who lives far away and serves as the person everyone in your household checks in with after a disaster.

Outbreak. More cases of an illness than usual in a particular place or group of people.

Pandemic. A disease outbreak that spreads across several countries and affects a large number of people.

Password manager. A program that creates and stores strong, unique passwords for all your accounts.

Payday loan. A small, short-term, high-cost loan usually due on the borrower's next payday.

Personal locator beacon (PLB). A small handheld device that sends a 406 MHz distress signal with your location to search and rescue through satellites.

Phishing. A fake email, text or call that tries to trick you into giving away passwords, money or personal information.

Pipeline marker. A sign above a buried pipeline that shows the operating company, the product carried and an emergency phone number.

Portable generator. A fuel-burning engine that makes electricity and must be run outdoors, away from the home.

Portable power station. A large rechargeable battery with outlets that makes no fumes and can be used indoors.

Potassium iodide (KI). A non-radioactive iodine pill that can protect only the thyroid from radioactive iodine, taken only when officials say so.

Potential Tropical Cyclone. A disturbance that is not yet a tropical cyclone but could bring tropical storm or hurricane conditions to land within 72 hours.

Power bank. A small rechargeable battery used to charge phones and other small devices.

Public shelter. A safe place opened for people who have left their homes in a disaster.

Quarantine. Staying away from others for a set time after being exposed to an illness, in case you become sick.

Ransomware. Harmful software that locks up a computer system's files until the victim pays the criminals.

Ready-to-feed formula. Liquid infant formula that is ready to pour into a bottle with no mixing or added water.

Ready.gov. The public preparedness website of the Ready Campaign, run by the Federal Emergency Management Agency (FEMA).

Recovery. The weeks and months after a disaster spent returning home, cleaning up, repairing and getting life back to normal.

Red Flag Warning. A National Weather Service alert that warm, very dry and windy weather is raising the risk of fire danger.

Respiratory virus. A virus that infects the nose, throat or lungs, such as those that cause colds and flu.

Retort pouch. A sealed foil food pouch that is shelf-stable, like some tuna and rice packs.

Rolling boil. A hard boil with large bubbles that keeps going even while you stir.

Run, Hide, Fight. The federal public guidance for surviving an attack: get away if you can, hide if you can't, and fight only as a last resort.

Safe room. A room built to protect people from extreme winds such as tornadoes.

Saffir-Simpson Hurricane Wind Scale. A 1-to-5 rating of a hurricane by its maximum sustained wind; it does not measure surge or rain.

SAME (Specific Area Message Encoding). A weather radio feature that lets you choose your county so the alarm sounds only for alerts in your area.

Sanitation. Keeping yourself and your surroundings clean, including handling human waste safely, to stop the spread of germs.

Sanitize. To kill most of the germs on a surface, for example with a weak bleach solution.

Satellite messenger. A handheld device that can send messages and call for help by satellite.

SBA disaster loan. A low-interest loan from the U.S. Small Business Administration to help homeowners, renters and businesses repair or replace what a declared disaster damaged.

Service animal. Under the Americans with Disabilities Act, a dog (or in some cases a miniature horse) trained to do work for a person with a disability; shelters must allow them.

Severe thunderstorm. A storm that can produce hail an inch or larger or winds of 58 mph or stronger.

ShakeAlert. The USGS earthquake early warning system for California, Oregon and Washington.

Shelf life. How long a food stays good to eat in storage.

Shelter in place. Staying inside the building you are in, or going indoors, until officials say it is safe to leave.

Shielding. Heavy, dense material such as concrete, brick or soil placed between you and a radiation source to block it.

Shutoff valve. A valve that stops the flow of water or gas into the home.

SNAP. The Supplemental Nutrition Assistance Program, which helps people with low income buy food.

Sodium hypochlorite. The active ingredient in household chlorine bleach.

Space weather. Conditions on the sun and in space, such as solar flares, that can affect satellites, radio, GPS and power grids on Earth.

Spring pole. A tree or branch bent or trapped under tension that can snap back hard when cut.

Standby generator. A permanently installed generator connected to a home's wiring that starts on its own when the power fails.

STOP. A memory word from the USDA Forest Service for what to do when lost: Stop, Think, Observe, Plan.

Storm surge. An abnormal rise in sea level pushed ashore by a storm, above the normal tide.

Storm tide. The total water rise from storm surge plus the normal tide.

Straight-line winds. Damaging thunderstorm winds that blow in one direction rather than rotating.

Support network. Family, friends, neighbors, and others who agree to help a person, often an older adult or someone with a disability, during an emergency.

Suspicious item. An object that is hidden, obviously suspicious or not typical for the place, and that should be reported and avoided.

Telehealth. Getting health care by phone or video instead of going to a clinic in person.

Ten Essentials. The National Park Service's list of ten kinds of gear to carry outdoors for emergencies.

Tephra. Small rocks and rock shards blown out of a volcano; the tiniest pieces are volcanic ash.

Tetanus. A serious infection caused by germs that can enter the body through cuts and puncture wounds; a vaccine prevents it.

Text-to-911. Sending a text message to 911, available only in some areas.

Tone alert. A radio feature that sounds an alarm when an emergency alert is broadcast.

Tornado. A violently rotating column of air reaching from the base of a thunderstorm to the ground.

Tornado warning. An alert that a tornado has been sighted or indicated by weather radar; take shelter now.

Tornado watch. An alert that tornadoes are possible in and near the watch area.

Tourniquet. A tight band placed around an arm or leg to stop severe bleeding.

Transfer switch. A device installed by an electrician that safely connects a generator to selected home circuits and keeps it separated from utility lines.

Trip plan. A written note left with a trusted person saying where you're going, your route, who is with you, and when you'll be back.

Tropical cyclone. A spinning storm system that forms over warm ocean water; tropical depressions, tropical storms and hurricanes are all tropical cyclones.

Tsunami. A series of extremely long ocean waves, often set off by a large undersea earthquake, that can flood the coast.

Tsunami Advisory. A tsunami alert for strong currents or waves dangerous to people in or very near the water.

Tsunami Warning. The highest tsunami alert level: a tsunami that could cause widespread flooding is imminent, expected or happening.

U.S. Drought Monitor. A national map, updated weekly, that shows where drought is occurring and how intense it is, on a scale from D0 to D4.

Unattended item. An object left behind that shows no signs of being dangerous, such as a forgotten bag.

Unemployment insurance (UI). State-run cash benefits for eligible workers who lose a job through no fault of their own.

Waiting period. The time between buying an insurance policy and the date it takes effect; for NFIP flood policies it is generally 30 days.

Wall cloud. An isolated lowering of the base of a thunderstorm, sometimes seen before a tornado forms.

Warming center. A public place, such as a library or community center, that opens so people can get warm during dangerous cold.

Warning. A National Weather Service alert meaning a dangerous hazard is happening or about to happen; take action now.

Watch. A National Weather Service alert meaning conditions are favorable for a hazard; get ready.

WIC. A nutrition program for pregnant and new mothers, infants, and children under age 5.

Wind chill. How cold people and animals feel outside, based on how fast wind and cold pull heat from exposed skin.

Wireless Emergency Alerts (WEA). Free emergency messages sent by officials to cell phones in an affected area, with a special sound and vibration.

Sources and Further Reading

These are the pages I checked while writing this book, in October 2026, with a few rechecked in November 2026. Web addresses change, so if one stops working, search the agency site for the page title. They are listed by chapter.

Introduction

Cal OES News (April 18, 2023): every county in California offers free emergency alerts; sign up in the county you live, work, or both. https://www.news.caloes.ca.gov/stay-informed-stay-prepared-sign-up-for-emergency-alerts/

FEMA news release (Oct. 9, 2019): FEMA's Ready Campaign launched in 2003 as a national public service campaign; visit Ready.gov. https://www.fema.gov/print/pdf/node/353938

Ready.gov Build a Kit: survive on your own for several days; one gallon per person per day for several days; re-think needs every year. https://www.ready.gov/kit

Ready.gov Water: store in cool, dark place; replace home-filled water every six months. https://www.ready.gov/water

CDC: FDA-approved food-grade water storage containers (verified for Chapter 3). https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html

Chapter 1: Know Your Risks: Hazards Where You Live

FEMA National Risk Index: interactive tool, expected annual losses, social vulnerability, community resilience, county and Census tract levels. https://www.fema.gov/flood-maps/products-tools/national-risk-index

FEMA National Risk Index natural hazards: 18 natural hazards. https://hazards.fema.gov/nri/natural-hazards

FEMA National Risk Index Technical Documentation: names of the 18 natural hazards. https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf

FloodSmart What is My Flood Risk: zones A/V high risk with 1 in 4 chance over 30-year mortgage; B, C, X; 99% of counties in past 20 years; nearly one-third of claims outside high-risk areas (2014-2024). https://www.floodsmart.gov/flood-zones-and-maps/what-is-my-flood-risk

FEMA Region 3 news release (March 27, 2024), Don't Let Spring Flooding Catch You Unprepared: "Anywhere it can rain, it can flood.". https://fema.gov/print/pdf/node/675442

FEMA Flood Map Service Center: official public source for flood hazard information; search by address. https://msc.fema.gov/portal/home

USGS news release, January 2024 National Seismic Hazard Model: nearly 75 percent of U.S.; California, Alaska, Hawaii; Atlantic coast cities; 37 states over magnitude 5. https://www.usgs.gov/news/national-news-release/new-usgs-map-shows-where-damaging-earthquakes-are-most-likely-occur-us

USGS priority faults in the Intermountain West region: states named, high-priority hazardous faults (verified for Chapter 15). https://www.usgs.gov/data/priority-faults-improving-seismic-hazard-models-intermountain-west-region

USGS New Madrid Seismic Zone: four states; 1811-1812 earthquakes magnitude 7 to 8 (verified for Chapter 15). https://www.usgs.gov/programs/earthquake-hazards/new-madrid-seismic-zone

USGS publication: 1886 Charleston, South Carolina, earthquake about magnitude 7 (verified for Chapter 15). https://www.usgs.gov/publications/why-new-madrid-earthquakes-are-m-7-8-and-charleston-earthquake-m-7

Wildfire Risk to Communities FAQ: USDA Forest Service, direction of Congress, community/county/state maps. https://wildfirerisk.org/about/faq/

USGS featured story (Oct. 15, 2020): wildfires across the West increasing; year-round reality; Southwest, Alaska, Great Basin, Montana, California, Pacific Northwest. https://www.usgs.gov/news/featured-story/fire-science-critical-combating-wildfires-out-west

NWS nor'easters: East Coast storms, Washington D.C. to Boston, heavy rain or snow, gale-force winds, coastal flooding. https://www.weather.gov/safety/winter-noreaster

NWS lake effect snow: common across the Great Lakes region in late fall and winter. https://www.weather.gov/safety/winter-lake-effect-snow

NHC storm surge: definition; all East and Gulf coast locations vulnerable; Louisiana and Mississippi particularly vulnerable. https://www.nhc.noaa.gov/surge/

NWS hurricane safety: Atlantic season June 1 to November 30; surge several miles inland; flooding hundreds of miles inland; tornadoes; manufactured homes. https://www.weather.gov/safety/hurricane

NWS Grand Forks blizzard climatology: Red River Valley of the North (eastern North Dakota, northwest and west-central Minnesota) averages 2.6 blizzards per year. https://www.weather.gov/fgf/BlizzardClimatology

NOAA Climate.gov severe weather probability map: April-June peak tornado season; severe weather spreads across the Plains, Midwest, and Southeast. https://www.climate.gov/media/5867

NWS tornado safety: most common in Central Plains and Southeast; reported in all 50 states; any time of day or year. https://www.weather.gov/safety/tornado

NWS Phoenix heat page: heat is the deadliest weather in Arizona. https://www.weather.gov/psr/Heat

NWS Albuquerque monsoon flash floods: monsoon June 15 to September 30; flash floods within six hours; burn areas prone to debris flows at least 2 years. https://www.weather.gov/abq/northamericanmonsoon-flashfloods

NOAA JetStream tsunami locations: hazard high to very high for Alaska, Hawaii, U.S. West Coast; low for Atlantic and Gulf coasts. https://www.noaa.gov/jetstream/tsunamis/tsunami-locations

USGS (Dec. 19, 2018): 161 threatening volcanoes; 18 very high threat in Alaska, California, Hawaii, Oregon, Washington; Kilauea highest. https://www.usgs.gov/news/featured-story/which-us-volcanoes-pose-threat

Hawaii Emergency Management Agency natural hazards brochure: nine hazards. https://dod.hawaii.gov/hiema/files/2022/06/English-Natural-Hazards-Brochure-1.pdf

Ready.gov Home Fires: fire can become life-threatening in about 2 minutes (verified for Chapter 9). https://www.ready.gov/home-fires

NWS Wilmington NC: heat is the #1 weather-related cause of death in the U.S. (verified for Chapter 18). https://weather.gov/ilm/heat

CDC extreme heat: older adults, young children, chronic conditions at high risk (verified for Chapter 18). https://www.cdc.gov/climate-health/php/resources/protect-yourself-from-the-dangers-of-extreme-heat.html

CDC Preparing for a Winter Storm: older adults more susceptible to cold (verified for Chapter 17). https://www.cdc.gov/winter-weather/safety/index.html

PHMSA pipeline markers at street, highway and railway crossings (verified for Chapter 20). https://www.phmsa.dot.gov/safety-awareness/pipeline/pipeline-leak-recognition-and-what-do

EPA Local Emergency Planning Committees: 3,000+ districts, public information, annual plan review, find through SERC (verified for Chapter 20). https://www.epa.gov/epcra/local-emergency-planning-committees

NRC Emergency Planning Zones: 10-mile and 50-mile zones (verified for Chapter 21). https://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones

NWS New York: watch, warning, advisory definitions and lead times. https://www.weather.gov/okx/wwa_definitions

Ready.gov Build a Kit: re-think your needs every year. https://www.ready.gov/kit

NWS Fairbanks, Alaska winter weather hazards brochure: Alaska's winter can be particularly harsh; blizzards, heavy snow, extreme cold, wind chill, coastal flooding and erosion from extreme storms. https://weather.gov/media/afg/WinterWxHazardsBro.pdf

Colorado Planning for Hazards, Severe Winter Storm: severe winter storms frequent throughout Colorado; heavy snows in the high mountains common; several lives lost to avalanches each year. https://planningforhazards.colorado.gov/severe-winter-storm

Chapter 2: Your Family Emergency Plan

Ready.gov family emergency plan form: reconnecting if separated; emergency contacts and meeting places. https://www.ready.gov/plan-form

Indiana Department of Homeland Security, Make a Plan: four steps, out-of-state contact, pets, evacuation route and backup route. https://www.in.gov/dhs/get-prepared/files/make-a-plan.pdf

FCC Tips for Communicating in an Emergency: texting, brief calls, 10 seconds, other services, chargers, contact list, out-of-area contact, corded phone, personal care attendant, medical alert systems. https://www.fcc.gov/reports-research/guides/tips-communicating-emergency

Ready.gov Older Adults: support network, lifesaving equipment, care providers' plans, transportation, assistive devices, kit items, pets and shelters. https://www.ready.gov/older-adults

CDC Sheltering and Evacuating for people with disabilities: health information, medical alert tag, accessible transportation, shelter workers, service animals. https://cdc.gov/disability-emergency-preparedness/people-with-disabilities/sheltering-and-evacuating.html

CDC Be Prepared: Pet Safety in Emergencies: shelters and pets, ID, microchips, buddy system, vet records, pet-friendly hotels, never leave pets behind. https://www.cdc.gov/healthy-pets/emergency-preparedness/index.html

Wisconsin Council on Physical Disabilities (Wisconsin DHS) important documents checklist: IDs, property, insurance, medical, financial, legal, pet and service animal records; copies, flash drive, waterproof container, originals in a safe place. https://dhs.wisconsin.gov/cpd/documents-checklist.pdf

Ready.gov Build a Kit: family documents saved electronically or in a waterproof, portable container (verified for Chapter 5). https://www.ready.gov/kit

Ready.gov Financial Preparedness: storing documents, copies for kit, EFFAK, cash in small bills, photo/video inventory, homeowners insurance and flooding. https://www.ready.gov/financial-preparedness

FloodSmart agent fast facts: homeowners and renters insurance and flooding; participating communities; 22,000 communities; 30-day waiting period. https://agents.floodsmart.gov/articles/13-fast-flood-facts-share-your-clients

FEMA P-2404 Homeowner's Guide to Prepare Financially for Earthquakes (September 2024): standard policies don't cover earthquakes; endorsement or separate policy; deductibles; condos and manufactured homes; Individual Assistance not guaranteed. https://www.fema.gov/sites/default/files/documents/fema_p-2404-homeowners-guide-to-prepare-financially-for-earthquakes.pdf

FEMA NFIP brochure "Why Do I Need Flood Insurance?" (September 2024, F-002): usually a 30-day waiting period with some exceptions (loan closing; flooding caused by wildfire); no coverage for a flood before the policy is effective; can't increase coverage once a flood has begun. https://agents.floodsmart.gov/sites/default/files/media/document/2025-08/FEMA_NFIP_TEXT-ONLY_fema_nfip-why-do-i-need_brochure_20251.pdf

FloodSmart agent article, Understanding Flood Insurance for Renters: renters can buy coverage for personal property; examples; building is owner's responsibility. https://agents.floodsmart.gov/articles/understanding-flood-insurance-renters

Ready.gov Home Fires: practice your fire escape plan twice a year (verified for Chapter 9). https://www.ready.gov/home-fires

CFPB guide to building an emergency fund: definition; small amount helps (verified for Chapter 24). https://www.consumerfinance.gov/an-essential-guide-to-building-an-emergency-fund/

Chapter 3: Water

Ready.gov Water: one gallon per person per day for several days; three quarters of a gallon; needs can double; never ration; carbonated and caffeinated drinks; food-grade containers; replace every six months; store in cool, dark place. https://www.ready.gov/water

Ready.gov Build a Kit: moist towelettes, garbage bags and plastic ties for personal sanitation. https://www.ready.gov/kit

CDC How to Create an Emergency Water Supply: 1 gallon per person per day for 3 days, 2-week supply, containers, cleaning and sanitizing steps, 50-70 F storage, label, replace every six months. https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html

CDC How to Make Water Safe in an Emergency: cloudy water, boiling 1 minute/3 minutes above 6,500 feet, bleach amounts, tablets, filters. https://www.cdc.gov/water-emergency/about/index.html

EPA Emergency Disinfection of Drinking Water: 8 drops of 6% bleach or 6 drops of 8.25% bleach per gallon; double for cloudy, colored or very cold water; let stand 30 minutes. https://www.epa.gov/ground-water-and-drinking-water/emergency-disinfection-drinking-water

CDC How to Find Clean Water in an Emergency: water heater, ice cubes, toilet tank, canned liquids; pools for hygiene only; outdoor sources need treatment; main valve. https://www.cdc.gov/water-emergency/about/how-to-find-clean-water-in-an-emergency.html

Louisiana GOHSEP copy of FEMA/Red Cross/USDA "Food and Water in an Emergency": water heater and pipe draining steps. https://gohsep.la.gov/divisions/hazard-mitigation-assistance/fact-sheet-index/food-plus-water-in-an-emergency

CDC Drinking Water Advisories: An Overview: boil water, do not drink and do not use advisories; appliances on the water line. https://www.cdc.gov/water-emergency/about/drinking-water-advisories-an-overview.html

CDC How to Disinfect Wells After an Emergency: drink bottled water, contact health department, contractor, electrical and well pit warnings, 7-10 days before testing. https://www.cdc.gov/water-emergency/about/how-to-disinfect-wells-after-an-emergency.html

CDC Guidelines for Personal Hygiene During an Emergency: 20-second handwashing, temporary station, 60% alcohol sanitizer and limits, bathing, teeth, wounds. https://www.cdc.gov/water-emergency/safety/guidelines-for-personal-hygiene-during-an-emergency.html

FoodSafety.gov: consider replacing stored bleach each year. https://www.foodsafety.gov/keep-food-safe/food-safety-in-disaster-or-emergency

Washington State Department of Health, Toilet Use During an Emergency: lined toilet bowl or five-gallon bucket, double kitchen garbage bags, kitty litter or peat moss, storing used bags, handwashing. https://doh.wa.gov/community-and-environment/wastewater-management/toilet-use-during-emergencies

Chapter 4: Food

Ready.gov Food: several-day supply, food choices, special diets, formula, 40-140 F, discard rules, damaged cans, cooking outdoors, dry ice handling. https://www.ready.gov/food

Ready.gov Build a Kit: several-day supply of non-perishable food; storage of canned and boxed food; replace expired items; review yearly. https://www.ready.gov/kit

FoodSafety.gov Food Safety in a Disaster or Emergency: 3-day supply, 40-70 F storage, thermometers, coolers, floodwater discards, canned food sanitizing, damaged cans, dry ice, home-canned food. https://www.foodsafety.gov/keep-food-safe/food-safety-in-disaster-or-emergency

FoodSafety.gov: fridge 4 hours, freezer 48/24 hours, discard after 4 hours, refreeze rule, never taste. https://www.foodsafety.gov/blog/three-ways-keep-food-safe-when-you-lose-power

Louisiana GOHSEP copy of FEMA/Red Cross/USDA "Food and Water in an Emergency": two-week stockpile, avoid salty foods. https://gohsep.la.gov/divisions/hazard-mitigation-assistance/fact-sheet-index/food-plus-water-in-an-emergency

CDC Emergency List for Families With Infants and Young Children: ready-to-feed formula safest, checklist items, check monthly. https://www.cdc.gov/infant-feeding-emergencies-toolkit/php/checklist.html

FDA Handling Infant Formula Safely: use the exact amount of water the label says; too much or too little water; do not make homemade formula. https://www.fda.gov/food/buy-store-serve-safe-food/handling-infant-formula-safely-what-you-need-know

CDC Carbon Monoxide Poisoning Basics (checked 2026-11-04): more than 400 deaths a year not linked to fires. https://www.cdc.gov/carbon-monoxide/about/index.html

CDC Avoiding Carbon Monoxide Poisoning: never use fuel-burning devices indoors, garage or carport; more than 400 deaths a year (current CDC basics page); gas oven; grilling. https://www.cdc.gov/natural-disasters/psa-toolkit/avoiding-carbon-monoxide-poisoning.html

CDC Guidelines for Cleaning Safely After a Disaster: never mix bleach with ammonia or any other cleaner; never use bleach in a closed space. https://www.cdc.gov/natural-disasters/safety/index.html

CDC Build a Pet Disaster Preparedness Kit: 2-week supply of food in waterproof containers and 2-week supply of water for each animal. https://www.cdc.gov/healthy-pets/emergency-preparedness/preparedness-kit.html

CDC, How to Create and Store an Emergency Water Supply: two-week supply if possible. https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html

Chapter 5: Emergency Kits: Home, Go-Bag, Car, and Work

Ready.gov Build a Kit: basic kit list, additional items, maintaining the kit, kit locations (home, work 24 hours, car). https://www.ready.gov/kit

Ready.gov Older Adults: medicines, medical supplies, batteries and chargers in kit; assistive devices in evacuation; support network with extra key. https://www.ready.gov/older-adults

Ready.gov Water: replace water you bottled yourself every six months. https://www.ready.gov/water

Ready.gov Car Safety: car kit items, keep gas tank full, mechanic checks, flooded roads, downed power lines. https://www.ready.gov/car

NWS Prepare for Cold Weather: winter car emergency kit list, keep at least half a tank of gas in extreme cold. https://www.weather.gov/safety/cold-before

CDC Emergency List for Families With Infants and Young Children: ready-to-feed formula, feeding supplies, check monthly. https://www.cdc.gov/infant-feeding-emergencies-toolkit/php/checklist.html

CDC Build a Pet Disaster Preparedness Kit: 2-week food, water and medicine supply, records, carrier, ID, sanitation. https://www.cdc.gov/healthy-pets/emergency-preparedness/preparedness-kit.html

Chapter 6: Alerts and Staying in Touch

FCC consumer guide: Wireless Emergency Alerts (free, no sign-up, alert types, block all but Presidential, attention signal, no location tracking). https://www.fcc.gov/sites/default/files/wireless_emergency_alerts_wea.pdf

FCC: Wireless Emergency Alerts and Accessibility (opt-out rules, state and local tests opt-in, sound and vibration). https://www.fcc.gov/wea-accessibility

FCC: Wireless Emergency Alerts (look like text messages, sent through FEMA system, voluntary participation, FEMA/FCC/NWS maintain WEA and EAS). https://www.fcc.gov/public-safety-and-homeland-security/policy-and-licensing-division/alerting/general/wireless

National Weather Service: NOAA Weather Radio (24 hours, more than 1000 transmitters, all 50 states, seven frequencies, special receiver). https://www.weather.gov/nwr/

NWS Philadelphia/Mt. Holly: NOAA Weather Radio FAQ (SAME, 1-888-NWR-SAME, receiver features, 40-mile range, weekly tests, non-weather alerts, strobes and bed shakers). https://www.weather.gov/phi/nwrfaq

NWS New York: Watch, Warning, Advisory and Outlook definitions. https://www.weather.gov/okx/wwa_definitions

FCC: Text to 911 (limited availability, call if you can, bounce-back message, TTY and relay). https://www.fcc.gov/consumers/guides/what-you-need-know-about-text-911

FCC: Tips for Communicating in an Emergency (text, brief calls, wait 10 seconds, batteries and car chargers, corded phone, forward home line, out-of-area contact, register with police). https://www.fcc.gov/reports-research/guides/tips-communicating-emergency

CDC: Carbon Monoxide Poisoning Basics (never run a car in an attached garage). https://www.cdc.gov/carbon-monoxide/about/index.html

FCC: General Mobile Radio Service (license required, 10-year term, 18 or older, family members). https://www.fcc.gov/wireless/bureau-divisions/mobility-division/general-mobile-radio-service-gmrs

FCC: Family Radio Service (licensed by rule, any age, range, shared with GMRS). https://www.fcc.gov/wireless/bureau-divisions/mobility-division/family-radio-service-frs

FCC: Amateur radio examinations (exam by volunteer examiners, Technician class). https://www.fcc.gov/wireless/bureau-divisions/mobility-division/amateur-radio-service/examinations

FCC consumer guide: Emergency Alert System (national warning system; President, NWS, state and local use; broadcasters, cable, satellite). https://www.fcc.gov/sites/default/files/emergency_alert_system_eas.pdf

FCC: Personal Service and Amateur Application Fees ($35 for a new GMRS or amateur license, effective March 2, 2023). https://www.fcc.gov/personal-service-and-amateur-application-fees

Chapter 7: Shelter in Place or Evacuate

NWS: What to do before a hurricane (find out if you live in a hurricane evacuation area through local government or emergency management). https://www.weather.gov/safety/hurricane-plan?pg=2

American Red Cross: Power Outage Safety (keep your car gas tank at least half full). https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/power-outage.html

NWS Nashville: flood depth facts and Turn Around Don't Drown. https://www.weather.gov/ohx/flooding

American Red Cross: Find an open shelter (shelter map, what shelters provide, what to bring and not bring, service animals, pets, accessibility, no ID needed). https://www.redcross.org/get-help/disaster-relief-and-recovery-services/find-an-open-shelter.html

NWS: Tornado safety during (basement, safe room, interior room; mobile homes not safe; vehicles; schools and workplaces). https://www.weather.gov/safety/tornado-during

CDC: What to Do to Shelter in Place for a Chemical Emergency, last reviewed June 17, 2026 (room choice, sealing, duration, all clear, vehicles, pets). https://www.cdc.gov/chemical-emergencies/response/shelter-in-place.html

CDC: What to Do: Get Inside (best shelter, outer clothing, pets, at least 24 hours). https://www.cdc.gov/radiation-emergencies/response/get-inside.html

CDC: Radiation Emergencies (Get Inside, Stay Inside, Stay Tuned). https://www.cdc.gov/radiation-emergencies/index.html

NWS: After the hurricane (return only when officials say safe, check outside, when to stay out, flashlights not candles, CO a leading cause of death). https://www.weather.gov/safety/hurricane-after

CDC: Carbon Monoxide Poisoning Basics, last reviewed October 26, 2026 (never use a generator in a home or garage). https://www.cdc.gov/carbon-monoxide/about/index.html

CDC: Use a generator safely (outside only, at least 20 feet from doors, windows and vents). https://www.cdc.gov/natural-disasters/psa-toolkit/use-a-generator-safely.html

FCC: Tips for Communicating in an Emergency (people with disabilities register with local police). https://www.fcc.gov/reports-research/guides/tips-communicating-emergency

Chapter 8: First Aid and Staying Healthy

MedlinePlus, Choking - adult or child over 1 year (checked 2026-11-04): signs, when to call 911, back blows and abdominal thrusts, chest thrusts for pregnant or obese people, CPR if unconscious. https://medlineplus.gov/ency/article/000049.htm

American Red Cross Scientific Advisory Council, Burn Cooling advisory (checked 2026-11-04): cool for a minimum of 10 minutes, ideally 20. https://www.redcross.org/content/dam/redcross/docs/Burn%20Cooling%E2%80%94ADVISORY.pdf

American Heart Association, How to Perform CPR (checked 2026-11-04): repeat until additional help or the AED arrives; use an AED. https://www.heart.org/-/media/Files/Nation-of-Lifesavers/How-to-Perform-CPR-Infographic.pdf

American Red Cross: Anatomy of a First Aid Kit (family of four contents, where to keep kits, checking kits, personal items). https://www.redcross.org/get-help/how-to-prepare-for-emergencies/anatomy-of-a-first-aid-kit.html

American Heart Association: What is CPR (Hands-Only CPR steps, 100 to 120 a minute, at least 2 inches deep for an average adult, CPR can double or triple survival; page copyright 2026). https://cpr.heart.org/en/resources/what-is-cpr

American Heart Association: 11 things to know to save a life with CPR (heel of hand in center of chest, Stayin' Alive tempo, more than 70% at home, biggest risk is not doing something, rescue breaths for children, AEDs used quickly). https://www.heart.org/en/news/2023/02/01/11-things-to-know-to-save-a-life-with-cpr

Stop the Bleed handout: three ways to control bleeding, always alert emergency services. https://www.stopthebleed.org/media/plpjtq5p/25_tr_stb_handout_4x6_acslogo.pdf

MedlinePlus: Burns (first aid, do nots, when to call 911). https://medlineplus.gov/ency/article/000030.htm

CDC: Carbon Monoxide Poisoning Basics, last reviewed October 26, 2026 (symptoms, higher-risk groups, prevention). https://www.cdc.gov/carbon-monoxide/about/index.html

CDC: Use a generator safely (outside only, at least 20 feet from doors, windows and vents). https://www.cdc.gov/natural-disasters/psa-toolkit/use-a-generator-safely.html

CPSC: Carbon Monoxide Questions and Answers (if the alarm sounds: do not look for the source, move outside, call 911, do not reenter until responders allow; tell your doctor). https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Carbon-Monoxide-Information-Center/Carbon-Monoxide-Questions-and-Answers

HRSA Poison Help: Calling Poison Help (1-800-222-1222). https://poisonhelp.hrsa.gov/faq/calling-poison-help

HRSA Poison Help overview brochure (free service connecting to local poison control centers; nurse, pharmacist or poison expert answers; when to call 911). https://poisonhelp.hrsa.gov/sites/default/files/poisonhelp/resources/brochure_poison-help-overview.pdf

FDA: Safe Drug Use After a Natural Disaster. https://www.fda.gov/drugs/emergency-preparedness-drugs/safe-drug-use-after-natural-disaster

FDA: Insulin storage and switching between products in an emergency (59 to 86 degrees F, 28 days). https://www.fda.gov/drugs/emergency-preparedness-drugs/information-regarding-insulin-storage-and-switching-between-products-emergency

CDC: Floodwater safety (wound care, tetanus booster, handwashing, protective gear). https://www.cdc.gov/floods/safety/floodwater-after-a-disaster-or-emergency-safety.html

SAMHSA: Disaster Distress Helpline (call or text 1-800-985-5990, 24/7, multilingual). https://www.samhsa.gov/find-help/helplines/disaster-distress-helpline

CDC: Coping with a Disaster or Traumatic Event (common reactions, healthy ways to cope, when to get help). https://www.cdc.gov/natural-disasters/media/pdfs/2024/08/coping_with_disaster_2_english.pdf

CDC: Helping Children Cope with a Disaster, last reviewed January 12, 2026 (reactions by age, what parents can do, when to seek help: two to four weeks). https://www.cdc.gov/children-and-school-preparedness/before-during-after/helping-children-cope.html

988 Suicide and Crisis Lifeline (call, text, chat; 24/7/365; free and confidential). https://988lifeline.org/

Chapter 9: Home Safety: Utilities, Fire, and Carbon Monoxide

Earthquake Country Alliance Gas Safety: shut off only if you smell gas, hear it escaping, or suspect a broken pipe; wrench readily available; only utility personnel or qualified plumbers restore service; delays after a disaster. https://www.earthquakecountry.org/step1/gassafety/

CDC Protect Yourself from Electrical Hazards: never turn power on or off while standing in water; don't enter standing water to reach main switch; electrician inspection after flooding. https://www.cdc.gov/natural-disasters/response/what-to-do-protect-yourself-from-electrical-hazards.html

Adams County (CO) Office of Emergency Management, Household Utilities in a Disaster: smell gas/hissing get out, outside main valve, call from neighbor's, qualified professional must turn gas back on, water main location, circuits before main. https://adamscountyco.gov/our-county/office-of-emergency-management/be-prepared/household-utilities-in-a-disaster/

Ready.gov Home Fires: smoke alarm batteries, every level, 10-year replacement, escape plan habits, fire speed, candles 12 inches, grills 10 feet, heaters 3 feet, chimneys, trapped, stop drop roll. https://www.ready.gov/home-fires

USFA smoke alarm infographic: placement, interconnection, half of deaths 11 p.m. to 7 a.m., monthly testing, 10-year replacement, waking children and older adults, get out and stay out. https://www.usfa.fema.gov/downloads/pdf/publications/smoke-alarm-infographic.pdf

USFA Heating Fire Safety handout: 3 feet, heaters off at bedtime, fireplace screen, ashes in lidded metal container outside at least 10 feet from home, chimney inspected and cleaned yearly, furnace inspected yearly, kerosene refuel cooled heater outside. https://www.usfa.fema.gov/downloads/pdf/publications/heating-fire-safety-handout.pdf

USFA heater fire safety card: listed heaters, tip-over shutoff, 3 feet, wall outlet, kerosene refueling. https://www.usfa.fema.gov/downloads/pdf/publications/heater_fire_safety_card.pdf

USFA Choosing and Using Fire Extinguishers: classes, multipurpose A-B-C, placement, maintenance, PASS, when to fight or leave. https://www.usfa.fema.gov/prevention/home-fires/prepare-for-fire/fire-extinguishers/

CDC Carbon Monoxide Poisoning basics: symptoms, who is at risk, detectors, generators, charcoal, cars in garages. https://www.cdc.gov/carbon-monoxide/about/index.html

CPSC news release, Feb 19, 2026: generators never in home, garage, basement, crawlspace, shed; not porch or carport; 20 feet; CO alarms; heaters; candles; charcoal; smell gas. https://www.cpsc.gov/Newsroom/News-Releases/2026/Winter-Storm-May-Knock-Out-Power-CPSC-Warns-of-Deadly-Carbon-Monoxide-and-Fire-Risks

CDC Preparing for a Winter Storm: multipurpose dry-chemical extinguisher, furnace check, chimney inspection, smoke and CO alarm near heated area. https://www.cdc.gov/winter-weather/safety/index.html

CPSC Portable Generator Hazards sheet: flammable liquids stored outside living areas in properly-labeled, non-glass safety containers. https://www.cpsc.gov/s3fs-public/portable-generator-hazards-047.pdf?VersionId=x3BUmW15gAWj.37AWHQXjSpke0wcunX7

Ready.gov Power Outage info sheet: never use a gas stovetop, oven, grill or dryer to heat your home. https://www.ready.gov/sites/default/files/2024-03/ready.gov_power-outage_hazard-info-sheet.pdf

CDC During and After a Winter Storm: generators, grills and camp stoves never indoors; fireplaces vented; heaters 3 feet. https://www.cdc.gov/winter-weather/safety/stay-safe-during-after-a-winter-storm-safety.html

Chapter 10: Power Outages

CPSC news release, Feb 19, 2026: generators never in home, garage, basement, crawlspace, shed; not porch or carport; 20 feet; CO alarms; heaters; candles; charcoal; smell gas. https://www.cpsc.gov/Newsroom/News-Releases/2026/Winter-Storm-May-Knock-Out-Power-CPSC-Warns-of-Deadly-Carbon-Monoxide-and-Fire-Risks

CPSC Portable Generator Hazards sheet: never backfeed into wall outlet, outdoor heavy-duty cords, refuel when off and cool, never store fuel in home, canopy and dry hands, never in homes, garages, basements, crawlspaces, sheds. https://www.cpsc.gov/s3fs-public/portable-generator-hazards-047.pdf?VersionId=x3BUmW15gAWj.37AWHQXjSpke0wcunX7

American Red Cross Generator Safety: electrician-installed power transfer switch; backfeeding risks utility workers, neighbors, household; never plug into wall outlet; outdoor-rated cords; turn off and cool before refueling; fuel in approved safety can outside living areas. https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/power-outage/safe-generator-use.html

CDC Protect Yourself from Electrical Hazards: approved automatic-interrupt devices; fire hazard and line workers when power returns; never touch a fallen line; line on car; standing water. https://www.cdc.gov/natural-disasters/response/what-to-do-protect-yourself-from-electrical-hazards.html

CDC Use a Generator Safely: keep it outside at least 20 feet from doors, windows, vents. https://www.cdc.gov/natural-disasters/psa-toolkit/use-a-generator-safely.html

CDC Carbon Monoxide Poisoning basics: never use a generator inside home or garage even if doors and windows are open; CO detectors near sleeping areas; never run a car in an attached garage. https://www.cdc.gov/carbon-monoxide/about/index.html

CDC During and After a Winter Storm: never run generators, grills, or camp stoves indoors or in enclosed spaces. https://www.cdc.gov/winter-weather/safety/stay-safe-during-after-a-winter-storm-safety.html

FoodSafety.gov: 4 hours fridge, 48 and 24 hours freezer, 4-hour discard rule, refreezing, never taste. https://www.foodsafety.gov/blog/three-ways-keep-food-safe-when-you-lose-power

Ready.gov Be Prepared for a Power Outage (FEMA V-1008, Dec 2023): supplies for several days, medical devices, prioritize, alarms, thermometer, charging, 4 and 48 hours, 20 feet, never heat with stove/oven/grill/dryer, unplug, check neighbors, 40 F over 4 hours, medications. https://www.ready.gov/sites/default/files/2024-03/ready.gov_power-outage_hazard-info-sheet.pdf

American Red Cross Power Outage Safety: stay at least 35 feet from fallen lines and anything they touch, call 911; gas tank at least half full; medical device plan with providers. https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/power-outage.html

California Public Utilities Commission Power Outage Resources: utilities may initiate a public safety power shutoff (PSPS) due to increased risks of wildfire ignitions under certain weather and landscape conditions. https://www.cpuc.ca.gov/about-cpuc/divisions/safety-policy-division/emergency-management/power-outage-resources

Illinois Emergency Management Agency Downed Power Lines fact sheet: assume live, 30 feet, water, call 911, stay in vehicle. https://ready.illinois.gov/content/dam/soi/en/web/ready/plan/documents/DownedPowerLines_Factsheet.pdf

Ready.gov Build a Kit: several-day supply of water and food. https://www.ready.gov/kit

Chapter 11: Hurricanes

NHC Saffir-Simpson Hurricane Wind Scale: categories, wind ranges, damage, scale does not cover surge or rain. https://www.nhc.noaa.gov/aboutsshws.php

NHC glossary: storm classes, watches and warnings, eye, Potential Tropical Cyclone, season dates. https://www.nhc.noaa.gov/aboutgloss.shtml

NHC hurricane hazards: surge, rainfall, wind, tornadoes, rip currents. https://www.nhc.noaa.gov/prepare/hazards.php

NHC storm surge overview: definitions, leading cause of deaths, weight of water, inland reach. https://www.nhc.noaa.gov/surge/

NHC FAQ on Extreme Wind Warning and Storm Surge Watch/Warning: 115 mph sustained, only with major hurricanes. https://www.nhc.noaa.gov/easfaq/

NWS Florida offices, Florida Tropical Training Week 2025: "Run from the water" (storm surge) and "Hide from the wind". https://www.weather.gov/media/jax/pdf/Day3_HunkerDown_2025(1).pdf

NWS Newport/Morehead City hurricane preparedness: interior room, evacuation, Know Your Zone, mobile homes, deaths after the storm, Extreme Wind Warning. https://www.weather.gov/mhx/hurricaneprep

NOAA preparedness steps: evacuation plan, insurance, home strengthening, season dates. https://www.noaa.gov/prepare-before-hurricane-season

CDC hurricane key messages: supplies, evacuation, CO, generator, floodwater, mold, food and water, heat. https://www.cdc.gov/hurricanes/media/pdfs/338199-A_NCEH_PUB_HurricaneKeyMsgs-English-508.pdf

CDC Stay Safe After a Hurricane: building inspection before reentry, tap water, food. https://www.cdc.gov/natural-disasters/psa-toolkit/hurricane-preparedness.html

CDC Reentering Your Flooded Home: never run gasoline engines inside a home, basement or garage, or less than 20 feet from openings even if open. https://www.cdc.gov/floods/safety/reentering-your-flooded-home-safety.html

Ready.gov floods: attic and roof advice, homeowners policies and flooding, FEMA assistance number. https://www.ready.gov/floods

CDC Guidelines for Cleaning Safely After a Disaster: never mix bleach with ammonia or any other cleaner; never use bleach in a closed space; throw away what cannot be cleaned and dried quickly. https://www.cdc.gov/natural-disasters/safety/index.html

Hawaii Emergency Management Agency (2017 release): minimum of 14 days of food, water and other supplies; restoration likely 2 weeks or longer; know inundation and flood zones. https://dod.hawaii.gov/hiema/prepare-for-hurricane-season/

FloodSmart: landlord insurance won't protect renters' belongings; renters insurance typically excludes flood. https://agents.floodsmart.gov/articles/what-renters-dont-know-about-flood-insurance-coverage

Ready.gov kit: one gallon per person per day for several days. https://www.ready.gov/kit

CDC generator safety: 20 feet, never indoors. https://www.cdc.gov/natural-disasters/psa-toolkit/use-a-generator-safely.html

Chapter 12: Tornadoes and Severe Thunderstorms

FEMA Residential Safe Rooms fact sheet: designed to resist wind pressures and wind-borne debris; near-absolute protection; inside, adjacent or detached. https://www.fema.gov/sites/default/files/2020-07/residential-safe-room-fact-sheet.pdf

NWS Tornado Safety: definition, reported in all 50 states, any time of day or year. https://www.weather.gov/safety/tornado

NWS What to do During a Tornado: shelter by location, vehicles, mobile homes, schools. https://www.weather.gov/safety/tornado-during

NWS Tornado Safety one-pager: watch and warning meanings, safe room, drills, after the storm. https://www.weather.gov/media/owlie/TornadoSafety-OnePager-2-27-19.pdf

NWS Norman EF scale: 3-second gust ranges EF0 to EF5, estimates based on damage, operational February 1, 2007. https://www.weather.gov/oun/efscale

NWS Milwaukee/Sullivan: EF scale wind ranges, adopted 2007, signs of a tornado, overpasses. https://www.weather.gov/mkx/taw-tornado_classification_safety

NWS Severe Thunderstorm Watch vs. Warning: meanings, area covered, take shelter in a substantial building, get out of mobile homes. https://www.weather.gov/safety/thunderstorm-ww

NWS Severe Thunderstorm Safety: severe criteria, hail, damaging winds. https://www.weather.gov/safety/thunderstorm

NWS Birmingham: storm-based warnings 30 to 60 minutes, straight-line winds, microbursts, hail. https://www.weather.gov/bmx/outreach_svr

NWS Thunderstorm Winds and Derechos: derecho criteria (more than 240 miles, gusts at least 58 mph), straight-line winds have no rotation. https://www.weather.gov/safety/wind-thunderstorms-derecho

NWS Lightning Safety overview: When Thunder Roars Go Indoors, 30-minute rule, indoor safety, victims safe to touch. https://www.weather.gov/safety/lightning-safety-overview

NWS During a Severe Thunderstorm: secure location, avoid big rooms, sheds and trees unsafe, vehicles. https://www.weather.gov/safety/thunderstorm-during

CDC Reentering Your Flooded Home: if you smell gas, leave and notify the gas company, police or fire department. https://www.cdc.gov/floods/safety/reentering-your-flooded-home-safety.html

CDC generator safety: 20 feet from doors, windows and vents. https://www.cdc.gov/natural-disasters/psa-toolkit/use-a-generator-safely.html

Chapter 13: Floods

FloodSmart: most common and costly natural disaster, 30-day waiting period, homeowners/renters policies, disaster declaration. https://agents.floodsmart.gov/articles/13-fast-flood-facts-share-your-clients

FloodSmart: 99% of counties, one-third of claims outside high-risk areas, building and belongings. https://www.floodsmart.gov/get-flood-insurance

FloodSmart: landlord insurance does not protect renters' belongings; renters insurance typically excludes flood; contents-only coverage up to $100,000. https://agents.floodsmart.gov/articles/what-renters-dont-know-about-flood-insurance-coverage

NWS Flood Safety: coast-to-coast threat nearly every day, interactive flood map. https://www.weather.gov/safety/flood

NWS types of flooding: flash, river, coastal, inland, burn scars, ice jams, snowmelt, dry wash, dams. https://www.weather.gov/safety/flood-hazards

NWS flood alerts: advisory, watch, warning, flash flood warning. https://www.weather.gov/safety/flood-watch-warning

NWS Turn Around Don't Drown: over half of drownings in vehicles, collapsed roads, barriers. https://www.weather.gov/safety/flood-turn-around-dont-drown

NWS Nashville: 6, 12 and 18 to 24 inches of moving water. https://www.weather.gov/ohx/flooding

Ready.gov Floods: before, during, after; car and attic advice; cleanup; FEMA number. https://www.ready.gov/floods

CDC reentering a flooded home: inspection, gas, electricity, CO 20 feet, mold drying, wells. https://www.cdc.gov/floods/safety/reentering-your-flooded-home-safety.html

CDC hurricane key messages: floodwater and wounds, cleanup gear, bleach ratio, N95. https://www.cdc.gov/hurricanes/media/pdfs/338199-A_NCEH_PUB_HurricaneKeyMsgs-English-508.pdf

CDC Guidelines for Cleaning Safely After a Disaster: never mix bleach with ammonia or any other cleaner; never use bleach in a closed space; dry within 24 to 48 hours; throw away what cannot be cleaned and dried quickly. https://www.cdc.gov/natural-disasters/safety/index.html

Ready.gov kit: one gallon per person per day for several days. https://www.ready.gov/kit

Chapter 14: Wildfires and Smoke

AirNow, Air Quality Index (AQI) Basics: categories, colors and values. https://www.airnow.gov/aqi/aqi-basics/

EPA, Reduce Your Smoke Exposure: indoor air, MERV 13, air cleaners, respirators, cars. https://www.epa.gov/wildfires/reduce-your-smoke-exposure

EPA, Prepare for Wildfire Smoke: N95s, cleaner air room, DIY air cleaner, stocking up. https://www.epa.gov/wildfires/prepare-wildfire-smoke

EPA, DIY Air Cleaners: fan age and safety marking, extension cords, children, smoke alarms, MERV 13. https://www.epa.gov/emergencies-iaq/diy-air-cleaners

CDC, Safety Guidelines: Wildfires and Wildfire Smoke. https://www.cdc.gov/wildfires/safety/how-to-safely-stay-safe-during-a-wildfire.html

CAL FIRE, Defensible Space zones. https://www.fire.ca.gov/dspace

USFA, Protecting structures from wildfire embers: ember ignitions, metal screens, sealing openings. https://www.usfa.fema.gov/blog/protecting-structures-from-wildfire-embers-and-fire-exposures/

NWS Marquette, Red Flag Warning definition and fire safety tips. https://www.weather.gov/mqt/redflagtips

NWS, Wildfire safety messages: Fire Weather Watch and Red Flag Warning, leave immediately when asked. https://www.weather.gov/wrn/wildfire-sm

NWS, Wildfire preparedness tips. https://www.weather.gov/safety/wildfire-ready

IAFC, Ready, Set, Go! personal wildfire action guide. https://www.iafc.org/topics-and-tools/resources/resource/rsg-action-guide

EPA, Protect Yourself from Ash. https://www.epa.gov/wildfires/protect-yourself-ash

AirNow, After a Fire: cleanup hazards, children, filters. https://www.airnow.gov/wildfires/after-a-fire/

USGS, Postfire debris-flow hazards. https://www.usgs.gov/programs/landslide-hazards/science/postfire-debris-flow-hazards

Chapter 15: Earthquakes

USGS, New map shows where damaging earthquakes are most likely (Jan. 16, 2024). https://www.usgs.gov/news/national-news-release/new-usgs-map-shows-where-damaging-earthquakes-are-most-likely-occur-us

USGS, Priority faults in the Intermountain West region (states named). https://www.usgs.gov/data/priority-faults-improving-seismic-hazard-models-intermountain-west-region

USGS, The New Madrid Seismic Zone. https://www.usgs.gov/programs/earthquake-hazards/new-madrid-seismic-zone

USGS publication (Cramer and Boyd, 2014): 1886 Charleston earthquake about M 7.0. https://www.usgs.gov/publications/why-new-madrid-earthquakes-are-m-7-8-and-charleston-earthquake-m-7

FEMA B-526, Earthquake Safety Checklist (October 2023). https://www.fema.gov/sites/default/files/documents/fema_b-526-eq-safety-checklist.pdf

Earthquake Country Alliance, How to protect yourself during an earthquake. https://www.earthquakecountry.org/dropcoverholdon/

Earthquake Country Alliance, Step 5: Drop, Cover, and Hold On. https://www.earthquakecountry.org/step5/

Great ShakeOut, Drop, Cover, and Hold On: wheelchair, walker and cane guidance. https://www.shakeout.org/dropcoverholdon/

USGS, How do I sign up for ShakeAlert?. https://www.usgs.gov/faqs/how-do-i-sign-shakealertr-earthquake-early-warning-system

Chapter 16: Tsunamis, Volcanoes, and Landslides

U.S. Tsunami Warning Centers, message definitions. https://www.tsunami.gov/?page=message_definitions

NWS, Tsunami hazards by region and wave speed. https://www.weather.gov/safety/tsunami-hazards

NWS, Tsunami preparedness messages: natural warning signs and evacuation. https://www.weather.gov/wrn/tsunami-sm

Earthquake Country Alliance, Step 5: protect yourself; at the shore. https://www.earthquakecountry.org/step5/

FEMA B-526, Earthquake Safety Checklist: tsunami warning. https://www.fema.gov/sites/default/files/documents/fema_b-526-eq-safety-checklist.pdf

USGS, About Volcanoes: number and location of U.S. volcanoes, ash. https://www.usgs.gov/programs/VHP/about-volcanoes

USGS, EarthWord: Lahar (definition, speed, distance). https://www.usgs.gov/news/earthword-lahar

CDC, Safety Guidelines: During a Volcanic Eruption. https://www.cdc.gov/volcanoes/safety/protecting-yourself-during-a-volcanic-eruption-safety.html

CDC, Safety Guidelines: After a Volcanic Eruption. https://www.cdc.gov/volcanoes/safety/protect-yourself-during-a-volcanic-eruption-safety.html

USGS, Signs of landslide development and what to do. https://www.usgs.gov/programs/landslide-hazards/what-are-signs-landslide-development-what-do-i-do-if-a-landslide-occurs

USGS, Postfire debris-flow hazards. https://www.usgs.gov/programs/landslide-hazards/science/postfire-debris-flow-hazards

Chapter 17: Winter Storms and Extreme Cold

NWS Winter Weather Warnings, Watches and Advisories: definitions and blizzard/ice storm criteria (page still lists old Wind Chill products). https://www.weather.gov/safety/winter-ww

NWS Understanding Cold Weather Alerts: Extreme Cold Watch/Warning, Cold Weather Advisory, Freeze Watch/Warning meanings. https://www.weather.gov/safety/cold-ww

NWS New Orleans/Baton Rouge cold weather product changes: took effect October 1, 2024, nationwide; Wind Chill products replaced by Extreme Cold products; Hard Freeze Warning removed; thresholds based on local climatology. https://www.weather.gov/lix/ColdWeatherChange2024

NWS cold hazard simplification: Wind Chill products renamed Extreme Cold Watch/Warning and Cold Weather Advisory; Hard Freeze products consolidated. https://www.weather.gov/news/243009-cold-hazard-simplification

NWS Wind Chill Chart: definition; 0 F with 15 mph = -19 F; frostbite in 30 minutes; 50 F and 3 mph limits; frostbite needs air temperature below freezing. https://www.weather.gov/safety/cold-wind-chill-chart

American Red Cross Preventing and Thawing Frozen Pipes: hoses, outdoor valves, cabinets, drip, same temperature day and night, 55 F when away, thawing methods, no open flame, call plumber. https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/winter-storm/frozen-pipes.html

CDC Hypothermia: signs in adults and infants; below 95 F; what to do; can occur above 40 F. https://www.cdc.gov/winter-weather/prevention/index.html

CDC Preventing Frostbite: body parts, signs, what to do and not do. https://www.cdc.gov/winter-weather/prevention/preventing-frostbite.html

CDC Preparing for a Winter Storm: insulate water lines, chimney, furnace, alarms, extinguisher, car kit, gas tank near full, pets, older adults, thermometer. https://www.cdc.gov/winter-weather/safety/index.html

CDC During and After a Winter Storm: stay indoors, 3 feet, venting, CO, shoveling, ice, driving, 10 minutes per hour, exhaust pipe, layers. https://www.cdc.gov/winter-weather/safety/stay-safe-during-after-a-winter-storm-safety.html

CPSC news release, Feb 19, 2026: generators never in home, garage, basement, crawlspace, shed; not porch or carport; 20 feet; CO alarms; heaters; candles; charcoal; smell gas. https://www.cpsc.gov/Newsroom/News-Releases/2026/Winter-Storm-May-Knock-Out-Power-CPSC-Warns-of-Deadly-Carbon-Monoxide-and-Fire-Risks

CDC Carbon Monoxide basics: generator never inside home or garage; more than 20 feet. https://www.cdc.gov/carbon-monoxide/about/index.html

Chapter 18: Extreme Heat and Drought

NWS Wilmington NC heat page: heat is the #1 weather-related cause of death in the U.S.; local Heat Advisory and Extreme Heat Watch/Warning heat index criteria. https://weather.gov/ilm/heat

Ready.gov Extreme Heat: definition, at-risk groups, fans, cooling centers, home cooling steps, LIHEAP, never leave people or pets in a closed car, during steps, pets, heat illness signs and first aid. https://www.ready.gov/heat

NWS Heat Watch vs. Warning: official meanings of Extreme Heat Warning, Extreme Heat Watch and Heat Advisory. https://www.weather.gov/safety/heat-ww

NWS news: Excessive Heat Watch/Warning renamed Extreme Heat Watch/Warning on March 4, 2025. https://www.weather.gov/news/250310-heat-hazard

NWS heat illness page: heat stroke and heat exhaustion signs and first aid; fan caution when heat index is in the high 90s. https://weather.gov/safety/heat-illness

CDC Heat-Related Illnesses poster: what to look for and what to do for heat stroke, heat exhaustion, heat cramps, sunburn and heat rash. https://www.cdc.gov/disasters/extremeheat/pdf/Heat_Related_Illness.pdf

NWS Children, Pets and Vehicles: car reached 94.3 F in just over 2 minutes; windows slightly open do not significantly decrease heating; lock cars even in your driveway. https://www.weather.gov/safety/heat-children-pets

NHTSA Child Heatstroke Prevention: check the back seat before locking, personal item in back seat, child care call, lock car and keep keys and fobs away, call 911. https://www.nhtsa.gov/campaign/heatstroke

NIOSH Workplace Recommendations: 1 cup every 15-20 minutes for moderate work under 2 hours, no more than 6 cups per hour, electrolytes after hours of sweating, rest breaks, acclimatize over 7 to 14 days, buddy system. https://www.cdc.gov/niosh/heat-stress/recommendations/index.html

CDC NIOSH heat-related illnesses: heat stroke temperature rise in 10 to 15 minutes; cooling head, neck, armpits and groin. https://www.cdc.gov/niosh/heat-stress/about/illnesses.html

CDC Protect Yourself From the Dangers of Extreme Heat: high-risk groups, drink fluids even if not thirsty, never leave children or pets in cars, check on elderly neighbors. https://www.cdc.gov/climate-health/php/resources/protect-yourself-from-the-dangers-of-extreme-heat.html

CDC Older Adults and Extreme Heat: why older adults are at higher risk. https://www.cdc.gov/aging/emergency-preparedness/older-adults-extreme-heat/

NWS HeatRisk page: levels 0 to 4 (green, yellow, orange, red, magenta), seven-day forecast, supplementary to official alerts, labeled experimental. https://www.wpc.ncep.noaa.gov/heatrisk/

Drought.gov Current Conditions: U.S. Drought Monitor, D0 to D4 categories, maps released every Thursday morning, definition of drought. https://www.drought.gov/current-conditions

CDC Health Impacts of Drought: private well users at higher risk of drought-related infectious disease, rising food prices, conservation should not get in the way of sanitation and hygiene, low-flow aerators. https://www.cdc.gov/drought-health/health-implications/index.html

Chapter 19: Pandemics and Disease Outbreaks

Ready.gov Pandemic: definition, how disease spreads, before/during/after steps, supplies for several days or weeks, buy gradually, telemedicine, documents and scams, 20-second handwashing, 60 percent alcohol sanitizer, masks in public, six feet, clean high-touch surfaces, exposure, 911, accurate information, stigma, mental health. https://www.ready.gov/pandemic

CDC Caring for Someone Sick (flu), last reviewed March 22, 2024: minimize contact and avoid face-to-face, masks as added layer, fresh outside air, wash hands after touching the sick person or their tissues or laundry, clean and disinfect, rest, emergency warning signs. https://www.cdc.gov/flu/takingcare/caring-for-someone.html

CDC Preventing Spread of Respiratory Viruses When You're Sick (Aug. 18, 2025): stay home and away from others, 24-hour return rule, 5 days of added precautions, masks when sick at home, emergency warning signs. https://www.cdc.gov/respiratory-viruses/prevention/precautions-when-sick.html

Chapter 20: Chemical and Hazardous Materials Accidents

CDC What to Do to Shelter in Place for a Chemical Emergency (last reviewed June 17, 2026): safe room choice, sealing kit with 2-4 mil plastic, go kits, practice sealing, steps at home, pets, vehicles not airtight, how long, wait for all clear. https://www.cdc.gov/chemical-emergencies/response/shelter-in-place.html

CDC How to Safely Clean and Sanitize with Bleach: never mix bleach with ammonia or any other cleaner; open windows; gloves and eye protection. https://www.cdc.gov/natural-disasters/safety/how-to-safely-clean-and-sanitize-with-bleach.html

EPA Local Emergency Planning Committees: EPCRA, membership, plan reviewed at least annually, public information, find your LEPC through your SERC. https://www.epa.gov/epcra/local-emergency-planning-committees

PHMSA Pipeline Leak Recognition and What to Do: markers, signs of a leak, what to do and not to do. https://www.phmsa.dot.gov/safety-awareness/pipeline/pipeline-leak-recognition-and-what-do

CDC About Getting Clean (last reviewed June 10, 2026): remove clothing and shower within 10 minutes, 80 to 90 percent removed with clothing, cut off clothing, double-bag, wash 2 to 3 minutes, flush eyes 10 to 15 minutes, do not induce

vomiting, helping others, disposal, Poison Control 1-800-222-1222. https://www.cdc.gov/chemical-emergencies/response/get-clean.html

PHMSA Call Before You Dig: homeowners and professionals call 811; no cost; operators mark lines with flags or paint; states require calling 48 to 72 hours before digging; even small projects like planting trees or shrubs. https://primis.phmsa.dot.gov/stakeholder-comms/CBYD/

Chapter 21: Nuclear and Radiation Emergencies

Ready.gov Radiation Emergencies: types, time/distance/shielding, get inside/stay inside/stay tuned, 24 hours, brick or concrete, 10 minutes before fallout, lie face down, kit items, decontamination, food, pets. https://www.ready.gov/radiation

CDC Be Ready for Radiation Emergencies: get inside even from a car, schools keep children inside, stay inside until officials say safe, radio. https://www.cdc.gov/radiation-emergencies/features/be-ready.html

CDC Decontamination for Yourself and Others: remove outer clothing up to 90%, shower, no conditioner, clean clothes, helping others. https://www.cdc.gov/radiation-emergencies/infographic/decontamination.html

CDC How to Self-Decontaminate after a Radiation Emergency: bagging clothes, shower, no scrubbing, covering cuts. https://www.cdc.gov/radiation-emergencies/prevention/self-decontaminate.html

CDC Potassium Iodide (KI): protects only thyroid, timing, who should take it, allergy, table salt warning, FDA-approved products. https://www.cdc.gov/radiation-emergencies/treatment/potassium-iodide.html

NRC Emergency Planning Zones: 10-mile plume and 50-mile ingestion zones and actions. https://www.nrc.gov/about-nrc/emerg-preparedness/about-emerg-preparedness/planning-zones

NRC Backgrounder on Emergency Preparedness at Nuclear Power Plants: emergency classification levels, EAS, exercises every two years, FEMA role. https://www.nrc.gov/regulations-legislation/fact-sheets-brochures/backgrounder-on-emergency-preparedness-at-nuclear-power-plants

NRC Backgrounder on Dirty Bombs (reviewed Sept 15, 2026): definition, not a nuclear bomb, explosive more harmful than radioactive material, shelter in place or leave immediate area. https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/dirty-bombs-bg.html

Chapter 22: Civil Unrest and Active Threats

Ready.gov Attacks in Crowded and Public Spaces: stay alert, exit plan, warning signs, Run Hide Fight, helping wounded, when law enforcement arrives, mental health. https://www.ready.gov/terrorism

CISA Bomb Threat Checklist (2025): phone, written and email threat steps, questions to ask, do-not list. https://www.cisa.gov/sites/default/files/2025-08/Bomb_Threat_Checklist_082025_508.pdf

DHS How Do I Report Suspicious Activity: report to local law enforcement; If You See Something, Say Something campaign description. https://www.dhs.gov/how-do-i/report-suspicious-activity

CISA Active Shooter pocket card: Run Hide Fight details, silence devices, stay in secure location, call or text 911, two nearest exits, actions when law enforcement arrives. https://www.cisa.gov/sites/default/files/publications/CISA-Active-Shooter-Pocket-Card-052022-508.pdf

CISA Unattended vs. Suspicious Item card: HOT indicators and steps. https://www.cisa.gov/sites/default/files/publications/Unattended_vs._Suspicious_Item_Postcard_508Compliant.pdf

Brevard County, Florida Emergency Management, Civil Disorder: stay inside, close and lock windows and doors, listen to public safety officials, avoid affected areas. https://www.brevardfl.gov/EmergencyManagement/BePrepared/Step1KnowYourRisk/CivilDisorder

Chapter 23: Cyberattacks and Long Disruptions

NOAA Space Weather Scales: G1 and G5 effects and frequency per 11-year cycle. https://www.spaceweather.gov/sites/default/files/images/NOAAscales.pdf

CISA Secure Our World tip sheet: passwords 16 characters, password manager, MFA, phishing, updates. https://www.cisa.gov/sites/default/files/2024-09/Secure-Our-World-4-Easy-Ways-Stay-Safe-Online-Tip-Sheet.pdf

CDC emergency water: boiling times and bleach disinfection. https://www.cdc.gov/water-emergency/about/index.html

Ready.gov Build a Kit: water and food amounts. https://www.ready.gov/kit

CFPB: What happens if my bank or credit union has an outage: money protected, call number on card, other ways to pay, scams, automatic payments, fee credits, complaints. https://consumerfinance.gov/ask-cfpb/what-happens-if-my-bank-or-credit-union-has-an-outage-and-i-cant-access-my-account-en-2143

FTC consumer alert (July 2026): only-pay-this-way demands mean probably a scam; report at ReportFraud.ftc.gov. https://consumer.ftc.gov/consumer-alerts/2026/07/way-spot-scams-how-someone-asks-you-pay

FTC How to Recognize and Avoid Phishing Scams: back up data to external drive or cloud; contact company using a number or website you know is real. https://consumer.ftc.gov/articles/how-recognize-and-avoid-phishing-scams

FTC, DOJ and CFPB press release (Oct 2024): scammers quickly exploit weather emergencies. https://www.ftc.gov/news-events/news/press-releases/2024/10/ftc-doj-cfpb-warn-consumers-about-potential-scams-price-gouging-wake-hurricanes-other-natural

American Red Cross Power Outage Safety: keep gas tank at least half full. https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/power-outage.html

CDC emergency water supply: 2-week supply if possible. https://www.cdc.gov/water-emergency/about/how-to-create-and-store-an-emergency-water-supply.html

Ready.gov Get Involved: CERT program trains basic disaster response skills. https://www.ready.gov/get-involved

Chapter 24: Money Trouble and Job Loss

CFPB: An essential guide to building an emergency fund (definition, how to start, where to keep it, when to use it). https://www.consumerfinance.gov/an-essential-guide-to-building-an-emergency-fund/

U.S. Department of Labor: How do I file for unemployment insurance? (eligibility, filing, two to three weeks, DUA definition). https://www.dol.gov/general/topic/unemployment-insurance

DOL Employee Benefits Security Administration: Protecting retirement and health benefits after job loss (COBRA rules, 60 days, 18 months, 2 percent fee, special enrollment 30 days, HealthCare.gov). https://www.dol.gov/agencies/ebsa/workers-and-families/protecting-retirement-and-health-benefits-after-job-loss

DOL Employment and Training Administration: Disaster Unemployment Assistance (who qualifies, up to 26 weeks). https://oui.doleta.gov/unemploy/disaster.asp

CFPB: If I can't pay my mortgage loan, what are my options? (call servicer right away, options, HUD-approved counselor, HOPE Hotline, scam signs). https://www.consumerfinance.gov/ask-cfpb/if-i-cant-pay-my-mortgage-loan-what-are-my-options-en-268/

DOL DUA Fact Sheet: file within 30 days of the state's announcement; up to 26 weeks; contact state UI agency. https://oui.doleta.gov/unemploy/docs/factsheet/DUA_FactSheet.pdf

USDA: Facts About SNAP (what it is, EBT, eligible foods, how to apply). https://www.fna.usda.gov/snap/facts

USDA: SNAP applicant page (contact local SNAP office, state directory). https://www.fna.usda.gov/snap/applicant-participant

USDA: WIC Eligibility (eligible groups, health check, apply locally). https://www.fna.usda.gov/wic/eligibility

USDA: Disaster Nutrition Assistance Programs (D-SNAP). https://www.fna.usda.gov/disaster/nutrition-assistance-programs

USAGov: Get help with energy bills (LIHEAP, weatherization, shutoff policies). https://www.usa.gov/help-with-energy-bills

USAGov: Get help with bills after a disaster (LIHEAP, credit card, auto loan, student loans). https://www.usa.gov/disaster-help-with-bills

211.org: Call 211 for essential community services (confidential referrals). https://211.org/

CFPB: What is a payday loan? (amount, due date, fees, APR example). https://www.consumerfinance.gov/ask-cfpb/what-is-a-payday-loan-en-1567/

CFPB: Should I get a payday loan? (alternatives, rollovers). https://www.consumerfinance.gov/ask-cfpb/should-i-get-a-payday-loan-if-i-need-money-now-en-1583/

FTC: How to get out of debt (debt settlement fee rule, scam signs, choosing a credit counselor). https://consumer.ftc.gov/articles/how-get-out-debt

FTC: Job Scams (warning signs, reporting). https://consumer.ftc.gov/articles/job-scams

Chapter 25: Stranded: In Your Car or Outdoors

NWS What To Do If You're Caught in a Winter Storm: stay in vehicle, 10 minutes each hour, window, exhaust pipe, dome light, red cloth, raise hood, overexertion, unmelted snow, lean-to/snow cave, fire for heat and attention. https://www.weather.gov/safety/winter-during

USDA Forest Service If You Get Lost: STOP, stay put, tell someone details, layers, extra socks, blanket and matches. https://www.fs.usda.gov/visit/know-before-you-go/if-you-get-lost

NPS Ten Essentials: list and descriptions, tell someone, drink before thirsty, bright clothing. https://www.nps.gov/articles/10essentials.htm

NPS Outdoor Emergency Plan: practice your plan, pack whistle and mirror, bright clothing, lost group member steps, kids' Hug-A-Tree steps. https://www.nps.gov/articles/gtgemergencyplan.htm

NPS Outdoor Emergency Plan (printable): whistle three times, break, three times again; mirror signaling; call 911. https://www.nps.gov/subjects/healthandsafety/upload/NPS-Outdoor-Emergency-Plan-508c.pdf

NPS Desert Driving Safety: return plan, several days of supplies, satellite messenger, GPS apps, rescues stuck in sand, no gas stations. https://www.nps.gov/articles/000/desertdrivingsafety.htm

NPS Death Valley Summer Guide: stay with broken-down car, one gallon of water per day, heat illness signs, paved roads, tow hours away. https://www.nps.gov/deva/planyourvisit/summer.htm

Arizona Department of Transportation (2019): extreme heat breakdown steps: call for assistance, run AC or roll down windows, exit if too hot and find shade away from lanes, hot pavement, raise hood and hazards, avoid tall brush, water for everyone including pets, umbrella, hats. https://azdot.gov/news/prepare-yourself-your-vehicle-highway-trips-extreme-heat

CDC water treatment when hiking or camping: boiling, filter pore sizes, chemical, UV, burying waste. https://www.cdc.gov/drinking-water/prevention/water-treatment-hiking-camping-traveling.html

NOAA SARSAT 406 MHz beacons: PLB, EPIRB, ELT; registration required and free; alerts within minutes; phones don't always work in remote areas. https://www.sarsat.noaa.gov/emergency-406-beacons/

NOAA SARSAT Register Your Beacon: U.S. coded 406 MHz beacons must be registered by law; beaconregistration.noaa.gov; re-register every two years; keep information current. https://www.sarsat.noaa.gov/register-your-beacon/

CDC carbon monoxide basics: common symptoms; sleeping people can die before symptoms (same facts as Chapter 9). https://www.cdc.gov/carbon-monoxide/about/index.html

NWS Nashville flooding: 12 inches of moving water can carry away a small car. https://www.weather.gov/ohx/flooding

Chapter 26: After the Disaster: Recovery

CDC Returning Home After a Natural Disaster: when to return, structural damage, utilities, electricity, generators 20 feet and CO detector, floodwater, food, mold gear and bleach, insurance photos, kids, helplines. https://www.cdc.gov/natural-disasters/safety/returning-home-after-natural-disaster.html

CDC Reentering Your Flooded Home: gas smell steps, building inspector, electrician, flashlights not candles, well testing, assume mold. https://www.cdc.gov/floods/safety/reentering-your-flooded-home-safety.html

CDC Guidelines for Cleaning Safely After a Disaster: gear, 24 to 48 hours, bleach, lifting 50 pounds, teams of two, pacing, CO from cleanup equipment, wound care, keep kids and pets away. https://www.cdc.gov/natural-disasters/safety/index.html

CDC Chain Saw Safety: protective gear, manual, power lines, spring poles, cut at waist level, 150 feet and 30 feet. https://www.cdc.gov/natural-disasters/safety/chain-saw-safety.html

FloodSmart Document Flood Damage: photos and video, serial numbers, samples, receipts, contact insurer, mold 24-48 hours and coverage. https://www.floodsmart.gov/recover/document-damage

DisasterAssistance.gov FAQs: FEMA Helpline 1-800-621-3362 and hours, TTY, how to apply, insurance and duplication, programs do not replace insurance, appeals 60 days, SBA loans. https://www.disasterassistance.gov/help/faqs

DisasterAssistance.gov Housing Assistance (FEMA IHP): rental, lodging, home repair and replacement, eligibility basics. https://www.disasterassistance.gov/get-assistance/forms-of-assistance/4471

FEMA Individuals and Households Program: housing help, other needs (personal property, vehicles, moving and storage, medical, dental, child care, funeral), not a substitute for insurance, basic eligibility. https://www.fema.gov/assistance/individual/program

SBA disaster assistance: homeowners and renters, $500,000 and $100,000 limits, 12-month deferral, 4% cap, 30 years, 1-800-659-2955. https://www.sba.gov/disaster/

FTC How To Avoid Scams After Weather Emergencies and Natural Disasters: contractor tips, payment methods, FEMA doesn't charge fees, ReportFraud.ftc.gov. https://consumer.ftc.gov/articles/how-avoid-scams-after-weather-emergencies-and-natural-disasters

American Red Cross Power Outage Safety: stay at least 35 feet from fallen power lines and anything they touch; call 911 (same source as Chapter 10). https://www.redcross.org/get-help/how-to-prepare-for-emergencies/types-of-emergencies/power-outage.html

Earthquake Country Alliance gas safety: only utility personnel or qualified plumbers restore gas (same source as Chapter 9). https://www.earthquakecountry.org/step1/gassafety/

FTC consumer alert (July 2025): Spot and avoid FEMA impersonators: no charges, inspectors don't ask for banking info, badges, unexpected calls and texts, call 1-800-621-FEMA (3362). https://consumer.ftc.gov/consumer-alerts/2025/07/spot-avoid-fema-impersonators

FloodSmart: landlord's insurance won't protect renters' belongings; renters insurance typically excludes flood (same source as Chapter 13). https://agents.floodsmart.gov/articles/what-renters-dont-know-about-flood-insurance-coverage

Ready.gov Floods: people with asthma, lung conditions or immune suppression should not enter buildings with water leaks or mold (same source as Chapter 13). https://www.ready.gov/floods

FEMA Donate and Volunteer Wisely (2023): financial donations most effective, overflow of donated items, unaffiliated volunteers should not self-deploy, NVOAD lists trusted organizations. https://www.fema.gov/press-release/20230502/donate-and-volunteer-wisely

Ready.gov Get Involved: donate cash to nonprofits, reputable organizations, NVOAD, CERT. https://www.ready.gov/get-involved

Chapter 27: Checklists and Forms

Ready.gov, Build a Kit: basic kit and additional items lists, water and food amounts, update your kit every year. https://www.ready.gov/kit

Ready.gov, Water: one gallon per person per day; more for children, nursing mothers, sick people and hot climates; keep bottled water sealed in a cool, dark place; replace other stored water every six months. https://www.ready.gov/water

Ready.gov, Car Safety: car kit items. https://www.ready.gov/car

National Weather Service, Before Extreme Cold: winter car kit items. https://www.weather.gov/safety/cold-before

About This Book

This book is a plain plan for every kind of emergency in the United States. Part 1 gets you ready: knowing your risks, a family plan, water, food, emergency kits, alerts, sheltering or evacuating, first aid, home safety, and power outages. Part 2 covers what to do when it happens, from hurricanes, tornadoes, and floods to wildfires, earthquakes, winter storms, heat, disease outbreaks, chemical and radiation emergencies, civil unrest, cyberattacks, money trouble, and being stranded.

Part 3 covers recovery after a disaster, and Part 4 gives you checklists and forms you can fill in. The facts come from official U.S. sources, listed at the back so you can check them yourself.