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Safe Waste Disposal

Waste storage, burning, compost – Hygiene in disaster situations



Waste attracts disease. Rats, flies, germs – uncollected waste becomes a deadly hazard. Systematic disposal is mandatory.

1. Waste Separation in Emergency

Category	Examples	Disposal
Organic	Food scraps, plants, paper (unprinted)	Compost, Bokashi, deep burial
Burnable	Cardboard, wood, hygiene products	Fire pit (outside! Watch wind!)
Recycling	Metal, glass, plastic (non-burnable)	Store separately, dispose later
Toxic/Hazardous	Batteries, chemicals, medications, oil	Sealed tightly, separate, label
Biological	Wound dressings, excrement, tampons	Double wrapped, disinfection, deep burial

2. Waste Storage

- **Trash can with lid:** Waterproof, animal-proof (rats, cats)
- **Trash bags:** Robust, double, tie knots, take out daily
- **Location:** Outside house, wind-protected, not near window
- **Odor:** Sprinkle lime, sawdust, cat litter on organic waste
- **Daily disposal:** Don't store organic waste overnight in house

3. Burning (Emergency Waste Incineration)

- **Location:** Minimum 20m from house, wind-protected, not under branches
- **Fire pit:** Pit or old barrel, surrounded with stones
- **Never in wind:** Sparks flying! Never during drought/wildfire warning
- **Only burnable items:** No plastic (toxic fumes!), no batteries, no spray
- **Extinguisher ready:** Bucket of water, sand, soil
- **Burn completely:** Let ashes cool, then bury

4. Emergency Composting

- **Pit:** 1m deep, 1x1m, covered with earth/plate
- **Only organic:** Vegetable scraps, fruit peels, cardboard (unprinted), sawdust
- **Never:** Meat, fish, fats (attracts rats, stinks!), diseased plant material
- **Carbon:** For each layer of greens, add layer of browns (leaves, sawdust, earth)
- **Duration:** 6-12 months until usable humus

5. Checklist: Waste Disposal

☐ 100+ robust trash bags

☐ 2 trash cans with lids (organic, residual)

☐ Cat litter / lime / sawdust (odor neutralization)

☐ Gloves (disposable, 20 pieces)

☐ Bleach (disinfection)

☐ Shovel (compost pit, burial)

☐ Defined fire pit (for burnable waste)

☐ Separate storage for batteries/chemicals

 More info: [Build Emergency Toilet](#) | [Washing Without Running Water](#)

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Charging Batteries Without Outlet

Solar, Dynamo, Car Battery – Power during Blackout



Blackout Scenario: When the power grid fails, smartphones, radios and lamps are useless without power. How do you charge batteries without an outlet?

1. Solar Chargers

The most reliable method during long-term blackout:

- **Foldable Solar Panel (10-20W):** Enough for smartphones, power banks, small devices
- **100W Fold Panel:** Charges larger power banks, tablets, small 12V batteries
- **Direct to phone:** USB output, no battery needed in between
- **With power bank:** Panel charges power bank during day, phone from power bank at night



Tip: A 20W panel needs approx. 3-4 hours of sun for a full phone charge. In cloudy weather it takes 2-3x longer.

2. Hand-Crank and Dynamo Chargers

- **Hand-crank dynamo:** 1 minute cranking = 3-5 minutes talk time (very exhausting!)
- **Bicycle dynamo:** Very effective if bike available (6V/3W)
- **USB hand-crank radio:** Combines radio + flashlight + USB charger

3. Car Battery as Power Source

The car battery (12V) is one of the largest available energy reserves:

- **12V-USB adapter (cigarette lighter):** Direct phone charging
- **Inverter (12V → 230V):** Charges laptops, batteries, small devices
- **Important:** Run engine regularly, otherwise battery drains!
- **Jump cables:** From one car to another (multiple cars = more energy)

⚠️ **Never discharge car battery below 50%!** Deep discharge permanently destroys the battery. Run engine every 2-3 hours for 15 minutes.

4. USB Power Banks – Mobile Energy Storage

Capacity	Phone Charges	Duration
10,000 mAh	2-3x	1-2 days
20,000 mAh	4-6x	3-4 days
50,000 mAh (Powerstation)	15-20x	2 weeks+

LiFePO4 100Ah (12V)

50-80x (via inverter)

Months (with solar)

5. Power Saving Mode for Phones

- **Airplane mode:** Saves 50-70% battery (no radio consumption)
- **Minimize brightness:** Display is biggest consumer
- **Close apps:** End background activities
- **GPS/Bluetooth off:** Only turn on when needed
- **Off at night:** Or airplane mode, only emergencies

6. Checklist: Power Without Grid

☐ Foldable solar panel (min. 20W)

☐ 2x Power bank 20,000mAh (fully charged)

☐ USB hand-crank radio with charger

☐ 12V-USB adapter for car

☐ Inverter 300W (12V → 230V)

☐ Car charging cables (USB-C, Lightning, Micro-USB)

☐ Replacement batteries for flashlight, radio

☐ Candles/storm candles (when all batteries empty)

 More info: [Generate Emergency Power](#) | [Wikipedia: Solar Energy](#)

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Making Alcohol Yourself

Distilling spirits, brewing beer, winemaking in emergencies

Alcohol is a universal disinfectant, fuel, and barter good. In an emergency, you can make it yourself.

Legal Notice

Distillation of alcohol is punishable in Germany without a permit (tax evasion). Fermentation is allowed.

Brewing Beer

- **Ingredients:** Malt, hops, yeast, water
- **Time:** 2-4 weeks
- **Yield:** 20 liters from 5kg malt
- **Strength:** 4-6% Vol.
- **Legal:** Allowed for personal use

Making Wine

- **Ingredients:** Grapes, berries, fruits, sugar, yeast
- **Time:** 4-8 weeks

- **Yield:** 1kg fruit = 0.7 liters must
- **Strength:** 8-14% Vol.
- **Legal:** Allowed, no registration required

Distilling Spirits

- **Process:** Ferment → Distill → After-ferment
- **Yield:** 10 liters must = 1-2 liters spirits
- **Strength:** 40-60% Vol.
- **Legal:** **Illegal without permit!**

Alcohol as Disinfectant

- At least 60% ethanol for disinfection
- Pure alcohol: 96% (denatured = undrinkable)
- Hand disinfection, wound cleaning, surfaces
- Attention: Does not eliminate spores!

Comparison

Beverage	Time	Strength	Legal
Beer	2-4 weeks	4-6%	✓ Allowed
Wine	4-8 weeks	8-14%	✓ Allowed
Spirits	6-12 weeks	40-60%	✗ Illegal (without license)

Sources

- [Wikipedia: Alcohol](#)

- [Wikipedia: Distilling](#)
- [Wikipedia: Beer](#)

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Making Gasoline Yourself

Biofuels, wood gasifiers and emergency solutions for mobility

In a crisis, it can be vital to produce your own fuel. This article shows legal and illegal methods.

Legal Notice

Producing gasoline without a permit is prohibited in Germany. This article serves **emergency preparedness** and education.

Wood Gasifier

- **Function:** Wood is gasified with oxygen deficiency → Combustible gas
- **Construction:** Metal barrel + filter + hose to engine
- **Yield:** 1kg wood = approx. 1-2 liters gasoline equivalent
- **Difficulty:** High – engineering required
- **Legal:** Usually allowed for stationary generators

Bioethanol

- **Process:** Fermentation of sugar/starch → Distillation
- **Raw materials:** Corn, potatoes, apples, molasses

- **Yield:** 10kg potatoes = approx. 1 liter ethanol
- **Effort:** Very high, lots of energy required
- **Legal:** Small amounts (< 5L/year) are tolerated

Alkylate Gasoline (Emergency Replacement)

- **Super E10:** 10% ethanol, 90% gasoline
- **Methanol mixture:** Not recommended (corrosive)
- **Emergency:** Carburetor engines tolerate ethanol better

Vegetable Oils as Diesel Replacement

- **Rapeseed oil:** Can be used directly in diesel engines
- **Transesterification:** Vegetable oil + methanol → Biodiesel
- **Preheating:** Necessary in cold temperatures
- **Filter:** Particulate filter clogs faster

Comparison

Method	Effort	Yield	Risk
Wood gasifier	High	Medium	CO poisoning
Bioethanol	Very high	Low	Explosion hazard
Vegetable oil (Diesel)	Medium	Medium	Engine damage

Sources

- [Wikipedia: Biofuel](#)
- [Wikipedia: Wood Gas](#)

- [Wikipedia: Bioethanol](#)

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Blackout: Long-term Power Outage

Weeks without power – Water, Food, Heat, Security

 **A large-scale blackout can last for weeks.** Germany is extremely dependent on the power grid. Without electricity: no water, no ATM, no gas station pumps, no supermarket. Infrastructure collapses.

1. What NO Longer Works?

Infrastructure	Outage Time	Alternative
Power	Immediate	Crank radio, Solar, Generator, Candles
Water (City)	2-48 hours	Supply, Rain barrel, Well
Internet/DSL	Immediate	Radio, SMS, Messenger (Mesh)
Mobile network	2-72 hours (backup power towers)	SMS, Radio, SAT-Phone

Gas stations	Immediate	Fuel canisters (full!), Bicycle
Supermarkets	Immediate (cash registers, cooling)	Emergency supply, Cash, Barter
ATMs/EC	Immediate	Cash, Barter
Heating (Gas)	Immediate (electric burner)	Wood stove, Fireplace, Heater
Refrigerator	4-12 hours (stays cool)	Don't open! Consume perishables first.

2. The First Week in Blackout

Day 1-2: Confusion

- Check power: Just your house or neighborhood/city?
- Turn on radio: Crank radio, emergency apps for info
- Collect water: Bathtub, buckets, water storage, rain barrel
- Refrigerator: **Don't open!** (stays cool 12h). Eat perishables first.
- Check on people: Neighbors, family, elderly – offer help

Day 3-7: Adaptation

- Water supply: Tap water fails → Supply, rainwater, well
- Food: Cans, dry rations, preserved food
- Cooking: Gas stove, camping stove, wood fire (in garden!)
- Heat: Multiple clothing layers, wool blankets, sleeping bag, foil (emergency blanket)
- Security: Darken houses, hide supplies, organize neighborhood

Day 8+: Long-term Operation

- Filter + disinfect water: Rainwater, river water, well water
- Energy: Solar panel, Generator, Car battery, Dynamo radio
- Communication: Radio (CB, PMR), Messenger apps, Message chain
- Hygiene: Wet wipes, Sponge bath, Wash basin (5L water can)
- Medicine: Pharmacies closed → First aid kit, Home remedies, Herbs

3. Long-term Strategies

- **Solar Setup:** 100W-Panel + Charge controller + 100Ah-Battery + Inverter = self-sufficient mini-system
- **Heating:** Wood stove/Fireplace (supplies!), Ceramic heater (gas)
- **Money:** Cash (500-1000€ in various bills). Barter: Food, Water, Tools.
- **Food:** Potatoes, onions, apples (shelf-stable), own planting (balcony/garden)
- **Security:** Organize neighborhood help (watch duty, shared meals)

4. Checklist: Blackout

☐ 14-day water supply (42L/person)

☐ 14-day food supply (cans, dry, preserved)

☐ Cooking option (gas + cartridges, 10+)

☐ Lighting: Candles, LED lamps, Flashlights + batteries

☐ Crank radio + emergency apps

☐ Heat: Wool blankets, Sleeping bags, Emergency blankets, warm clothing

☐ Solar panel + Powerbank (20,000mAh+)

☐ Cash (500-1000€)

☐ Fuel canisters (full, stabilized, safely stored)

☐ Extended first aid kit + personal medications (4 weeks)

☐ Hygiene items (wet wipes, soap, cat litter)

☐ Communication: Radio devices (PMR/CB), Messenger apps tested

 More info: [Generate Emergency Power](#) | [Charging Batteries Without Outlet](#) | [Wikipedia: Blackout](#)

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Bug Out Bag

The 72h evacuation backpack – packing list, weight, training



The Bug Out Bag (BOB) is your 72-hour survival kit. When you need to leave your house in 60 seconds – this backpack saves your life. It is always packed, always ready, always in the hallway next to the door.

1. What is a Bug Out Bag?

The Bug Out Bag (English: "Get-out backpack") is a **pre-packed backpack** for a **72-hour evacuation** (3 days). It contains everything you need to survive when you can no longer stay in or must leave your home.

- **Goal:** Survive 72 hours autonomously (water, food, shelter, first aid)
- **Weight:** Max. 15-20% of body weight (for adults: 10-15 kg)
- **Location:** Always in a fixed place (hallway, closet, car)
- **Check regularly:** Every 6 months: expiry dates, batteries, completeness

2. The Ultimate Packing List

2.1 Water (absolutely critical)

- **3 liters drinking water:** 1.5L bottles (stable, stackable) or water bladder

- **Water filter:** Sawyer Mini, LifeStraw or candle filter (supplementary)
- **Water treatment:** Chlorine tablets or bleach (2 drops/liter)
- **Drinking bag/cup:** Collapsible cup or stainless steel cup (can boil!)

2.2 Food (2,200 kcal/day)

- **Energy bars:** 6 pieces (granola bars, protein bars, nut bars)
- **Cans:** 3x small cans (tuna, beans, sausage – with pull-tab lid)
- **Dry rations:** Instant noodle soup, rice dish (only hot water needed)
- **Nuts/dried fruit:** 300g (energy, fats, vitamins)
- **Chocolate:** 2 bars (morale + quick calories)
- **Salt:** Small packet (electrolytes, flavor)

2.3 Shelter

- **Emergency tent or bivouac sack:** Ultralight (500g-1kg), waterproof
- **Sleeping bag:** 3-season sleeping bag (comfortable to 0°C)
- **Sleeping pad:** Inflatable or foam (cold protection from the ground!)
- **Emergency blanket:** 2 pieces (silver/gold, warm, waterproof, reflective)
- **Tarp/tarpaulin:** 3x3m multifunctional tarp (tent, ground, rain cover)
- **Paracord:** 10m (all-purpose rope, 550 type)

2.4 Clothing

- **Change of underwear:** 1x underwear, 1x socks (merino wool = antibacterial, warm even when wet)
- **Rain jacket:** Waterproof, breathable, with hood
- **Warm jacket:** Fleece or down (light, compressible)
- **Hat + gloves:** Wool hat, waterproof gloves
- **Neck gaiter/Buff:** Multifunctional (hat, scarf, face mask, sweatband)
- **Bandana:** Dust filter, bandage, sweat cloth, signal cloth

2.5 Fire & Heat

- **Lighter:** 2x (gas + petrol = backup)
- **Storm matches:** Waterproof box (50 pieces)
- **Fire starter:** Magnesium ferro rod (works when wet!)
- **Dry fuel:** Cotton balls in vaseline (waterproof, burns 5 min)
- **Candle:** Pillar candle (storm candle, burns 8h, heat + light)
- **Stove:** Camping gas stove (small, 100g cartridge, boils 1L in 3 min)

2.6 First Aid

- **Compact first aid kit:** Plasters, wound compress, bandage, triangular cloth, disinfectant
- **Painkillers:** Ibuprofen, Paracetamol (blister, 2 days)
- **Anti-diarrheal:** Loperamide (dehydrates quickly!)
- **Antihistamine:** Cetirizine (bee sting, plant allergies)
- **Moleskin:** Blister plasters (march injuries = most common reason for evacuation!)
- **Personal medications:** 5 days supply (blister, labeled)
- **Emergency blanket:** 2 pieces (silver/gold)

2.7 Tools & Navigation

- **Multitool:** Victorinox or Leatherman (knife, pliers, saw, screwdriver)
- **Pocket knife:** Fixed or folding (sharp, robust)
- **Paracord:** 10m (550, multifunctional)
- **Duct tape:** 2m wrapped on a pen (repair, seal, bandage)
- **Compass:** Analog (no power needed!)
- **Map:** Paper map of the region (1:50,000 or 1:25,000)
- **Pen + notepad:** Waterproof (Rite in the Rain or simple foil)
- **Signal mirror:** Rescue mirror or makeup mirror (SOS signals)

2.8 Communication & Light

- **Crank radio:** FM + emergency flashlight + USB charger (all in one!)
- **Whistle:** Signal pattern: 3 short = emergency (SOS)
- **Flashlight:** LED, waterproof, 200+ lumens + spare batteries
- **Headlamp:** Hands-free, ideal for night work, climbing, repairs
- **Glow sticks:** 2 pieces (no electricity, waterproof, marking)
- **Phone + power bank:** In waterproof bag, airplane mode (saves battery)

2.9 Hygiene

- **Toothbrush + toothpaste:** Travel size (morale!)
- **Soap:** Small piece or soap sheets
- **Wet wipes:** 1 pack (biodegradable)
- **Toilet paper:** 1 roll (halved, in plastic bag)
- **Trash bags:** 5 pieces (hygienic, waterproof, emergency toilet)
- **Disinfectant:** Hand sanitizer (100ml)

2.10 Documents & Money

- **ID:** ID card/Passport (copy sufficient)
- **Vaccination card:** Important for evacuation to emergency shelters
- **Insurance documents:** Copy (waterproof packaging)
- **Cash:** 50-100€ (bills + coins, power outage = no ATM!)
- **Contact list:** Important phone numbers on paper (not just in phone!)
- **Emergency card:** Meeting point, destinations, important addresses

3. Weight Optimization

Category	Recommended Weight	Tips
Water	3 kg	1.5L bottles, stackable. Filter instead of more water.
Food	2 kg	Energy bars, dry rations = light + calorie-rich
Shelter	2-3 kg	Bivouac sack instead of tent, inflatable sleeping pad
Clothing	1 kg	Merino = light + warm even when wet
First Aid	0.5 kg	Compact set, blister instead of bottles
Tools	0.5 kg	Multitool + Paracord = lots of function, little weight
Communication	0.5 kg	Crank radio integrates light + charger
Hygiene	0.3 kg	Travel sizes, sheets instead of bottles
Total	10-15 kg	

4. The Backpack Itself

- **Volume:** 40-60 liters (too big = too heavy, too small = not enough)
- **Hip belt:** ESSENTIAL! 80% of weight on hips, not shoulders.

- **Sternum strap:** Prevents slipping, stabilizes when running/climbing
- **Waterproof:** Rain cover or inner bag (trash bag works as budget option)
- **Compartments:** Water separate (leakage!), first aid accessible (top)
- **Quick access:** Flashlight, knife, whistle outside (hip/shoulder strap)

5. Checklist: Bug Out Bag

☐ Water: 3L + filter + tablets

☐ Food: 3 days (bars, cans, dry rations)

☐ Shelter: Bivouac sack + sleeping bag + sleeping pad + tarp

☐ Clothing: Rain jacket, warm jacket, change of underwear, hat, gloves

☐ Fire: Lighter, ferro rod, **strike anywhere matches** (packed waterproof!), storm matches, candle, stove

☐ First Aid: Compact kit + painkillers + moleskin + emergency blanket

☐ Tools: Multitool + knife + paracord + duct tape + compass + map

☐ Communication: Crank radio + whistle + flashlight + headlamp + phone + power bank

☐ Hygiene: Toothbrush, soap, wet wipes, toilet paper, trash bags

☐ Documents: ID, vaccination card, cash (50-100€), contact list

☐ Backpack: 40-60L, hip belt, sternum strap, waterproof, padded

☐ Weight: 10-15 kg (max. 20% body weight)

6. Training!

A Bug Out Bag is only as good as the person carrying it.

- **Practice carrying:** 1x/week 30 minutes walking with backpack. Increase!
- **Practice packing:** 5-minute drill: Grab backpack in 5 minutes and go.
- **Practice route:** Test evacuation route on foot (without car!)
- **Overnight:** Once a year overnight with BOB in garden/forest (test equipment)



More info: [Create Evacuation Plan](#) | [Strike Anywhere Matches](#) | [Build Emergency Supplies](#)



Sources: [Wikipedia: Bug Out Bag](#)

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Chemical Accident & Poison Gas

Shelter, first aid, detection – surviving chemical threats



Chemical accidents can make entire regions uninhabitable. Toxic vapors, alkalis, acids – often invisible, immediately effective. The right reaction in the first minutes is decisive.

1. Recognizing a Chemical Accident

- Sharp, unusual odor (chlorine, ammonia, sulfur, bitter almond)
- Irritation of eyes, respiratory tract, skin (burning, tearing, coughing)
- Animals show restlessness, birds fall from the sky (highly toxic!)
- Visible cloud, colored smoke, liquid pools on streets
- Sirens: Siren signal for general danger (rising/falling)
- Warning apps: NINA, KATWARN – Check immediately!

2. Immediate Measures – Shelter in Place

In case of chemical accident: **NEVER** evacuate (unless official instruction)! Vapors are faster than you.

1. **Get in:** Immediately into house, close doors/windows
2. **Ventilation OFF:** Air conditioning, ventilation, chimney, extractor hood **ALL OFF**
3. **Seal:** Seal windows/doors with duct tape, wet cloths in cracks
4. **Top floor:** Chemical gases are usually **heavier** than air and sink! Stay high!
5. **Breathing:** Cloth/mask over mouth & nose (wet = better)
6. **Turn on radio:** Wait for official announcements
7. **Water:** Close pipes (water may be contaminated)

3. Important Chemicals and Their Properties

Chemical	Odor	Effect	First Aid
Chlorine	Sharp, pungent, swimming pool	Pulmonary edema, eye irritation	Fresh air, rinse eyes, doctor
Ammonia	Pungent, urine, cleaning agent	Respiratory irritation, skin burns	Fresh air, rinse skin with water
Hydrogen cyanide	Bitter almond	Respiratory paralysis, quickly fatal	Immediately fresh air, emergency call 112
Sulfur dioxide	Match, burnt	Lung irritation, shortness of breath	Fresh air, sit upright

Phosgene	Hay/green grass	Delayed pulmonary edema (fatal)	See doctor immediately – even if symptoms subside!
Acid (concentrated)	Pungent	Skin/eye burns	Rinse with water (15-20 min!), never neutralize
Alkali (sodium hydroxide)	Soapy	Skin/eye burns	Rinse with water (15-20 min!), rinse eyes immediately

4. First Aid for Chemical Contact

4.1 Eyes

- **Rinse immediately:** 15-20 minutes with **lukewarm** water
- **Keep eyelids open:** Rinse under the eyelid too
- **No ointment:** No eye drops/ointment without doctor!
- **Bandage:** Sterile compress, **DO NOT** press on the eye

4.2 Skin

- **Remove clothing:** Take off immediately (contaminated clothing = spreads!)
- **Shower:** 15-20 minutes with soap and water
- **NEVER neutralize:** Acid with alkali = Violent reaction! Only water!
- **No creams:** No ointments, no powder, do not rub

4.3 Inhalation

- **Fresh air immediately:** Get out of the area (watch wind direction)

- **Keep upright:** Sit or stand (lying = more irritation!)
- **Breathing:** Breathe deep and slow, do not hyperventilate
- **Oxygen:** If available – oxygen mask (if pulmonary edema suspected)
- **Doctor: Always** – even with seemingly mild irritation (phosgene works delayed!)

5. Checklist: Chemical Accident

☐ N95 masks / Respirator masks (10 pieces)

☐ Swimming goggles / Safety goggles (eye protection)

☐ Duct tape + foil (window sealing)

☐ Eye wash bottle (at least 500ml)

☐ Gloves (latex/nitrile, 20 pairs)

☐ Soap (lots – for hand washing/showering)

☐ Shower/water (15-20 minutes rinsing time possible)

☐ Ventilation can be turned off (AC, chimney, extractor)

☐ Crank radio (wait for announcements)

☐ NINA/KATWARN app installed



More info: [Radioactivity & Nuclear Meltdown](#) | [Set Up Shelter](#)



Sources: [Wikipedia: Chemical Accident](#) | [Wikipedia: Poison Gas](#)

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Earthquake: What to Do?

Drop, Cover, Hold On – Surviving without warning



Earthquakes come without warning. In Germany, the risk is moderate (Upper Rhine, Swabian Alb), but not to be underestimated. The right behavior in the first 60 seconds is decisive.

1. During the Quake: Drop, Cover, Hold On

Situation	Correct Behavior	What to Avoid
Indoors	Under sturdy table, protect head, hold on	Windows, balcony, elevator, stairs
In bed	Protect head with pillow, hold bed edge	Get up, windows
Kitchen	Protect head, away from stove/knives/glass	Kitchen cabinets, hanging pots
On the street	Stand between cars, avoid buildings	Under bridges, power lines, signs

In car	Stop, handbrake, engine off, protect head	On bridges, under bridges, at embankments
In supermarket	Away from shelves, crouch in shopping cart	Glass bottles, heavy shelves

2. After the Quake – Immediate Measures

1. **Stay calm:** Aftershocks are normal and usually weaker
2. **Turn off gas:** Immediately close main valve (leak risk!)
3. **Power off:** Main fuse out – short circuit risk with damage
4. **Fire:** Extinguish small fires (fire extinguisher, blankets). Large = Evacuate!
5. **Rescue:** Become first aider – but watch your own safety!
6. **No stairs:** Avoid stairs (collapse risk). Use emergency exits.
7. **Turn on radio:** Important announcements, aftershock warnings
8. **Phone:** SMS instead of calls (network overloaded). Emergency 112 only for life-threatening.

3. Leave Building or Stay?

- **Stay:** If building looks stable, no visible cracks, no gas smell
- **Leave:** Cracks in load-bearing walls, crooked doors, gas smell, fires
- **Avoid stairs:** Use emergency exits, fire escapes, windows (low floors)
- **On the street:** Avoid buildings (falling parts!), seek open areas

4. Home Preparedness (Earthquake Areas)

- **Secure furniture:** Tall shelves, cabinets to wall (brackets, screws)

- **Heavy objects:** No heavy pictures over bed/sofa. No glasses on top of cabinets.
- **Gas:** Flexible hoses (not rigid), earthquake safety for lines
- **Water:** Flexible connection, shut-off valve easily accessible
- **Emergency power:** Flashlight beside bed, crank radio

5. Checklist: Earthquake

☐ Table/stable cover identified (Drop, Cover, Hold On)

☐ Gas main valve: location known, access clear

☐ Power main fuse: location known

☐ Emergency exits/windows as escape route known

☐ Flashlight + shoes beside bed (glass shards!)

☐ Crank radio + spare batteries

☐ Water (3L/person/day) stored

☐ Heavy dishes/furniture secured

☐ First aid kit accessible



More info: [Natural Disasters: Survival Strategies](#) | [Set Up Shelter](#)

 Sources: [Wikipedia: Earthquake](#)

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First Aid: The Basics

Life-saving measures without a doctor - Step by step



Important: This wiki does not replace a first aid course! It is meant only to help in emergencies when no doctor is available.

1. Recognizing Life-Threatening Situations

The **3 major dangers** to life are:

1. **Airway obstruction** (person cannot breathe)
2. **Cardiac arrest** (no pulse)
3. **Severe bleeding** (life-threatening blood loss)

2. Clearing the Airways

2.1 Unconscious Person

1. Check response: Loudly call "Hello! Are you okay?" and gently shake the shoulders.
2. No response: Call for help (emergency: 112, if phone available)
3. Check breathing: Hold ear over mouth & nose, observe chest (max. 10 seconds)
4. If NO breathing: Begin **resuscitation** immediately (see below)

2.2 Airway Obstruction by Foreign Object

Adults and children over 1 year:

- Stand behind the person
- Wrap both arms around the upper abdomen
- Place one fist above the navel
- Pull inward and upward sharply (Heimlich maneuver)
- Repeat until the object is expelled

Infants (under 1 year):

- Lay infant face down on your forearm (head lower than body)
- 5 forceful back blows between the shoulder blades
- Then turn over, place 2 fingers on center of chest
- 5 quick compressions (press about 4 cm deep)
- Repeat until breathing is restored

3. Cardiopulmonary Resuscitation (CPR)

 **Immediate action for cardiac arrest:** Every minute counts! After 4-6 minutes without oxygen, irreversible brain damage threatens.

3.1 Check Before Starting

1. Lay person flat on their back (hard surface!)
2. Tilt head back slightly (lift chin)
3. Check breathing (10 seconds): Look, Listen, Feel
4. Check pulse: 2 fingers on neck (side of throat)

3.2 Chest Compressions (Heart Massage)

Parameter	Value	Note
Rate	100-120/min	Rhythm: "Stayin' Alive" (Bee Gees) or "Row the Boat"
Depth	5-6 cm	Not too shallow, not too deep
Position	Center of breastbone	Lower third of breastbone
Arms	Straight	Shoulders over hands, use body weight
Interruption	Max. 10 sec.	No pauses except for rescue breaths

3.3 Combining Rescue Breaths + Compressions

Ratio: 30 compressions : 2 rescue breaths

1. 30x chest compressions (approx. 15-18 seconds)
2. 2x rescue breaths (mouth to mouth, 1 second per breath)
3. Repeat without pause
4. **ONLY for infants:** 15:2 (due to oxygen reserves)

3.4 Compressions Only (if rescue breathing not possible)

If you **cannot** or will not perform rescue breathing:

- Chest compressions alone are **significantly better** than nothing!
- 120/min, 5-6 cm depth, don't stop
- Until medical help arrives or person breathes again

4. Severe Bleeding Wounds

4.1 Immediate Measures

1. **Apply pressure!** Most important. Simply press directly on the wound with your hand.
2. Use sterile or clean cloths (T-shirt, towel, bandage)
3. Keep wound **ELEVATED** above heart level (reduces blood flow)
4. Apply pressure bandage: Pressure on wound, wrap around, tie firmly

4.2 Arterial Bleeding (Life-Threatening!)

Signs: **bright red** blood fountain, **pulsing rhythmically**.

- Direct pressure on wound (first choice)
- If not possible: **Pressure point above** the wound
- Last resort: Tourniquet (**ONLY** if death otherwise threatens!)

5. Shock (Life-Threatening)

Signs: Pale, cold skin, weak pulse, thirst, restlessness, altered consciousness.

5.1 Shock Position

- Lay person on their back
- Elevate **legs** (pillow, bag, rolled clothing)
- Cover for warmth (even in heat!)
- Reassure, don't leave alone
- **No fluids!** (choking risk if unconscious)

6. Burns

Degree	Signs	Measures
1st Degree	Red, painful, no blisters	Cool under running water (10-20 min.)
2nd Degree	Blisters, very painful	Cool + sterile gauze + Doctor!
3rd Degree	White/black, leathery, little pain	Doctor immediately! No ointments/creams!

 **NEVER:** Oil, butter, ointments, toothpaste or flour on burns! This seals the skin and promotes infections.

7. Broken Bones

- **Open fractures** (bone visible): Sterile covering, pressure bandage, don't push back!
- **Closed fractures:** Immobilize (e.g., tied newspaper as splint)
- **Suspected spinal injury:** Do NOT move person! Stabilize head.

8. Checklist: First Aid Equipment

☐ Sterile wound dressings (various sizes)

☐ Triangular bandages (as sling, splint, pressure bandage)

☐ Plaster set (waterproof, hypoallergenic)

☐ Roll bandage / Leukoplast

☐ Disinfectant (e.g., Octenisept)

☐ Scissors, tweezers, gloves (latex/nitrile)

☐ Emergency blanket (silver/gold foil)

☐ Painkillers (ibuprofen, paracetamol)

☐ Antihistamine (cetirizine, for bee stings)

☐ Notepad + pen (for symptoms, medications)



More info: [Stocking Your First Aid Kit](#)



Archived: [Wikipedia: First Aid](#)



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Create Evacuation Plan

Route, Go-Bag, vehicle – Systematically out of the danger zone



Evacuation without a plan is chaos. Where to? With what? What to take? The evacuation plan gives clear answers – before it gets critical.

1. Evacuation Stages

Stage	Description	Time
1. Readiness	Danger recognized, monitor warnings	Hours to days
2. Preparation	Pack bags, fuel car, plan route	1-2 hours
3. Departure	Evacuation begins, traffic gets heavier	Now
4. Escape	Immediate leaving, no time to pack	Immediately

2. The 72-Hour Go-Bag (Evacuation Backpack)

This backpack is **always** packed and ready:

- **Backpack:** 40-60L, waterproof, robust

- **Water:** 3L (bottles/bladder) + water filter/tablets
- **Food:** Energy bars, cans, dry rations (3 days)
- **Clothing:** Change of underwear, rain jacket, warm jacket, boots, hat, gloves
- **Sleeping:** Sleeping bag, sleeping pad, bivouac sack
- **Hygiene:** Toothbrush, soap, wet wipes, toilet paper, trash bags
- **First Aid:** Compact set (plasters, disinfectant, painkillers)
- **Tools:** Multitool, pocket knife, rope (paracord), duct tape
- **Light/Fire:** Flashlight, headlamp, lighter, storm matches
- **Communication:** Radio, phone + power bank, whistle
- **Documents:** ID, vaccination card, insurance, contact list (waterproof!)
- **Money:** Cash (bills + coins, power outage = no ATM!)
- **Map:** Paper map of the region (GPS doesn't always work)

3. Planning Evacuation Route

1. **3 Routes:** Primary, secondary, pedestrian (if roads blocked)
2. **Destination:** Relatives, friends, emergency shelter, hotel outside
3. **Fuel:** Always keep tank half full (Quarter-tank rule)
4. **Alternatives:** Field paths, bike paths (main roads = traffic jam!)
5. **Print map:** Phone/navigation can fail
6. **Meeting point:** If family separated: Meeting point outside danger zone

4. The Evacuation Vehicle

- **Check:** Tires, oil, coolant, wipers, lights
- **Tank:** Always half full (on alarm: fuel up immediately!)
- **Emergency equipment in car:** Blankets, water, safety vest, warning triangle, first aid kit

- **Tools:** Shovel, tow rope, jumper cables
- **Navigation backup:** Paper map, compass

5. What to Do When Evacuation Order Comes?

1. **Stay calm:** Panic kills more than the disaster itself
2. **Turn on radio:** Follow authorities' instructions
3. **Secure house:** Close windows, turn off gas, power out (if time)
4. **Take pets:** Don't leave pets behind!
5. **Check neighbors:** Elderly, children, disabled – offer help
6. **Choose route:** Away from main currents, alternative routes
7. **Fuel on the way:** First gas station outside the area, fuel up immediately

6. Checklist: Evacuation

☐ 72h Go-Bag packed and ready

☐ 3 routes planned (car + foot)

☐ Destinations set (relatives, hotels, emergency shelters)

☐ Family meeting point set

☐ Car: tank half full, emergency equipment on board

☐ Paper maps printed

☐ Documents in waterproof packaging

☐ Cash available (50-200€)

☐ Pets: carrier, food, leash ready

☐ Neighbors informed / help network clarified

 More info: [Set Up Shelter](#) | [Bug Out Bag](#) | [Wikipedia: Evacuation](#)

 Sources: [Wikipedia: Evacuation](#)

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Making Your Own Biogas: Produce and Use

Gas from kitchen waste and slurry — cooking and power around the clock, without sun



Two hazards at once: Methane is explosive (4–16 vol.-% in air), and **hydrogen sulfide (H₂S) is toxic** — at high concentration it kills your sense of smell! Never run a digester pressure-tight, never indoors, always outdoors with distance to buildings.

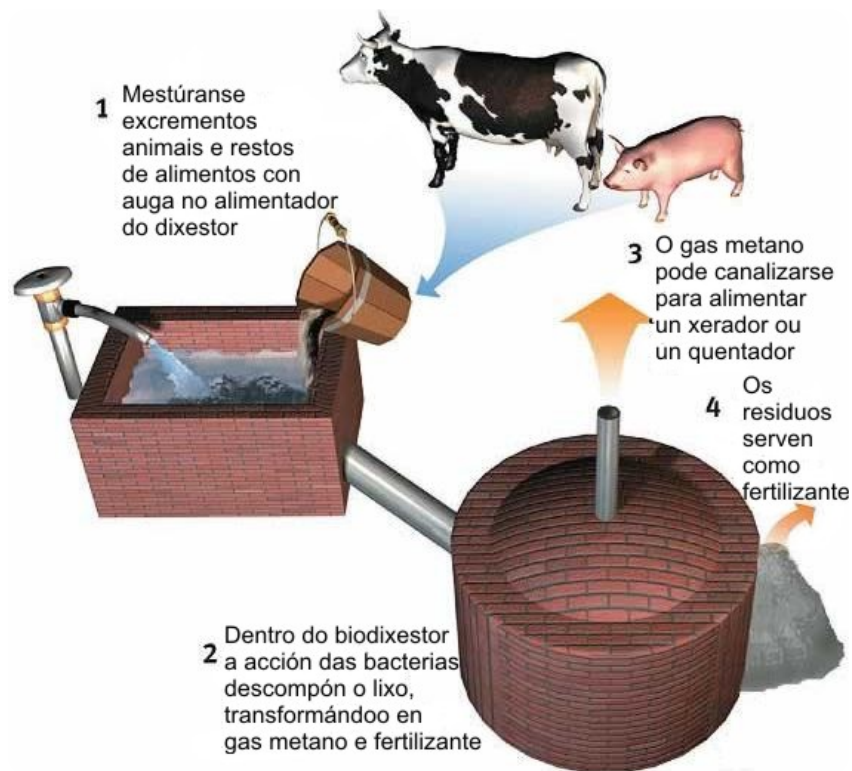
1. What is digester gas?

Digester gas (biogas) forms when organic matter is decomposed **without air** by bacteria. It consists of ca. **50–70 % methane** (the burnable part) and 30–50 % carbon dioxide. Suitable feedstocks: slurry and manure, kitchen scraps (not much meat!), grass clippings, leaves, digestible waste. The residue after digestion ("digestate") is a high-quality **fertilizer** — nothing is lost.

2. The DIY digester

1. **Vessel:** 200-liter drum, IBC container or drum in a pit — with a lid (but NOT pressure-tight! vent the gas via a hose)

2. **Inoculum:** slurry or mature compost — the bacteria must be there from the start
3. **Feeding:** small daily amounts of chopped organic waste + water (slurry consistency)
4. **Temperature:** 20–37 °C is the sweet spot; below 15 °C production collapses (winter: bury it, surround with compost, place in sun, insulate)
5. **Gas off the top, digestate released at the bottom** — feed continuously, never build pressure



Small biogas digester layout (photo: Miguel, CC0, via Wikimedia Commons)

3. Realistic gas yield

Substrate	Biogas	Notes
Kitchen scraps (cooked is better)	ca. 100–150 L per kg	Chop it! Bones/shells slowly

Cattle slurry	ca. 20–30 L per kg	Perfect inoculum/carrier
Grass clippings	ca. 100 L per kg	Fast to get; avoid acidification

For comparison: A 200-liter drum delivers only a few hundred liters **per week** depending on feeding. 1 m³ of biogas equals ca. 2 kWh of electricity or ca. 6 kWh of heat. For 1–2 hours of cooking on a gas burner you need ca. 0.5–1 m³ per day — this is a serious project, not a side effect.

4. Use: cooking, light, power

- **Cooking:** gas burner with a **larger jet** (biogas has less heating value than bottled gas) and adjusted air mix — ready-made biogas burners exist.
- **Lighting:** gas mantle lamp (like historic gas lanterns) — without electricity!
- **Power:** small generator with gas engine (CHP) — requires engine conversion/tuning, expertise.
- **Heat:** combustion chamber/heating coil in the greenhouse — heat is always a by-product.

5. Storage: low pressure is enough

Biogas is stored **not compressed** but at minimal overpressure: a **gas bag** (UV-resistant), a **floating bell** over water, or an inverted drum in a water-filled bucket. As much as needed, as low as possible — if it leaks, nothing flies into the air, it just escapes slowly.

6. Safety: the three fatal mistakes

1. **Ignoring H₂S:** hydrogen sulfide smells of rotten eggs — but at high concentration **the smell fades** and it is lethal! Open digesters only from a distance, never lean over, never indoors.
2. **Sealing pressure-tight:** a digester is **not a pressure vessel** — it must always be able to vent (water seal/safety valve), otherwise it bursts.
3. **Flashback:** water wash or backfire valve between storage and burner — otherwise the gas ignites inside the digester.

7. Winter operation

- Production drops sharply below 15 °C — bury the digester, surround it with compost, paint it black or place it in a greenhouse
- Insulation (straw, foil) and small solar absorbers on the south side help
- Plan bottled-gas reserves for winter

8. Checklist: biogas micro-setup

☐ Digester 200 L–1,000 L (drum/IBC), ventable

☐ Gas storage (bag/hose storage) + water seal

☐ Biogas burner or converted burner (larger jet)

☐ Shredder (scissors/blender) for kitchen waste

☐ H₂S warning + distance to buildings

☐ Digestate basin (fertilizer storage)

9. Did you know?

- In China millions of simple family digesters were counted — biogas from slurry has been the everyday solution there for cooking and light for decades.
- Bacteria work around the clock — also at night and under clouds. That makes biogas the perfect **complement to the sun**.
- The digestate is a full-value fertilizer — the cycle closes.



More info: [Store electricity — island solution](#) | [Make your own hydrogen](#)



Sources: [Wikipedia: Biogas](#) | [Wikipedia: Anaerobic digestion](#) | [Offline archive](#)

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CB Radio & Amateur Radio

Communication without network, without license, without fees



CB radio and PMR are often the last working communication in disasters. No license, no fees, no infrastructure needed.

1. CB Radio (Citizens Band) – 27 MHz

CB radio is freely usable in Germany (AM/FM, 80 channels):

- **Range:** 5-20 km (daytime), 50-100 km (night, via ionosphere)
- **Devices:** Mobile CB radios (80-200€), handhelds (30-80€)
- **Antenna:** Magnetic mount antenna for car, rod antenna for home
- **Emergency channel:** Channel 9 is used internationally as emergency channel
- **Power:** 12V (car battery) or power supply

2. PMR446 – The Walkie-Talkie Standard

- **16 channels:** 8 analog, 8 digital (dPMR)
- **Range:** 1-5 km (open field), 200-500m (city/buildings)
- **Power:** 2-3 AAA batteries or rechargeable, lasts 10-30 hours
- **Price:** 15-50€ per device

- **Subchannels (CTCSS):** 38 tones – filters out foreign conversations

3. Amateur Radio – For Advanced Users

The amateur radio range offers the greatest range and reliability:

- **Class E:** Entry-level exam, VHF + shortwave up to 100W
- **Class A:** Full scope, all bands, up to 750W
- **Devices:** Handheld radios (Baofeng UV-5R: 25€), shortwave transceivers (100-500€)
- **Antennas:** Dipole, vertical, long wire – depending on band
- **Relays:** Automatically forwarding stations on mountains (great range)

4. Radio Protocol in Emergency

1. **Call sign:** "Delta-One to all stations, emergency message"
2. **Short and concise:** "Flooding, corner Mainzer Street, 2 people on roof, urgent help needed"
3. **Wait for acknowledgment:** Don't keep talking until "Understood" comes
4. **Keep channel open:** Wait 10 seconds after sending (avoid double conversations)
5. **Save power:** Sending consumes 10x more power than receiving

5. Checklist: Radio Equipment

☐ CB radio or PMR walkie-talkies (at least 2)

☐ Spare batteries / rechargeable batteries / charger

☐ Antenna (for CB: magnetic mount or rod)

☐ Headphones / headset (discrete communication)

☐ Frequency list printed

☐ Emergency channel marked (Channel 9 CB / Channel 1 PMR)

 More info: [Wikipedia: Amateur Radio](#)

 Sources: [Wikipedia: Amateur Radio](#)

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Healing with Food

Food as medicine – Home remedies for emergencies



Food is not medicine in the classical sense. For serious illnesses, accidents, or worsening symptoms: **Seek medical help immediately!** This guide shows how food can help with minor complaints when no pharmacy is available.

1. Food as Home Remedies – The Basics

Many foods contain bioactive substances that help with minor ailments:

- **Antibacterial:** Garlic, onion, honey, apple cider vinegar, ginger
- **Anti-inflammatory:** Turmeric, ginger, fish oil, berries, green vegetables
- **Pain-relieving:** Cherry, ginger, chili, fish oil
- **Calming:** Milk, banana, oatmeal, honey
- **Digestive:** Peppermint, ginger, apple cider vinegar, yogurt
- **Immune-boosting:** Citrus fruits, peppers, garlic, ginger, spinach

2. Home Remedy Recipes for Emergencies

2.1 Colds & Coughs

- **Honey-lemon tea:** 1 tsp honey + lemon juice in warm water. Soothes cough, vitamin C.
- **Ginger tea:** 5 slices fresh ginger in 500ml water, boil 10 minutes. Promotes sweating, immune-boosting.
- **Garlic milk:** 2 crushed cloves garlic in warm milk. Antibacterial, cough-soothing.
- **Onion syrup:** Cover sliced onion with honey, let sit overnight. Loosens mucus.
- **Salt water gargle:** 1 tsp salt in 250ml warm water. Gargle for sore throat (antibacterial).

2.2 Stomach & Intestinal Issues

- **Rice water:** Cook rice, drain water, drink this water. Binds for diarrhea.
- **Oatmeal porridge:** Cook oatmeal in water, eat slowly. Protects stomach-intestinal mucosa.
- **Banana:** Ripe banana for diarrhea (potassium, binding). Unripe banana = more binding.
- **Apple cider vinegar:** 1 tbsp in water before eating. Digestive-promoting, acid balance.
- **Chamomile/peppermint tea:** For nausea, cramps, bloating (herbs from stock).
- **Potato juice:** Squeeze raw potato, drink juice. For heartburn (alkaline).

2.3 Wounds & Skin

- **Honey:** Apply to wound, sterile plaster over it. Antibacterial, wound-healing.
- **Onion juice:** On insect bite, minor burn. Anti-inflammatory.
- **Aloe Vera:** Cut open leaf, apply gel to burn/sunburn. Cooling, healing.
- **Potato slice:** On burn, dark circles, swelling. Cooling.
- **Baking soda paste:** Baking soda + water = paste. On insect bite, skin irritations, sunburn.
- **Olive oil:** For dry skin, dandruff, sunburn. Soothing.

2.4 Pain & Inflammation

- **Cherries/Cherry pit pillow:** Cherries contain anthocyanins (natural painkillers). For gout, arthritis.
- **Ginger:** 1g fresh ginger daily = works like ibuprofen (studies confirmed!). Muscle soreness, headaches.
- **Turmeric + pepper:** 1 tsp turmeric with black pepper in milk/water. Strong anti-inflammatory.
- **Willow bark:** Tea from willow bark = natural aspirin (salicylic acid). Headaches, fever.
- **Garlic:** 1-2 cloves daily raw. Blood-thinning, anti-inflammatory, blood pressure-lowering.

2.5 Sleep & Nerves

- **Warm milk + honey:** Tryptophan in milk promotes sleep. Honey stabilizes blood sugar.
- **Oatmeal:** Avenin calms nerves. Eat before sleeping.
- **Banana:** Magnesium + potassium relax muscles. Eat in the evening.
- **Chamomile/Linden blossom:** Tea before sleeping. Calming, mildly sedating.

3. Superfoods for Emergency Stock

Food	Nutrient Bomb	Shelf Life	Emergency Use
Honey	Antibiotic, wound-healing, energy	Unlimited	Wounds, cough, energy, preservation
Garlic	Antibacterial, immune-boosting, blood-thinning	Months (cool, dark)	Infections, circulation, blood pressure

Ginger	Anti-inflammatory, pain-relieving, digestive	Weeks (cool) / dried: years	Cold, nausea, pain
Turmeric	Strong anti-inflammatory, antioxidant	Years (dried)	Inflammation, arthritis, digestion
Apple cider vinegar	Disinfecting, digestive, pH-regulating	Years	Disinfection, digestion, skin, hair
Baking soda	Alkaline, disinfecting, versatile	Unlimited	Disinfection, toothpaste, skin, heartburn
Salt	Electrolytes, disinfecting, preservation	Unlimited	Disinfection, gargling, electrolytes, preservation
Sugar	Energy, wound healing, preservation	Unlimited	Energy, wounds (sugar paste), preservation

4. Checklist: Healing with Food

☐ Honey (1kg, natural, unlimited shelf life)

☐ Garlic (1 bulb, cool, dark)

☐ Ginger (200g fresh or dried)

☐ Turmeric + black pepper (100g)

☐ Apple cider vinegar (500ml, naturally cloudy)

☐ Baking soda (500g)

☐ Salt (500g, non-iodized)

☐ Lemons/lemon juice (preserved, vitamin C)

☐ Bananas (fresh, potassium, stomach-intestinal)

☐ Oatmeal (1kg, stomach-intestinal, nerves)

☐ Aloe Vera plant (fresh gel for burns)

☐ Olive oil (250ml, skin, burns)



More info: [Healing with Plants](#) | [Stock First Aid Kit Optimally](#)



Sources: [Wikipedia: Home Remedy](#) | [Wikipedia: Herbalism](#)

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Healing with Plants

Herbs, teas, ointments – Herbal medicine for emergency situations



Herbal medicine does not replace a doctor. For serious illnesses, accidents, or worsening symptoms: **Seek medical help immediately!**
This guide is for emergency situations when no doctor is available.

1. Safety in Herbal Medicine

- **100% Identification:** Only use known plants. Doubt = Leave out.
- **Dosage:** "The dose makes the poison." Too much can harm or kill.
- **Allergy test:** Apply small amount to skin, wait 15 minutes.
- **Children/Pregnant:** Many herbs are **NOT** suitable for children and pregnant women!
- **Documentation:** Note what, when, how much – for the doctor.

2. Medicinal Plants for Emergency Stock

Plant/Herb	Effect	Application	Caution
Chamomile	Anti-inflammatory,	Tea (flowers), eye compresses,	Allergy possible (daisy family)

	calming, antispasmodic	wound rinse	
Peppermint	Digestive, cooling, expectorant	Tea (leaves), essential oil (inhalation), stomach-intestinal	Infants: Do not use!
Ribwort plantain	Wound-healing, antibacterial, skin-soothing	Fresh leaves on wounds (plaster), tea (cough)	Don't contaminate open wounds with soil
Linden blossom	Diaphoretic, fever-reducing, calming	Tea (flowers), inhalation (cough, cold)	Heart patients: Caution (lowers blood pressure)
Thyme	Antibacterial, expectorant, immune- boosting	Tea (herb), inhalation, gargle solution (throat)	Thyroid problems: Caution
Sage	Antibacterial, anti- inflammatory, sweat-reducing	Tea (leaves), gargle solution (throat, gums)	Pregnant: Not in high doses!
Melissa (Lemon balm)	Calming, antispasmodic, diaphoretic	Tea (leaves), sleep, nervousness, stomach cramps	Thyroid: Caution
Calendula (Marigold)	Wound-healing, anti- inflammatory, antimycotic	Ointment (flowers), wound dressings, skin irritations	Allergy possible

St. John's wort	Wound-healing, mood-lifting, nerve-calming	Oil (flowers in oil), wounds, depression	Sunlight: Skin may react sensitively
Nettle	Blood-purifying, vitamin-rich, anti-inflammatory	Tea (leaves), young leaves as spinach, joints	Kidneys: Don't overdose
Yarrow	Wound-healing, hemostatic, antispasmodic	Tea (herb), wound dressings, stomach cramps	Pregnant: Contraindicated!
Coltsfoot	Expectorant, cough-soothing, anti-inflammatory	Tea (leaves), cough syrup, bronchitis	Liver: Not long-term in high doses
Dandelion	Diuretic, digestive-promoting, vitamin-rich	Tea (root/leaves), salad, liver/gallbladder	Gallbladder: Caution with gallstones
Plantain	Wound-healing, anti-inflammatory, hemostatic	Fresh leaves on wounds, tea (cough, diarrhea)	Kidney: Diuretic, drink plenty
Comfrey	Bone-healing, anti-inflammatory, pain-relieving	Ointment (root), baths, bruises, fractures, joints	Not on open wounds! Liver-toxic orally!

3. Preparation Methods

3.1 Tea (Infusion)

- **Amount:** 1-2 tsp dried herb per cup (250ml)
- **Water:** Freshly boil, pour over herb
- **Steep:** Let steep 5-10 minutes covered
- **Dosage:** 3x daily 1 cup (except for calming herbs in evening)

3.2 Tea (Decoction)

- **For roots, bark, seeds:** Hard parts need longer boiling
- **Amount:** 1 tsp per cup, **boil** 10-15 minutes
- **Examples:** Dandelion root, willow bark (painkiller!)

3.3 Ointment/Oil

- **Herbal oil:** Lay fresh flowers/leaves in oil (sunflower oil), 2-4 weeks in sunny place
- **Ointment:** Oil + beeswax (1:4) heat, let cool, fill in jars
- **Examples:** Calendula ointment, St. John's wort oil, comfrey ointment

3.4 Compresses/Packs

- **Tea compresses:** Lay soaked cloth on wound/skin area (chamomile, ribwort plantain)
- **Hot packs:** Warm herbal cushions for muscle tension, stomach cramps
- **Cold packs:** Cooled tea for swellings, insect bites

4. Checklist: Herbal Emergency Stock

☐ Dried herbs (chamomile, peppermint, ribwort plantain, thyme, sage)

☐ Herbal ointment (calendula or comfrey)

☐ Essential oils (peppermint, lavender, tea tree – disinfection, calming)

☐ Honey (natural antibiotic, wound-healing, cough)

☐ Apple cider vinegar (disinfection, skin, hair, digestion)

☐ Baking soda (disinfection, toothpaste substitute, skin irritations)

☐ Identification book for medicinal plants (with photos, offline!)

☐ Mortar/pestle (crush herbs)



More info: [Edible Wild Plants](#) | [Healing with Food](#) | [Stock First Aid Kit Optimally](#)



Sources: [Wikipedia: Medicinal Plants](#) | [Wikipedia: Herbalism](#)

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Flood Survival Guide

Before, during and after the flood – Step by step



Flooding is one of the most common causes of death in natural disasters. 30 cm of water can wash away a car. 60 cm is enough to make it float. Water is stronger than steel.

1. Recognizing Early Warning Signs

- Persistent rain over several hours/days (soil saturated)
- Rapidly rising water level in rivers, streams, canals
- Rumbling sound (approaching water, especially at night!)
- Animals fleeing (birds, mice, insects to higher areas)
- Gauge levels: [Pegelonline](#) – Check continuously during persistent rain
- Warning apps: NINA, KATWARN, MoWaS – Activate push notifications

2. Immediate Measures at Flood Warning

1. **Turn off electricity:** Remove main fuse **BEFORE** water enters. Electricity + water = deadly!
2. **Turn off gas:** Close main valve (leak risk with damage)
3. **Collect water:** Fill bathtub, buckets, pots (supply will fail!)

4. **Important documents:** ID, vaccination card, insurance – waterproof packaging, move higher
5. **Medications:** Personal medications + first aid kit at safe height
6. **Car:** Drive to higher location **IMMEDIATELY** (don't wait!)
7. **Clear basement:** Bring valuables, chemicals, heating oil upstairs
8. **Furniture:** Raise or bring to upper floor

3. During the Flood

- **Leave basement immediately:** Don't wait a minute. Water rises faster than you think.
- **Upper floor/Roof:** Seek higher floors. Roof as last resort.
- **Never walk through water:** 15 cm flowing water can knock down an adult
- **Never drive through water:** 30 cm = car floats. 60 cm = car is washed away.
- **No power lines:** Power lines can be in the water – deadly!
- **Don't drink tap water:** Water supply is contaminated. Boil!
- **Turn on radio:** Wait for announcements from fire department/THW
- **Call for help:** 112, wave cloth, whistle, light signals at night

4. After the Flood

- **Only enter house when fire department clears it:** Collapse risk!
- **Only have electricity turned on by professional:** Short circuit risk in wet house
- **Check gas:** If smell – immediately leave rooms, no lights on
- **Boil water:** Tap water is not drinkable until further notice
- **Take photos:** Document damage for insurance
- **No wet cleaning:** Let dry first (mold risk!). Pump, ventilate.

- **Drinking water:** Use boiled water or water rations

5. Flood Protection Preparedness

- **Basement flood protection:** Backflow flap in sewage pipe (prevents backflow)
- **Mobile flood protection:** Sandbags, flood protection plates, door threshold seals
- **Valuables:** Always store in upper floor
- **Empty rain barrel:** Empty rain barrel before flood (otherwise becomes a hazard)
- **Trees/Windows:** Remove trees from lines/roof, barricade windows

6. Checklist: Flood

☐ Power off, gas off (at warning)

☐ Collect water in bathtub/buckets

☐ Documents + medications at safe height

☐ Drive car to higher location

☐ Leave basement immediately, seek higher floors

☐ Never drive or walk through water

☐ Radio/crank radio for announcements

☐ Whistle + cloth for signaling

☐ Water filter/boiling option (drinking water becomes contaminated)

☐ Flood protection sandbags prepared

 More info: [Natural Disasters: Survival Strategies](#) | [Create Evacuation Plan](#) | [Wikipedia: Natural Disaster](#)

 Sources: [Wikipedia: Flood](#) | [Pegelonline](#)

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Communication in Disasters

When internet and mobile phones fail: Radio, alternative networks, and emergency communication



Communication is vital: In disaster scenarios, internet and mobile networks often fail. Alternative communication methods are essential for coordination and rescue.

1. The Communication Problem in Disasters

Typical failures:

- **Mobile network overload:** Everyone calls at once → network collapses
- **Power outage:** Cell towers have only 2-4 hours of backup power
- **Internet down:** DSL/cable needs power, routers don't work
- **Storm damage:** Towers knocked down, lines torn

2. Surviving Communication Methods

Method	Range	Power needed	Special feature
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Emergency Radio (FM/AM)	Regional	Battery/Crank	Emergency broadcasts, weather alerts
CB Radio (27 MHz)	5-20 km	12V / Mains	No license needed, 80 channels
PMR Radio (446 MHz)	1-5 km	Battery/AAA	Walkie-talkie, 16 channels, license-free
Amateur Radio (Ham)	Worldwide	12V / Mains	License required, most reliable system
Mesh Messengers	1-3 km	Smartphone battery	Bridgefy, Briar work without internet
SMS instead of calls	Network dependent	Minimal	SMS needs less bandwidth
Whistle / Siren	500m	None	Alarm signal, location marker

3. Emergency Radio – The Foundation

A battery-powered FM radio is the most important communication source:

- **Save frequencies:** Local emergency broadcast stations
- **Crank radio:** No battery needed, built-in flashlight + USB charger
- **Emergency alerts:** Enable emergency notifications on your phone
- **Radio on at night:** Important announcements come at any time

4. CB Radio & PMR for Neighborhood Communication

- **CB Radio:** 27 MHz band, 80 channels, up to 20km range. No license, no fees.
- **PMR446:** 16 channels, up to 5km. Very easy to use. 8 analog channels, 8 digital (better quality).
- **Channel coordination:** Emergency: Channel 9 (CB) or Channel 1 (PMR) as meeting point
- **Antenna height:** Higher = further. Attic, roof, tree.

5. Amateur Radio – The King of Emergency Communication

Amateur radio ("Ham Radio") is the most reliable communication method in disasters:

- **License required:** Course + exam (approx. \$100-200, one-time)
- **Range:** Shortwave reaches worldwide, VHF/UHF regional (30-100km)
- **Emergency communications:** Ham radio operators often coordinate rescue when everything else fails
- **Join a club:** Meet local operators, gain experience
- **Equipment:** Baofeng UV-5R (approx. \$30) – beginner handheld

6. Messengers Without Internet

- **Bridgefy:** Bluetooth mesh, 100m range, relays through other users
- **Briar:** Tor-like, encrypted, works over Bluetooth/WiFi Direct
- **Manyverse:** Decentralized, offline-capable, peer-to-peer

7. Create a Communication Plan

1. **Family meeting point:** Where do we meet if everything fails?
2. **Out-of-area contact:** Someone outside the disaster zone who relays messages
3. **Short messages:** "Safe. At grandma's. 2pm." – Low bandwidth, quickly understood
4. **Time windows:** Daily at 8:00 AM and 8:00 PM radio contact (saves energy)
5. **Code words:** For sensitive information (e.g., "Apple" = house secure)

8. Checklist: Communication

☐ Crank radio (FM/AM, with flashlight + USB)

☐ Battery radio + spare batteries

☐ CB radio or PMR walkie-talkies (2+ units)

☐ Smartphone + power bank + solar charger

☐ Emergency alert app installed & tested

☐ Important phone numbers on paper (not just in phone!)

☐ Whistle (location signal)

☐ Communication plan on paper



[Download as PDF](#)

 More info: [CB Radio & Amateur Radio](#)

 Sources: Wikipedia articles on amateur radio and emergency communications

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Food Preservation

Canning, drying, boiling, smoking – Making food last



Without power, food spoils quickly. Preservation is the knowledge that makes the difference between survival and hunger.

1. Preservation Methods Overview

Method	Shelf Life	Advantages	Disadvantages
Canning	2-5+ years	No refrigeration, robust	Heavy, can opener needed
Drying	1-2 years	Light, compact	Water needed for preparation
Canning/Boiling	1-2 years	Fresh, tasty	Glass, vacuum needed
Curing/Smoking	Months	Meat/fish preserved	Experience needed
Fermenting	Months-years	Probiotic, healthy	Susceptible to mold

Waxing/Olive oil	Weeks-months	Simple, cheese/vegetables	Limited shelf life
Vacuum sealing	2-5x longer	Freshness remains	Device + foil needed

2. Canned Goods – The Classic

- **Shelf life:** At least 2 years, often 5+. Can undamaged = safe.
- **Check:** Can bulging? Smells odd? Rusting? → Throw away!
- **Opening:** Can opener, multitool, or flat stone (rubbing)
- **Nutritional value:** Almost equivalent to fresh (Vitamin C suffers slightly)
- **Varieties:** Vegetables, fruit, meat, fish, beans, lentils, soups, complete meals

3. Drying / Dehydrating

Remove water = stop bacteria:

- **Sun:** Dry fruit slices, herbs, vegetables at 30°C+ (1-3 days)
- **Oven:** 50-70°C, door slightly open (moisture escapes)
- **Dehydrator:** Efficient, even, 8-12 hours
- **Dried fruit:** Apples, pears, bananas, apricots, raisins
- **Vegetables:** Peppers, tomatoes, zucchini, mushrooms, onions
- **Meat:** Beef jerky (slice thin, marinate, dry)
- **Storage:** Airtight, dark, cool. With silica gel desiccant.

4. Canning (Preserved Foods)

- **Jams:** High sugar content preserves (60%+ sugar)

- **Vegetables:** Vinegar or brine (lower pH = stop germs)
- **Canning machine:** Glass + rubber ring + clamp closure, 90°C/20-30 min
- **Shelf life:** 1-2 years in dark, cool storage
- **Check:** Lid bulging? Liquid cloudy? → Throw away!

5. Curing and Smoking

- **Curing:** Rub meat in salt + curing salt, store 1-2 weeks cool
- **Smoking:** Cold smoking (20-25°C, 12-48h) or Hot smoking (>60°C, 2-6h)
- **Shelf life:** Cured goods: months. Smoked goods: weeks-months (cool, airy)
- **Wood:** Beech, oak, alder, fruit wood (never conifer! Resinous!)

6. Storage Tips for Emergency Stock

- **Temperature:** 10-15°C optimal. Avoid temperature fluctuations.
- **Humidity:** Dry! Moisture = mold, rust, germs
- **Light:** Store dark (light oxidizes fats/vitamins)
- **Airtight:** Storage cans, Mylar bags with Oxy-Sorb, glass
- **Pests:** Stock protection: bay leaves, cedar wood, neem oil (natural)

7. Checklist: Preservation

☐ Can opener (2 pieces – one can break!)

☐ Canned goods (vegetables, fruit, meat, beans)

☐ Dried fruit and nuts

☐ Rice, pasta, oatmeal (airtight)

☐ Salt, sugar, oil, vinegar (natural preservatives)

☐ Canning jars + rubber rings (if self-canning)

☐ Vacuum sealer + foil (optional)

☐ Mylar bags + Oxy-Sorb (long-term storage)



More info: [Plan 14-Day Emergency Supply](#) | [Edible Wild Plants](#)



Sources: [Wikipedia: Food Preservation](#)

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Building Long-Term Supplies

Systematic preparation for 3, 6, and 12 months

Long-term supplies ensure survival during prolonged crises. This article shows how to systematically build supplies for 3, 6, and 12 months.

The 3-Stage Strategy

Stage	Duration	Focus	Cost approx.
1	14 days	Water, canned goods, medications	50-100 €
2	3 months	Basic food, hygiene, warmth	300-500 €
3	6-12 months	Long-term storage, self-sufficiency, sustainability	1000-3000 €

Category: Food

- **Grains & Legumes** (rice, lentils, beans) – 10+ years shelf life with dry storage
- **Dried milk & cheese** – 2-5 years, important for calcium
- **Oils & fats** – 1-2 years, store dark and cool
- **Honey** – practically unlimited shelf life
- **Salt & sugar** – unlimited, also for preservation
- **Dried fruit & nuts** – 1-2 years, energy source

Water & Beverages

- Minimum: 3 liters/person/day
- 30-day supply: 90 liters/person
- Glass bottles better than plastic (no plasticizers)
- Water purification tablets and filters as backup



Medicine & Hygiene

- 3-month supply of prescription medications
- Bandage materials, disinfectants, painkillers
- Soap, toothpaste, toilet paper (huge amounts!)
- Lighters, candles, flashlights with batteries



Warmth & Energy

- Gas/petroleum stove with 30 cartridges
- Candles (100+ pieces), waterproof matches
- Sleeping bags, wool blankets, warm clothing
- Solar panel + power bank



Rotation Principle

Consume the oldest supplies first and replace them immediately. Mark every item with purchase date. Keep an inventory list – Excel or simple paper.



Storage

- **Basement:** Cool, dark rooms ideal for grain, canned goods
- **Attic:** Only for dry, heat-resistant items

- **Multiple locations:** Never everything in one place
- **Pest-free:** Storage cans with lids, silica gel

Sources

- [Wikipedia: Survivalism](#)
- [Ready.gov: Food Storage](#)
- [KAT-WIKI: Emergency Supplies](#)

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Making Food Last

Preservation without refrigerator: Drying, salting, canning, fermenting

Preservation dramatically extends shelf life. Without a refrigerator, traditional methods are vital for survival.



Drying (Dehydration)

Removes water – microorganisms cannot grow.

- **Sun drying:** Fruit, vegetables, herbs on wire rack
- **Smoking:** Fish, meat – preserves + flavors
- **Oven drying:** 50-60°C with door propped open
- **Shelf life:** 6-12 months with dry storage



Salting & Curing

- Salt draws water from tissue
- Curing salt (with saltpeter) for pink meat
- Ham, bacon, salmon classically cured
- **Shelf life:** Months to years



Canning & Boiling

- Jars with rubber ring and clamp closure
- Boil 20 minutes at 100°C (water bath)
- Fruit, vegetables, soups, meat
- **Shelf life:** 1-2 years



Fermenting

- Lactic acid bacteria preserve vegetables
- Sauerkraut, kimchi, pickled vegetables
- No power needed – just salt and time
- **Shelf life:** 6-12 months



Cooling Without Power

- **Zeer pot:** 10-15°C in summer
- **Ground fridge:** 1m deep, insulated
- **Evaporative cooler:** Clay pot + wet jute
- **Ice block:** Freeze in winter, store in cellar



Shelf Life Overview

Method	Material	Shelf Life	Effort
Drying	Fruit, vegetables, herbs	6-12 months	Medium
Smoking	Fish, meat	2-4 weeks	High
Salting	Meat, fish	6-12 months	Medium
Canning	Fruit, vegetables	1-2 years	Medium
Fermenting	Vegetables	6-12 months	Low
Freezing (emergency power)	Everything	3-12 months	Low

Sources

- [Wikipedia: Food Preservation](#)
- [Wikipedia: Drying](#)
- [Wikipedia: Fermentation](#)
- [KAT-WIKI: Preservation](#)

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Defending Against Mobbing & Looting

Community, boundaries, de-escalation – Protection in societal crises



In times of crisis, the thin threads of civilization sometimes break. Looting, mobbing, peer pressure – often worse than the disaster itself. Community and clear boundaries are the best protection.

1. Psychology of Crises and Violence

- **Panic:** Leads to irrational decisions. Calm people survive.
- **Group mentality:** People in groups do things they would never do alone.
- **Disaster tourism:** Some come only to loot or take photos.
- **Neighborhood help:** Community protects. Loners are vulnerable.

2. Recognizing Mobbing and Looting

- Strangers circling the house/area, observing movements
- Spreading unfounded rumors ("The river is rising!"), to create panic
- Pressure on individuals: "Give us your water/food, we are more!"
- Intimidation: Loud noises, spotlights, groups in front of the house

- Threat of violence: "If you don't give, we'll take it."

3. Defense Strategies

3.1 Prevention

- **Build community:** Know neighbors, talk regularly, build trust
- **Watch duty:** Rotation: Someone is always awake, especially at night
- **Hide supplies:** Not visible. Multiple storage locations.
- **Privacy screen:** Darken windows, no lights outward, minimize noise
- **Communication:** Radio (PMR/CB), signal systems (whistle = alarm)

3.2 Confrontation

- **Never alone:** Always appear in a group. Individuals are vulnerable.
- **Appear confident:** Body language, voice, eye contact. Act like a victim = become a victim.
- **Set boundaries:** Clear, loud, without aggression: "There is nothing here. Move on."
- **De-escalation:** Don't provoke. Don't scream. Don't threaten. Calm, firm, repeat.
- **Share (strategically):** Giving a small amount can avoid escalation ("Here, take this, but then go.").
- **Alarm:** Whistle, noise, light. Attracts witnesses.

4. Legal Basics

- **Self-defense (§ 32 StGB):** Defense against unlawful attacks on body/life/freedom/property.
- **Necessity (§ 34 StGB):** Protection of higher-value goods (Life > Property).

- **Weapons:** Firearms, knives, batons are **NOT** allowed for defense (except gun license).
- **Everyday objects:** Umbrella, flashlight, keys = allowed.
- **Important:** Always flight before confrontation. Life > Property.

5. Checklist: Mobbing Defense

☐ Neighborhood help organized (contact list, meeting point)

☐ Watch duty rotation agreed

☐ Radios (PMR/CB) for quick alarm

☐ Whistle (alarm signal)

☐ Supplies hidden, multiple storage locations

☐ Windows can be darkened (foil, blankets)

☐ Pepper spray legally acquired and ready

☐ Emergency call 112 (only for acute life-threatening situations)

☐ Escape route: Car always fueled, Go-Bag ready

 More info: [Self-Defense Basics](#) | [Secure Your Home](#)

 Sources: [Wikipedia: Mobbing](#)

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Natural Disasters: Survival Strategies

Storm, flood, earthquake, wildfire – what to do when nature strikes back?



Guiding principle: In a natural disaster, every minute counts. Knowledge of proper behavior saves more lives than any equipment.

1. Storm & Hurricane (Wind Force 10–12)

1.1 Preparation (if time remains)

- **Close windows:** Close all windows and doors, but *don't* lock them (pressure equalization!)
- **Secure objects:** Bring loose garden items (furniture, flower pots) inside – they become projectiles
- **Power & gas:** Close main valves (for gas: close main valve)
- **Water:** Fill bathtub, buckets, pots with water (supply failure!)
- **Animals:** Bring pets to safety (basement, inner rooms)

1.2 During the Storm

- **Inner rooms:** Stay in the *center* of the house, away from windows
- **Avoid basement:** In case of flood risk, leave basement immediately!

- **Window breakage:** Immediately flee to an inner room, don't touch glass shards
- **Attic:** Leave – roofs can be torn off

1.3 After the Storm

- **Check gas:** If gas smell – immediately leave rooms, don't operate electrical switches!
- **Power lines:** Avoid fallen power lines (life-threatening!)
- **Drinking water:** Check water supply – often contaminated after storm
- **Turn on radio:** Wait for announcements from fire department/emergency services

2. Flooding & Inundation

2.1 Early Warning Signs

- Heavy rainfall over hours (soil already saturated)
- Rapidly rising water levels in rivers/streams
- Rumbling sound (approaching water)
- Animals fleeing to higher areas

2.2 Immediate Measures

- **Evacuation:** Immediately seek higher ground (upper floor, hill, attic)
- **Turn off power:** Switch off main distributor – electricity + water = deadly!
- **Important documents:** Bring ID, insurance papers, vaccination card to upper floors
- **Car:** Don't drive through water! 30 cm of water is enough to wash away a car
- **No basement:** Leave basement immediately, close doors (water pressure!)

2.3 In Flood (if trapped)

- **Roof:** If water rises – get on roof, call for help (phone, wave cloth)
- **No electricity:** Don't touch electrical devices, no power lines
- **Drinking water:** Use boiled water (tap water is contaminated)
- **Food:** Only canned food – avoid raw vegetables/fruit

3. Earthquakes

3.1 During Earthquake (Drop, Cover, Hold On)

Situation	Measure
Indoors	Get under sturdy table, protect head, hold on
No table	Kneel against wall, arms over head, face to floor
Window	Avoid windows! Glass splinters fly through the air
Stairs	Avoid stairs (collapse risk) – stay on the floor
On street	Stand between cars (not under bridges or buildings)

3.2 After Earthquake

- **Turn off gas:** Immediately close all gas valves (leak risk)
- **Power off:** Remove fuse (short circuit risk)
- **No stairs:** Avoid stairs (collapse risk) – use emergency exits
- **Turn on radio:** Wait for important announcements (aftershocks are normal!)
- **Help:** Become first aider, but watch your own safety

4. Wildfire

4.1 Recognition Signs

- Strong smoke smell, even if fire is far away
- Orange/red sky, visible flames
- Falling ash and charred leaves
- Animals fleeing (wildlife, birds)

4.2 Evacuation during Wildfire

- **Wind direction:** Flee *perpendicular* to wind direction (not directly away from wind)
- **Roads:** Stay on paved roads (no forest paths)
- **Water:** If possible – direction river, lake, pond (fire can't jump water)
- **Vehicle:** Car protects from heat, but keep engine running
- **Home:** If evacuation impossible – close all doors/windows, wet cloths at vents

5. Checklist: Natural Disaster Emergency Backpack

☐ Water (3L/person, for 3 days)

☐ Food (cans, energy bars, 3 days)

☐ First aid kit (including burn ointment)

☐ Flashlight + batteries (or crank light)

☐ Battery radio (crank radio ideal)

☐ Phone + power bank (full charge)

☐ Lighter + candles

☐ Emergency blanket (silver/gold)

☐ Important documents (vaccination card, ID, insurance)

☐ Medications (personal meds + painkillers)

☐ Hygiene items (wet wipes, soap, disinfectant)

☐ Knife, multitool, rope

☐ Gloves, dust mask (against dust/smoke)



More info: [Flood Survival Guide](#) | [Earthquake: What to Do?](#)



Sources: [Wikipedia: Natural Disaster](#)

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Create Emergency Supplies

The 14-Day Plan: Water, Food, Medicine, Energy – Step by Step



Emergency supplies are not panic mongering – they are common sense. The Federal Office for Civil Protection recommends: being able to survive 10 days autonomously. This guide shows step by step how to systematically build up a 14-day supply.

1. Why Emergency Supplies?

Germany is highly networked and dependent: power grid, water supply, logistics, Internet. A single point of failure can trigger chain reactions:

- Power outage → No pumps → No water → No supermarkets → No gasoline
- Flood → Roads blocked → Supply chains interrupted → Empty shelves
- Pandemic/War → Panic buying → Supply shortages → Panic

The state cannot help immediately. The first **72 hours** are crucial. A supply gives time, calm, and room for action.

2. The 14-Day Plan – Step by Step

Week 1: Water & Basic Food

- **Water:** 10 liters of purchased water (1.5L bottles, stackable). **Most important category!**
- **Rice:** 2kg (long-lasting, filling, easy to prepare)
- **Pasta:** 2kg (shelf life 2+ years)
- **Oatmeal:** 1kg (breakfast, muesli, energy)
- **Cans:** 5x vegetables, 3x fruit, 3x beans/lentils, 2x fish
- **Oil:** 1 liter rapeseed oil (cooking, fats, energy)
- **Salt:** 500g (unlimited shelf life, vital)
- **Cost:** approx. 30-50€

Week 2: Supplements & Proteins

- **UHT Milk:** 5L (durable, coffee, muesli, cooking)
- **Canned Meat:** 5x (sausage, chicken, beef – proteins!)
- **Nuts:** 500g almonds/walnuts (energy, fats, durable)
- **Chocolate:** 3 bars (morale, quick energy)
- **Onions/Potatoes/Apples:** 2kg each (cool, dark storage)
- **Spices:** Pepper, herbs, broth (flavor = morale!)
- **Cost:** approx. 30-50€

Week 3: Hygiene & Medicine

- **Toilet Paper:** 8 rolls (per person for 2 weeks)
- **Soap:** 2 bars of solid soap (lasts forever, no water needed)
- **Wet Wipes:** 3 packs (biodegradable)
- **Disinfection:** Octenisept, hand sanitizer (500ml)
- **Medications:** Painkillers (ibuprofen, paracetamol), diarrhea medicine, antihistamine, personal medications
- **First Aid Kit:** Extended (see First Aid Kit article)
- **Cost:** approx. 30-50€

Week 4: Energy & Light

- **Candles:** 20 storm candles (8-10h burn time)
- **Matches/Lighter:** 3 packs + gas lighter (weatherproof)
- **Flashlight:** LED + spare batteries (AAA/AA, 2 sets)
- **Crank Radio:** With flashlight + USB charger (approx. 30€)
- **Power Bank:** 20,000mAh (2 pieces, charge every 3 months)
- **Cost:** approx. 40-80€

3. Storage & Rotation

- **FIFO:** First In, First Out. New supplies in the back, old in the front.
- **Cool, dry, dark:** Basement, pantry, cupboard. 10-15°C ideal.
- **Check shelf life:** Every 6 months. Keep a list with quantity + expiration date.
- **Documentation:** Excel/paper list: What, where, how much, until when.
- **Canned goods:** Durable 2-5 years, often longer (safe).
- **Grain:** In airtight buckets with Oxy-Sorb = 10+ years durable.

4. Checklist: 14-Day Emergency Supply

☐ Water: 42 liters per person (3L/day)

☐ Grain: 4 kg (rice, pasta, oatmeal)

☐ Canned goods: 15-20 cans (vegetables, fruit, meat, beans)

☐ Fats: 1 liter oil + 500g nuts/chocolate

☐ Milk: 5L UHT milk

☐ Perishables: 2kg potatoes, onions, apples (cool, dark)

☐ Salt/Spices: 500g + herbs/broth

☐ Toilet Paper: 8 rolls/person

☐ Soap + Wet Wipes + Disinfection

☐ Medications (4 weeks) + First Aid Kit

☐ Candles + Matches + Flashlight + Batteries

☐ Crank Radio + Power Bank (20,000mAh)

☐ Cooking option (camping stove + 10 cartridges)

☐ Documents waterproof packaged

☐ Emergency suitcase / Go-Bag (see Bug-Out-Bag article)

5. Cost Overview

Category	Cost (1 person, 14 days)	Importance
Water & Food	60-100€	 Critical
Hygiene & Medicine	30-50€	 Critical
Energy & Light	40-80€	 Important

Communication	20-50€	 Important
Tools & Protection	30-60€	 Useful
Total	180-340€	

Tip: Build up the supply **step by step**. Invest 20-30€ every week = complete 14-day supply in 2 months.

 More info: [Plan 14-Day Emergency Supply](#) | [Bug Out Bag](#) | [Food Preservation](#)
 Sources: [BBK Emergency Supply](#) | [Wikipedia: Emergency Food](#)

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Generate Emergency Power

When the power goes out: Alternatives for light, communication, and warmth

 **Blackout Scenario:** In a large-scale, prolonged power outage most households are without energy after 24-48 hours. Preparation is crucial!

1. Priorities During Power Outage

1. **Communication** (Charge phone, radios)
2. **Lighting** (Safety in the dark)
3. **Warmth** (Winter: heating)
4. **Food** (Cooking, refrigerator)
5. **Information** (Radio, news)

2. Energy Sources Comparison

Source	Capacity	Runtime	Cost	Pros/Cons
Power Bank	20,000mAh	5-10 charges	20-50€	+ Mobile, quiet / - Limited capacity

Solar Panel	100W	Unlimited (with sun)	100-300€	+ Unlimited / - Weather dependent, daytime only
Gasoline Generator	1-3kW	8-12h/tank	300-1000€	+ Powerful / - Loud, gas fumes, maintenance
Dynamo/Hand Crank	5-20W	Unlimited	10-50€	+ Always available / - Very exhausting, low power
Car Battery	12V/50Ah	10-20h (low load)	80-150€	+ Quiet, available / - Deep discharge damaging
Candles/Lamps	-	8-40h	5-20€	+ Simple, warm light / - Fire hazard, no electricity

3. Solar Setup for Beginners

Recommended Basic Set:

- Foldable solar panel 100W (approx. 120-200€)
- Solar charge controller (PWM, 10A, approx. 15-30€)
- Lead-gel or LiFePO4 battery 100Ah (approx. 100-300€)
- Inverter 300-500W pure sine (approx. 50-100€)

Total Cost: approx. 300-600€ for a basic off-grid system.

💡 **Tip:** A 100W panel produces approx. 300-500Wh per day in Germany (depending on season). That's enough for phone charging, LED lights, and a small refrigerator.

4. Car Battery as Emergency Power Source

Warning: Standard car batteries are *not* suitable for deep discharge! Use **lead-gel** or **LiFePO4** batteries.

Connection:

1. Car socket (12V) → Inverter (230V)
2. Or directly: 12V LED lights, 12V cooler, 12V chargers
3. **Never run empty!** Keep at least 50% capacity

5. Saving Power in Emergency

- **LED instead of bulb:** 90% less electricity
- **Phone in airplane mode:** 50% less consumption
- **Refrigerator:** Only open when necessary, seal door with towel
- **Heat:** Multiple clothing layers instead of heating
- **Cooking:** Gas stove or camping stove instead of electric stove

6. Checklist: Emergency Power

☐ Power bank 20,000mAh (at least 2 pieces)

☐ Solar charger for phone (10-20W panel)

☐ LED flashlight + spare batteries

☐ Candles/storm candles (20+ pieces)

☐ Battery radio (crank radio ideal)

☐ Car battery + cables + fuses

☐ Inverter 12V → 230V (300W)

☐ Gas stove + cartridges (for cooking)

☐ Wool blankets/sleeping bags (for warmth)



More info: [Charge Batteries Without Outlet](#)



Archived: [Wikipedia: Emergency Power Generator](#)

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Plan 14-Day Emergency Supply

Water, Food, Hygiene – The complete plan for 2 weeks self-sufficiency



The Federal Office of Civil Protection recommends a 14-day emergency supply. In a disaster, supplies can be interrupted for days.

1. The 14-Day Emergency Supply – What do you need?

The emergency supply should bridge **10 days** (BBK recommendation) to **14 days** (extended).

1.1 Water (most important category)

- **3 liters per person/day = 42 liters per person** for 14 days
- Store in: 1.5L bottles, 5L/10L canisters, rain barrel
- Dark, cool (<15°C), separated from chemicals
- Sealed bottled water: 2-5 years shelf life

1.2 Food (minimum 2,200 kcal/day)

Category	Amount/Person/14 Days	Examples
Grain products	4 kg	Rice, pasta, oatmeal, bread spread
Canned goods	10-15 cans	Vegetables, fruit, beans, lentils, soups
Meat/Fish	2-3 kg	Canned sausage, tuna, chicken
Fats/Oils	1 liter	Rapeseed oil, sunflower oil, butter (can)
Dairy products	2 kg	UHT milk, cheese (shelf-stable), yogurt
Fruit/Vegetables (shelf-stable)	3 kg	Apples, potatoes, onions, carrots (cool, dark)
Sweets/Snacks	500g	Chocolate, nuts, dried fruit, energy bars
Salt/Spices	250g	Salt, pepper, herbs, broth

1.3 Hygiene & Medicine

- **Toilet paper:** 2 rolls/person/week = 4 rolls for 14 days
- **Wet wipes:** 2 packs (when water is scarce)
- **Soap/Disinfection:** Bar soap lasts forever
- **Trash bags:** 20 pieces (hygienic disposal)
- **Medications:** Personal medications for 4 weeks
- **First aid kit:** Extended (see first aid kit article)

2. Storage & Rotation

- **Cool, dry, dark:** Basement, pantry, cabinet
- **FIFO principle:** First In, First Out – New supplies at back, old at front
- **Check regularly:** Check expiration dates every 6 months
- **Canned goods:** Shelf-stable 2-5 years, often longer (safe)
- **Grains:** In airtight buckets with Oxy-Sorb (oxygen absorbers) = 10+ years
- **Documentation:** Keep list with quantity, expiration, location

3. Checklist: 14-Day Emergency Supply

☐ Water: 42 liters per person

☐ Grain products: 4 kg per person

☐ Canned goods: 10-15 cans per person

☐ Meat/Fish: 2-3 kg per person

☐ Oil/Fat: 1 liter

☐ Dairy products: 2 kg

☐ Fruit/Vegetables (shelf-stable): 3 kg

☐ Sweets/Nuts: 500g

☐ Salt/Spices: 250g

☐ Toilet paper: 4 rolls/person

☐ Hygiene items, soap, wet wipes

☐ Medications (4 weeks)

☐ Extended first aid kit

☐ Cooking option (camping stove + cartridges)

☐ Water filter/disinfection

 More info: [Food Preservation](#) | [Wikipedia: Emergency Supplies](#)

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Extracting Oils from Plants

Cold pressing, hot pressing, extraction – for food, lamps, soap

Plant oils are vital for nutrition, lighting, and soap making. In an emergency, you can extract them yourself.



Cold Pressing

- **Temperature:** Below 40°C
- **Quality:** Highest – vitamins are preserved
- **Yield:** 30-40% of seed weight
- **Suitable for:** Flax seeds, sunflower seeds, walnuts
- **Device:** Oil press (hand-operated or mechanical)



Hot Pressing

- **Temperature:** 60-100°C
- **Quality:** Medium – more nutrients destroyed
- **Yield:** 40-50% – higher than cold pressing
- **Suitable for:** Rapeseed, soy, cotton seeds
- **Disadvantage:** Oil oxidizes faster

Extraction with Solvent

- **Process:** Hexane or ethanol as solvent
- **Yield:** Up to 98%
- **Quality:** Low – residues possible
- **Industrial:** Soybean oil, sunflower oil
- **In emergency:** Not recommended (poison hazard)

Oils as Lamp Fuel

- **Rapeseed oil:** Best suited for oil lamps
- **Linseed oil:** Good, but expensive and quickly becomes rancid
- **Sunflower oil:** Works, but produces more soot
- **Important:** Wick must be chosen correctly (cotton)

Oils for Soap Making

- **Saponification:** Oil + lye (sodium hydroxide/potassium hydroxide)
- **Rapeseed oil:** Soft soap, good for beginners
- **Coconut oil:** Hard soap, lots of foam
- **Olive oil:** Mild soap, nourishing

Oil Plants Comparison

Plant	Oil Content	Pressing	Use
Sunflower	40-50%		Cold/Hot Food, Lamp
Rapeseed	40-45%		Cold/Hot Food, Lamp, Soap
Flax seeds	35-45%		Cold only Food, Wood

Walnut	60-70%	Cold	Food, Cosmetics
Olive	20-30%	Cold	Food, Soap



Sources

- [Wikipedia: Vegetable Oil](#)
- [Wikipedia: Oil Press](#)
- [Wikipedia: Cold-pressed Oil](#)

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Radioactivity & Meltdown

Shelter, decontamination, iodine – protection against invisible danger



Radioactivity is invisible, odorless, tasteless. It can travel thousands of kilometers. Protection is possible – but only with knowledge and preparation.

1. Types of Radiation and Dangers

Radiation	Range	Protection	Danger
Alpha	Few cm	Skin, paper, clothing	Strong if inhaled/swallowed
Beta	Up to 1m	Aluminum foil, thin metal plate	Skin burns, inhalation
Gamma	Hundreds of meters+	Concrete, lead, earth, water, distance	Penetrating, cancer, DNA damage
X-ray	Hundreds of meters	Concrete, lead, distance	Similar to gamma, less energetic

2. Nuclear Meltdown / Nuclear Accident – The Scenario

- **NPP nearby?** Check 50km radius: Philippsburg, Biblis, Grohnde, Brokdorf, Isar, Emsland, Neckarwestheim
- **Warning system:** Sirens (continuous tone), radio, NINA app, KATWARN
- **Evacuation zones:** Follow official instructions! **NEVER** decide yourself.
- **Iodine tablets:** Only upon official call! Protects kidneys + thyroid. **Do not take preventively!**

3. Protection Measures

3.1 When you are at home (Shelter-in-Place)

1. **Indoors:** Basement or innermost room (more walls = more shielding)
2. **Windows/doors:** Close, seal (duct tape, wet cloths, foil)
3. **Ventilation:** Turn off (AC, fans, close chimney)
4. **Water:** Tap water may be contaminated – boil or use canned goods
5. **Food:** Only preserved food (cans). No fresh vegetables/fruit.
6. **Duration:** At least 48-72 hours, often longer (cloud dispersion)

3.2 When you are outside

- **Get inside immediately:** Seek nearest building, basement, inner rooms
- **Breathing:** Cover mouth & nose with cloth/mask (particle filter)
- **Skin:** Cover as much skin as possible (jacket, hat, gloves)
- **Clothing:** Inside: remove clothes, wipe off, shower (if possible), pack in plastic bags

4. Decontamination (Cleaning after radiation exposure)

1. **Clothing:** Remove, shake off, pack in double plastic bags
2. **Shower:** Soap, shampoo, **DO NOT** scrub (grinds particles into skin!)
3. **Nose/mouth:** Nasal rinse, mouth rinse, toothpaste
4. **Hair:** Wash (radiation adheres to hair!)
5. **Water:** Used water is contaminated → do not reuse!

5. Long-term Measures

- **Food:** Only cans, dried products, sealed supplies. No fresh from outdoors.
- **Water:** Sealed water reserves. Rainwater after event: avoid for several months.
- **Soil:** Ground may be contaminated. Eat vegetables only after testing.
- **Dose:** Geiger counter (dosimeter) would be ideal, but rarely available. Follow official instructions.

6. Checklist: Radioactivity

☐ NINA/KATWARN app installed

☐ Iodine tablets in first aid kit (only upon official call!)

☐ Duct tape + foil (window sealing)

☐ N95 masks (respiratory protection, 10 pieces)

☐ Shower option + soap (decontamination)

☐ 14-day water/food supply (sealed, preserved)

☐ Plastic bags (clothing disposal)

☐ Protective clothing: thick jacket, hat, gloves, closed shoes

☐ Crank radio (official announcements)

 More info: [Chemical Accident & Poison Gas](#) | [Set Up Shelter](#) | [Wikipedia: Radioactivity](#)
 Sources: [Wikipedia: Radioactivity](#) | [Wikipedia: Nuclear Meltdown](#) | [BBK Radiation Protection](#)

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Set Up Shelter

The safe room – equipped, sealed, life-saving



A good shelter can save lives. Whether storm, explosion, nuclear attack or civil unrest – the right room makes the difference.

1. The Ideal Shelter in the House

The best shelter is **central, windowless, lower level**:

- **Basement:** Best option. Earth dampens shock waves, radiation and debris.
- **Inner rooms:** Hallway, stairwell, bathroom (if no exterior walls)
- **Avoid:** Attic, rooms with large windows, exterior walls
- **Apartment buildings:** Central stairwell = best protection position

2. Shelter for Various Dangers

Danger	Best Position	Additional Protection
Storm/Hurricane	Basement, inner rooms	Board up windows with planks/plates

Tornado	Basement or smallest room in center	Mattresses over yourself, bathtub
Explosion/Blast wave	Basement, behind load-bearing walls	Under table, no windows
Radioactivity	Basement, as deep as possible	Seal doors/windows, close ventilation
Chemical accident	Top floor (gas sinks!)	Seal windows/doors, wet cloths
Civil unrest/looting	Inner room, no visibility	Barricade doors, lights off
Flood	Upper floor/Roof	Avoid basement! Power off!

3. Equip Shelter

- **Water:** 10-20 liters minimum (3L/person/day)
- **Food:** Cans, energy bars, dried rations (3 days)
- **Radio:** Battery/crank radio for announcements
- **Light:** Flashlight, candles, glow sticks
- **First aid kit:** Complete, accessible
- **Blankets/sleeping bags:** Basement can be cold
- **Tools:** Hammer, multitool, rope, duct tape
- **Hygiene:** Bucket as emergency toilet, trash bags, wet wipes
- **Documents:** Waterproof packaged (ID, insurance)

4. Sealing (Radioactivity / Chemicals)

1. **Doors/windows:** Seal with tape (duct tape) – gaps, joints
2. **Ventilation:** Turn off or plug (wet cloths, foil)
3. **Chimneys:** Close and seal (ash filter)
4. **Power:** In chemical accident: turn off ventilation/AC (circulates poison!)
5. **Water:** Close pipes (contamination!)

5. Checklist: Shelter

☐ Central, windowless room identified (basement ideal)

☐ 3 days water + food stored

☐ Battery/crank radio available

☐ Flashlights + candles + lighter

☐ First aid kit + personal medications

☐ Blankets, sleeping bags, warm clothing

☐ Duct tape, foil, trash bags (sealing)

☐ Emergency toilet (bucket + bags + cat litter)

☐ Important documents waterproof packaged

☐ Tools: hammer, multitool, rope

 More info: [Create Evacuation Plan](#) | [Secure House](#)

 Sources: [Wikipedia: Bunker](#)

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Self-Defense Basics

De-escalation, escape, legal basics – protection without weapons



The best defense is escape. Property can be replaced – your life cannot. Confrontation is always the last resort.

1. Prevention Before Confrontation

- **Situational Awareness:** Always observe surroundings (exits, people, behavior)
- **Body language:** Walk upright, confident, purposeful. Don't appear like a victim.
- **Eye contact:** Brief, not challenging. Shows: "I have seen you."
- **Put phone away:** In dark/unsafe areas: no phone staring (blind!)
- **Groups:** Never walk alone through dark/abandoned areas
- **Escape route:** Always know: Where is the nearest exit/safe place?

2. De-escalation (Conflict Reduction)

- **Stay calm:** Panic escalates. Control breathing.
- **Language:** Low, slow voice. Don't shout, don't insult.
- **Hands visible:** Not in pockets. Open hands show peaceful intent.
- **Keep distance:** At least 2-3 meters. Never let them get too close.

- **Avoid victim role:** Don't beg, don't plead. Confident: "I don't have anything with me."
- **Give away:** Money, phone, bag – if demanded. Throw immediately, create distance, run away.

3. Physical Self-Defense (only if escape impossible)

3.1 Physical Principles

- **Goal: Escape.** Not win. Not defeat. **Get away.**
- **Weak points:** Eyes, nose, throat, solar plexus, knees, shin, ankle, groin
- **Unarmed:** Keychain between fingers, pen, deodorant spray (in eyes), flashlight (blinding)
- **Shout:** "FIRE!" or "POLICE!" attracts more attention than "Help!"
- **Force:** Don't hesitate. One quick, determined action surprises.

3.2 Simple Techniques

- **Palm strike:** Palm against nose/chin. Determined, forward.
- **Knee kick:** Knee to groin/thigh (at close distance). Escape!
- **Elbow:** Backwards to stomach/ribs (when grabbed from behind)
- **Stomping:** Heel on foot/instep (shock + release)
- **Eyes:** Fingers in eyes (only in life danger!)

4. Legal (Germany)

- **Self-defense (§ 32 StGB):** Defense against **current** unlawful attacks allowed.
- **Proportionality:** Means must match attack. Deadly force only against deadly threat.

- **Duty to retreat:** If escape possible → Escape. Self-defense only if **no other way**.
- **Weapons:** Firearms, knives, batons are **NOT** allowed for self-defense (except gun license).
- **Everyday objects:** Keys, umbrella, flashlight, deodorant spray = legal as tools.

5. Checklist: Self-Defense

☐ Pepper spray (legal, effective, 3-5m range)

☐ Flashlight 1000+ lumens (blinding + tactical)

☐ Whistle (alarm)

☐ Keys as emergency weapon (between fingers)

☐ Personal alarm (120dB, battery-powered)

☐ De-escalation trained (language, body language)

☐ Self-defense course attended (1x is enough for basics)

☐ Escape routes in all rooms/houses known



More info: [Defend Against Mobbing & Looting](#) | [Secure House](#)



Sources: [Wikipedia: Self-Defense](#)

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Secure House

Burglary protection, camouflage, alarm – the safe home in crisis times



Your house is your fortress. In crisis times, robbers and looters often appear days after the disaster. Prevention protects better than weapons.

1. Secure Access Points

- **Doors:** Solid wood or steel doors (at least RC2). Multi-point locking.
- **Windows:** Mushroom-head locking, lockable window handles, security film (shatter protection)
- **Basement windows:** Grille, bolt, light shaft cover
- **Garage:** Electric gate: block emergency release, reinforce access door
- **Garden:** Hedges instead of fences (harder to climb)
- **Thorn bushes:** Sow or plant bushes with long thorns under windows – the painful barrier deters burglars from climbing in
- **Gravel as early warning:** Cover access paths and some beds with gravel as audible as possible – footsteps on gravel are clearly heard even in the dark and deter intruders
- **Lighting:** Motion detectors (solar/battery-powered) at all access points

2. Visual Protection and Camouflage

- **Hide supplies:** Don't store visibly. Basement floor = not obvious.
- **No signs:** No empty water crate cartons, empty cans etc. visible disposal
- **Light discipline:** Light only in inner rooms, darken windows (film, blankets)
- **Noise:** Don't run generator outside (attraction!)
- **Social network:** Know neighbors, organize neighborhood help (more eyes = more security)

3. DIY Alarm System

- **Window contacts:** Self-adhesive, battery-powered, loud beeper
- **Motion detectors:** Solar/battery-powered, mount outside
- **WiFi cameras:** Battery/solar, local storage (not cloud-dependent)
- **Whistles:** Distribute through the house – and always keep one at the bedside within arm's reach. During a break-in: whistle = alert neighbors
- **Message chain:** WhatsApp/Signal group with neighbors (radio if network down)

4. Defense Without Weapons

- **Barricades:** Furniture in front of doors, bars through handles (door can't be pushed open)
- **Escape route:** Always have a second exit (back door, window, fire escape)
- **Pepper spray:** Legal, effective, range 3-5 meters
- **Blinding light:** Flashlight 1000+ lumens in the eyes (disorientation)
- **Noise maker:** Car alarm, whistle, fire extinguisher burst (irritating)
- **Avoid:** Avoid confrontation if possible – property is worth less than life

5. Checklist: House Security

- ☐ Doors: RC2, multi-point locking
- ☐ Windows: mushroom-head locking, security film
- ☐ Basement windows barred/locked
- ☐ Motion detectors (solar/battery) at all entrances
- ☐ Whistle at the bedside within reach
- ☐ Thorn bushes with long thorns under all windows
- ☐ Paths/beds covered with gravel (audible alarm)
- ☐ Window alarms (DIY, battery-powered)
- ☐ Supplies stored invisibly
- ☐ Light discipline: no visible lights to outside
- ☐ Neighborhood help organized
- ☐ Escape route identified (2nd exit)
- ☐ Pepper spray, flashlight (1000+ lumens) at hand

 More info: [Self-Defense Basics](#) | [Set Up Shelter](#)

 Sources: [Wikipedia: Home Security](#)

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Store electricity and use as island solution

Batteries, sizing and a safe island grid — self-sufficient without a grid connection



Short-circuit hazard and oxyhydrogen gas: A lead-acid battery bank can deliver over 1,000 amps in a short circuit — fuses directly at the positive terminal are mandatory! Charging lead batteries produces hydrogen: ventilation! 230 V in an island grid is just as dangerous as on the public grid.

1. Understanding the island solution

An island solution ("off-grid") consists of four building blocks: **generation** (solar, wind, generator), **storage** (battery bank), **conversion** (charge controller, inverter) and **distribution** (fuses, cables, loads). Self-sufficiency means: consumption and storage must be matched to each other — and generation must cover even the worst day (winter, clouds).

2. Storage technologies: an honest comparison

Technology	Cycles	Depth of discharge	Cost	Use
LiFePO₄ (LFP)	3,000+	80–90 %	expensive	Today's standard — safe, no memory effect, built-in BMS required
Lead-gel / AGM	approx. 500	only 50 %	cheap	Proven, heavy, maintenance-free — destroyed by deep discharge
Saltwater batteries	high	high	large & expensive	Very safe, but rarely available
DIY 18650 packs	variable	80 %	moderate	Only with BMS and tested cells — fire hazard with DIY solutions!



Lead-acid battery bank: cheap and proven — but only 50 % of the capacity usable (photo: Pseudoznanstvenik, CC BY-SA 3.0, via Wikimedia Commons)

3. Sizing: how to calculate correctly

1. **Measure consumption:** what does the household need per day? Example: LED lighting 100 Wh + fridge 600 Wh + laptop/phones 200 Wh + water pump 100 Wh = **1,000 Wh/day**
2. **Autonomy days:** how many days without sun/wind? Realistic: **2-3 days**
3. **Storage maths:** $1,000 \text{ Wh} \times 3 \text{ days} = 3,000 \text{ Wh} \div \text{depth of discharge} \rightarrow \text{LFP (90 \%): approx. 3.3 kWh; lead (50 \%): 6 kWh}$
4. **Generation:** PV panels deliver only 10-25 % of summer output in winter — size for winter sun or generator backup!

4. Charging and grid electronics

- **MPPT charge controller** between panel and battery (10-30 % more yield than PWM)
- **Sine-wave inverter** (not "modified") — motors, fridges and electronics need a clean sine wave; size = continuous load $\times 1.3$ + peaks (motors!)
- **RCD + fuses** per circuit — an island grid is just as dangerous as the public grid
- **Grounding** of the system and lightning protection (arresters) at antennas/masts

5. Load strategy: the right order

1. **Priority 1:** lighting (LED), communication (phone, radio), water pump
2. **Priority 2:** fridge (efficient model! 12/24-V version directly on the battery), freezer
3. **Taboo in island operation:** immersion heaters, hotplates, tumble dryers, fan heaters — for heat/cooking: gas, wood, solar thermal
4. **Switch off standby vampires** — 10-30 W of continuous load is a whole battery day

6. Building the battery bank: practice

- **Fuse directly at the positive terminal** of the battery (especially lead: the short-circuit current is brutal)
- **Cable cross-sections** generous (voltage drop!) — long thin cables = heat + losses
- **Temperature:** lead loses capacity in the cold (up to 30 % at $-10\text{ }^{\circ}\text{C}$), LFP must not be charged below $0\text{ }^{\circ}\text{C}$
- **Ventilate lead batteries** — charging produces oxyhydrogen gas (see warning above)
- **Balancing:** in series connection use balancers/BMS; never charge/discharge cells separately

7. Backup: the generator as a fallback

A petrol/diesel generator is the backbone during prolonged sunless periods: either via a charger (battery charging) or — for larger systems — directly at the inverter input (hybrid inverter). Important: **separate feed-in** — never run the generator and the island inverter in parallel on the same grid (island-grid coupling box or re-plug). Plan the runtime: 1–2 hours of generator charging is usually enough for a day.

8. Checklist: island-grid basic set

☐ Battery bank (LFP recommended) with BMS + fuse at the positive terminal

☐ Solar panel(s) + MPPT charge controller

☐ Sine-wave inverter (size: continuous load $\times 1.3$)

☐ RCD + outgoing fuses

☐ Emergency charger: generator + battery charger

☐ Power metering (smart plug) for calibration

9. Did you know?

- LiFePO₄ batteries survive **3,000+ charge cycles** — with daily charging that is over 8 years. Lead often manages only 1–2 years in cycle operation.
- Island grids are standard on **boats, cabins and mountain huts** — the technology is proven, and so are the mistakes: 90 % of all problems are wrongly dimensioned cables, missing fuses or overcharged/deep-discharged batteries.
- A **smart plug** (metering socket) for €10 shows you the real consumption — without measuring, sizing is guesswork.

 More info: [Build your own wind turbine](#) | [Generate emergency power](#)

 Sources: [Wikipedia: Energy storage](#) | [Wikipedia: Stand-alone power system](#) | [Offline archive](#)

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Build Emergency Toilet

Hygiene without sewage – bucket, composting toilet, compost



Without sewage, epidemics threaten. Cholera, typhus and diarrheal diseases spread quickly when wastewater is not disposed of. A functioning emergency toilet is vital.

1. The Simple Bucket Toilet

The quickest emergency replacement:

- **Materials:** 20L bucket with lid, trash bags, saw/saw chain, seat (camping toilet seat)
- **Setup:** Seat on bucket, trash bag as liner
- **After use:** Cat litter, sawdust, soil, peat sprinkle over (odor binder)
- **Seal:** Knot bag, lid on, take out of house
- **Note:** Per person 2-3 bags/day. Bags robust (double layer!)

2. Composting Toilet (more comfortable)

- **Function:** Separate solid and liquid waste
- **Advantage:** Liquid part less smelly, solid part compostable
- **Materials:** Two buckets, separation seat (or self-built with cardboard/plate)

- **Liquid:** Dilute with water (1:10), on plants/ground (not edible!)
- **Solid:** Cover daily with litter (sawdust, soil), compost after 2 weeks

3. Compost Toilet

- **Duration:** After 1-2 years composting, humus is safe and benefits plants
- **Rule:** Always cover with carbon litter (sawdust, straw, leaves, soil)
- **Temperature:** Heat accelerates composting (at least 1 year at >20°C)
- **Never fresh on vegetables:** Only after complete composting and only for ornamental plants/trees

4. Hygiene with Emergency Toilet

- **Wash hands:** Always! With soap and water (if scarce: disinfection)
- **Disinfection:** Wipe toilet bucket daily with bleach solution
- **Change trash bags:** Daily, never overfill
- **Storage:** Bucket outside living space (balcony, garage, basement hallway)
- **Odor:** Cat litter, lime, sawdust are the best odor binders

5. Checklist: Emergency Toilet

☐ 2x 20L buckets with tight lid

☐ 60+ robust trash bags (double layer recommended)

☐ Cat litter / sawdust / soil (odor binder, 10kg)

☐ Camping toilet seat or improvised seat

☐ Toilet paper (6+ rolls)

☐ Soap, sanitizer, wet wipes

☐ Gloves (disposable, 20 pieces)

☐ Bleach solution for disinfection



More info: [Safely Dispose Waste](#) | [Wash Without Running Water](#)



Sources: [Wikipedia: Composting Toilet](#)

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Strike Anywhere Matches: Use & Storage

SAW matches — they ignite anywhere, without a striking strip. Reliable in an emergency



Strike anywhere matches ignite on any rough surface. That's what makes them valuable — and requires deliberate storage: loose in a backpack they can ignite unintentionally.

1. What are strike anywhere matches?

There are two kinds of matches: **safety matches** ("strike on box") burn only on the specially coated striking strip of the box — and **strike anywhere matches** (short *SAW matches*), whose heads ignite on **any suitably rough surface**: stone, concrete, unglazed ceramic, denim, a shoe sole, a nail file.

The difference sits in the head: in safety matches the phosphorus sits on the striking strip; in strike anywhere matches it is directly in the head. This became possible with the **non-toxic head compound based on tetraphosphorus trisulfide** ("sesquisulfide") — proven in 1898 by the French chemists Savene and Cahen: non-toxic, heads not explosive. The Diamond Match Company acquired the US patent in 1900 and offered production to other companies. You can recognize strike anywhere matches by their **two-tone head**: red/reddish-brown ignition compound on top, a lighter striking strip (white/blue) below.



Strike anywhere matches with red heads; striking strip on the side of the box (photo: VR38DETT, copyrighted free use, via Wikimedia Commons)

2. Why they belong in your emergency kit

Property	Emergency advantage
No lighter needed	No gas, no mechanics, no long sparks-striking like with a ferro rod
Ignites anywhere	Stone, wall, edge, concrete — even if the box is missing
Cold-proof	No battery, no electronics — works reliably even in frost
Storable	Lasts decades when kept dry
Low cost	A box of 50–100 pieces costs just a few euros

3. How to strike them properly

1. **Grip safely:** Hold by the wooden shaft, head never toward your body.
2. **Strike:** Draw the head **away from your body** across the rough surface — quick and firm, don't grind.
3. **Good surfaces:** The box's striking strip, concrete, brick, river pebble, unglazed ceramic, a file. Bad: smooth surfaces like glass or painted metal (too little friction).
4. **Use the flame:** Let the burning match hang slightly, then light your tinder (candle, stove, fire pit) from below.
5. **Build the fire:** Fine tinder first (birch bark, waxed cotton), then thin twigs — never thick logs directly.



The flame sits at the head — let it burn briefly before adding tinder (photo: Jamie Street, CC0, via Wikimedia Commons)

4. Storage: the five ground rules

Rule	Why	How
Keep dry	Damp heads no longer ignite reliably	Airtight container (film canister, screw-top glass); add a silica gel pouch

Separate from friction	They ignite on any rough surface — including inside	Store heads UP, individually in straws/tubes or fixed in slots
Protect from heat	Strong heat (direct sun, car interior) can ignite the compound	Store cool and dark; never in the glove box or in sunlight
Plan a reserve	One box is not enough	At least 2× 50–100 pieces, distributed (main stock + bug out bag)
Keep from children	Ignites on everything	Out of reach/lockable — treat like lighters

5. The waterproof match container

The classic for the trail: a **small container with a tight lid** (film canister, tobacco tin, ready-made match containers with a strip in the lid). Pro trick: **heads down in the container** — the compound stays dry even if water gets in. Glue two strips of the original striking surface into the lid and the tin becomes a complete fire-starting kit.

- **Add backups:** lighter (gas), ferro rod (magnesium), stormproof matches (burn through wind/rain for ca. 10–15 seconds) — each covers a different failure mode.
- **Tinder:** wax-soaked cotton balls or birch bark — the match flame catches immediately.

6. Safety: the three key points

1. **Clear the fire site:** remove dry, flammable material around it; mind the wind; never leave a fire unattended.

2. **Extinguish thoroughly:** water/soil/sand, turn the embers and check — residual heat lasts hours.
3. **Care with gas:** sniff for gas before lighting stoves/heaters — strike anywhere matches ignite instantly, everywhere, including where you don't want it.

7. Checklist: fire equipment

- ☐ Strike anywhere matches: 2 boxes (50–100 pieces) in a waterproof container
- ☐ Spare striking strips (2 pieces) in the lid
- ☐ Stormproof matches (burn through wind/rain for ca. 10–15 seconds)
- ☐ Lighter (gas) + ferro rod as backup
- ☐ Tinder: waxed cotton or birch bark
- ☐ Silica gel pouch against moisture

8. Did you know?

- The non-toxic sesquisulfide compound (1898) restored the reputation of match factories — before that they were notorious for white phosphorus ("phossy jaw" among workers).
- The **US Postal Service bans shipping** strike anywhere matches (Class 4: flammable solids) — buy them at a hardware store.
- On planes: matches belong in **checked baggage**, not carry-on.

- Quality varies: newer brands use less compound on the head — older boxes ignite noticeably more reliably.



More info: [Pack a Bug Out Bag](#) | [Off-grid power](#)



Sources: [Wikipedia: Match](#) | [Wikipedia \(DE\): Streichholz](#) | [Offline archive](#)

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Stock First Aid Kit Optimally

From standard set to disaster first aid kit



In a disaster, no doctor can come. A well-stocked first aid kit is vital
– and must contain much more than the standard DIN set.

1. The Disaster First Aid Kit (extended)

The normal DIN-13169 set is enough for everyday accidents. For disaster cases you need **significantly more**.

1.1 Wound Care (quantity for 2-4 weeks)

- **Sterile wound compresses:** 5x 10x10cm, 5x 5x5cm, 2x large format (20x20)
- **Bandage packs:** 10 pieces (various sizes)
- **Plaster set:** 50x waterproof, 20x large (knee/elbow), 10x finger bandage
- **Leukoplast / adhesive plaster:** 2 rolls (2cm and 5cm wide)
- **Elastic bandage:** 2x 6cm, 2x 10cm (for joints, pressure bandages)
- **Triangular cloth / triangular bandage:** 2 pieces (sling, splint, emergency bandage)

1.2 Disinfection & Medications

- **Octenisept / Betadine:** 2 bottles (wound disinfection)
- **Disinfection wipes:** 50 pieces (hands, instruments)
- **Painkillers:** Ibuprofen 400mg (2 packs), Paracetamol 500mg (2 packs)
- **ASA (Aspirin):** 1 pack (heart attack EMERGENCY! Chew if suspected)
- **Antihistamine:** Cetirizine or Loratadine (bee sting, allergies)
- **Imodium / Loperamide:** Diarrhea stopper (dehydrates quickly!)
- **Electrolyte powder:** For fluid intake during diarrhea/vomiting

1.3 Special Equipment

- **Resuscitation mask / breathing cloth:** For mouth-to-mouth resuscitation
- **Emergency blanket (rescue blanket):** 2 pieces (gold/silver, heat retention)
- **Cold instant compress:** 2 pieces (bruises, swellings)
- **Tick tweezers / tick card:** Tick diseases are dangerous
- **Eye immediate rinse:** Eye wash bottle (chemicals, dust)
- **Charcoal tablets (Carbo medicinalis):** For poisoning/overdose
- **Thermometer:** Measure fever (digital + analog as backup)
- **Blood pressure monitor:** Optional, but useful

1.4 Instruments & Aids

- **Disposable gloves (Nitrile):** 20 pairs (infection protection!)
- **Scissors:** Bandage scissors (blunt/sharp), small household scissors
- **Tweezers:** Pointed and flat (splinters, ticks)
- **Scalpel or sharp knife:** Only for first aiders with experience
- **Sewing material:** Needles, thread, wound closure strips (Steri-Strips)
- **Adhesive tape (Duct Tape):** Versatile (splint, bandage, repair)
- **Gauze bandage / gauze strips:** 5 rolls

2. Storage & Shelf Life

Item	Shelf Life	Storage
Sterile compresses	5 years	Dry, dark, <25°C
Plasters	3-5 years	Cool, protect from moisture
Medications	2-3 years	Dry, child-safe
Disinfectants	3 years	Protect from light
Gloves	5 years	Protect from sun/heat

3. Checklist: First Aid Kit

☐ Wound compresses (sterile, various sizes)

☐ Bandage packs & plasters (waterproof, large format)

☐ Elastic bandages & triangular cloths

☐ Disinfectant (Octenisept)

☐ Painkillers (Ibuprofen, Paracetamol, ASA)

☐ Antihistamine & diarrhea medicine

☐ Rescue blanket (2x)

☐ Disposable gloves (20x Nitrile)

☐ Scissors, tweezers, thermometer

☐ Notepad + pen (document symptoms)

 More info: [First Aid: The Basics](#) | [Wikipedia: First Aid](#)

 Sources: [Wikipedia: First Aid](#) | [Wikipedia: First Aid Kit](#)

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Weapons & Tools for Defense

Legal framework, legal means, prevention – protection in Germany



Weapon ownership in Germany is strictly regulated. Illegal weapons are punishable and increase risk. The best protection is community, not armament. This article informs about legal options – not instructions for obtaining illegal weapons.

1. Legal Framework (Germany)

- **Weapons Act (WaffG):** Carrying and possessing weapons generally prohibited (without permit)
- **Small weapons license:** Allows **blank/irritant weapons** to be carried (pepper spray guns, blank guns)
- **Weapons license:** Only with proven threat (expertise, need, reliability)
- **Prohibited:** Knives, batons, firearms without license. High penalties!
- **Self-defense:** Weapons may only be used against **current, life-threatening** attacks.

2. Legal Defense Means

Means	Legal?	Effect	Range
Pepper spray	✓ Yes (as defense spray)	Respiratory irritation, temporary blindness	3-5 meters
Pepper spray gun (small weapons license)	✓ Yes	Like spray, more precise	5-8 meters
Blank gun (small weapons license)	✓ Yes	Noise disorientation	Acoustic (no projectile)
Taser	✗ Prohibited (PTB approval needed, practically unreachable)	-	-
Knife (tactical)	✗ Prohibited (carrying prohibited)	-	-
Batons	✗ Prohibited	-	-
Flashlight (1000+ lumens)	✓ Yes (tool)	Blinding, disorientation	10-50 meters
Umbrella (sturdy)	✓ Yes (everyday object)	Defense, maintain distance	Close combat
Keychain	✓ Yes	Impact weapon (between fingers)	Close combat

**Deodorant spray
/ Fire
extinguisher**

☒ Yes

Irritation,
disorientation

3-5 meters

3. The Better Protection: Prevention

- **Community:** Neighborhood help, neighborhood watch, shared meals = less attack surface
- **Visual protection:** Don't appear like an attractive target. Dark, quiet, inconspicuous.
- **Communication:** Radio (PMR/CB), signal systems. Quick alarm.
- **Escape route:** Car fueled, Go-Bag ready, exits known.
- **De-escalation:** Words before weapons. De-escalate conflicts early.

4. Checklist: Defense

☐ Pepper spray (legal, at hand, check expiration)

☐ Flashlight 1000+ lumens (tactical, blinding)

☐ Personal alarm / whistle

☐ Neighborhood help organized

☐ Escape route + car always fueled

☐ Self-defense course attended (De-escalation + escape)

☐ Legal situation understood (self-defense, proportionality)

 More info: [Self-Defense Basics](#) | [Secure House](#)

 Sources: [Wikipedia: Gun Law](#)

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Wildfire & Smoke

Escape, protection, smoke – survival in fire



Wildfires spread explosively. A fire can spread faster than a human can run in wind. Smoke is often deadlier than flames.

1. Recognition Signs

- Strong smoke smell, even if fire seems far away
- Orange, red sky, visible flame columns
- Falling ash and charred leaves/hydrogen cyanide in smoke
- Animals fleeing (wildlife, panicked birds)
- Warning apps: NINA, KATWARN – stay activated!

2. Evacuation during Wildfire

- **Wind direction:** Escape **PERPENDICULAR** to wind direction, never directly away or into it!
- **Asphalt:** Stay on asphalted roads/paths (no forest paths!)
- **Water:** Toward river, lake, pond (fire cannot jump water)
- **Car:** Keep engine running (don't turn off!). AC on recirculation. Wet cloths ready.

- **Stay home?** Only if evacuation impossible: close windows/doors, wet cloths on cracks.
- **No caves/gorges:** Hot air rises – valleys become death traps!

3. Protection in Vehicle

- **Don't get out!** Car offers protection from heat and smoke
- **Park:** On open, non-wooded area (parking lot, field)
- **Lights on:** In smoke – lights + hazard lights for other rescuers
- **Recirculation:** AC on recirculation (no outside air with smoke!)
- **Wet cloths:** Hold before mouth/nose (smoke filter)
- **Keep engine running:** Only if tank half full + (in heat: close windows)

4. Avoid Smoke Inhalation

- **Wet cloths:** Cotton cloth, wet cloth before mouth & nose – filters particles, cools air
- **Crawl knee-high:** Smoke rises – air is clearer below
- **Protect eyes:** Goggles/swimming goggles (smoke irritates eyes = blindness!)
- **Breathing:** Shallow breathing, no exertion (oxygen saving)

5. Checklist: Wildfire

☐ Warning apps installed (NINA, KATWARN)

☐ Car: tank always half full

☐ Wet cloths in car and house (smoke protection)

☐ Swimming goggles/protective goggles available

☐ N95 masks (smoke filter, 5+ pieces)

☐ Escape route from forest/residential area planned (perpendicular to wind)

☐ Meeting point outside forest area designated

 More info: [Natural Disasters: Survival Strategies](#) | [Create Evacuation Plan](#)

 Sources: [Wikipedia: Wildfire](#)

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How to Use a Washboard Properly

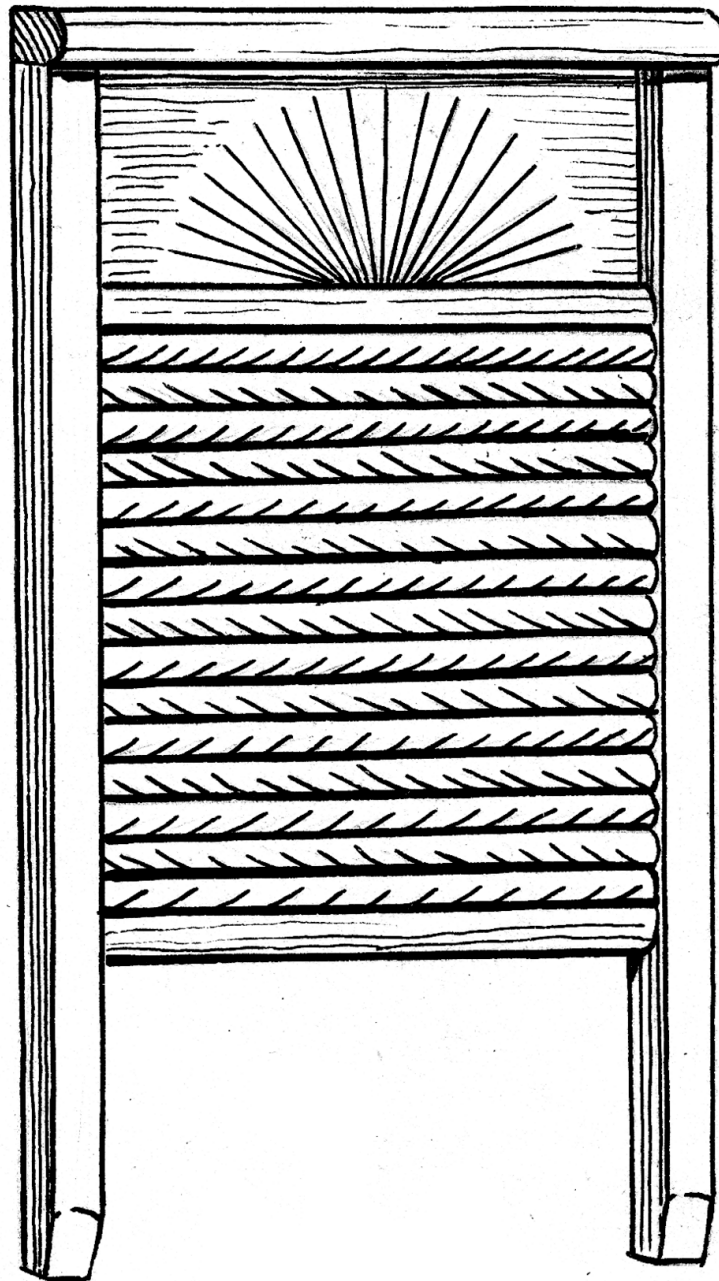
Hand laundry with a washboard, tub and bar soap — the power-free classic



A washboard needs no electricity and very little water. Used correctly it scrubs powerfully yet gently — used wrong it wears out your hands and your fabrics. This guide shows the proper procedure.

1. What is a washboard?

A washboard (also **scrubbing board**) is a tool for hand-washing laundry: a wooden frame holding a **corrugated surface** (the "ribs") — usually galvanized steel, sometimes glass or wood. The common household size is **30–40 cm**. The principle is ancient: fabric is rubbed across the waves so the soapy water flushes through the fibers and lifts out dirt. In **1833** the fluted metal washboard was patented in the USA (Stephen Rust); from the mid-19th century zinc boards dominated, today galvanized steel is standard alongside glass and brass boards.



Washboard schematic (Pearson Scott Foresman, public domain, via Wikimedia Commons)

2. What you need

Item	Purpose	Notes
Washboard	Scrubbing surface	Galvanized steel = standard; glass = gentler, never rusts

2 sturdy tubs/buckets	Wash water + rinse water	10–15 liters each; bathtub/sink also work
Bar/washing soap	Cleaning	Solid — lasts long, no plumbing needed
Clothesline + pegs	Drying	Sun and wind disinfect (UV)
Rubber gloves	Blister protection	Recommended for rough metal and big loads
Brush	Collars/cuffs	For stubborn stains



Glass washboard, early twentieth century (photo: Yannick Trottier, CC BY-SA 3.0, via Wikimedia Commons)
— smoother than metal, never rusts

3. Setting up your wash station

- 1. Angle the washboard:** ribs facing up/out, board leaning against the tub wall, lower end standing in the water.

2. **Fill with water:** tub about $\frac{3}{4}$ full (10–15 liters). Cold works — warm (30–40 °C, e.g. stove or wood burner) dissolves grease much better.
3. **Prepare the soap:** rub bar soap into the water, or rest the soap bar on top of the board (manufacturer tip: keep it ready for direct soaping).
4. **Second container** (rinse water) next to it — water is precious and gets reused.

4. Step by step: getting things clean

1. **Soak:** submerge the laundry fully in the suds (10–15 minutes; longer for heavy soil).
2. **Soap up:** rub the wet garment over the soap bar resting on the board — or apply soap directly to collars, cuffs and stains.
3. **Scrub — the core skill:** fold the garment flat and **move the fabric across the ribs:** up and down, firm, even pressure. **You move the laundry over the board — not the board over the laundry!**
4. **Dirty zones first:** collars, cuffs, armpits, sock heels — treat them first and longest.
5. **Check after 2–3 minutes:** turn the item, run clean areas across too. Work stubborn stains with the brush.
6. **Sort by color:** light items first, dark ones after (prevents dye transfer). Only **2–3 pieces** per wash batch.
7. **Rinse:** move the item to the rinse tub, squeeze, turn — until the water stays clear. If it foams: change to a second rinse.
8. **Wring & hang:** twist/press hard, hang immediately. Sun and wind dry and disinfect.



Classic technique: board angled in the tub, laundry rubbed across the ribs (historical FSA photo, c. 1935, public domain, via Wikimedia Commons)

☀️ **Free disinfection from the sun:** Drying laundry in **direct sunlight** offers extra protection against bacteria: **UV light is germicidal** and significantly reduces bacteria, yeasts and mites on the fabric. Sun exposure plus thorough drying work better together than either alone: **2-3 hours of direct sun per side** is ideal. Note: dark fabrics fade; dry wool in the shade (turn inside out).

5. Technique tips: problems & solutions

Problem	Solution
Blisters / rough hands	Wear rubber gloves or use a glass washboard; keep pressure steady instead of jerky
Wool & silk	Do not scrub! It felts. Squeeze and press cold instead
Grey tint	Warmer water, enough soap, second rinse — don't overload the batch
Water gets dirty fast	Wash heavily soiled items separately; change the suds as soon as visibly dirty
Rust on the metal	Dry after every use; choose galvanized steel or glass
Board slips	Brace the lower end against the tub wall or put it on a cloth

6. Water & energy balance

Method	Water	Power	Notes
Washboard (hand wash)	approx. 10–20 liters	0 kWh	Works anywhere: tub, basin, river
Washing machine (40 °C)	40–60 liters	approx. 0.5–1 kWh	Needs mains power — costly off-grid

More advantages: a cared-for washboard lasts **decades**, needs no spare parts, is easy to transport (hiking, camping, evacuation) — and the principle works **at any river or pond**, with or without soap. Military personnel still use washboards wherever no laundry facility exists.

7. Caring for your washboard

- **Rinse and dry** after every use — damp metal rusts, wood swells
- Store upright and dry, never sealed inside a wet bucket
- Glass boards: check for cracks before use
- Oil the wooden frame occasionally (keeps the wood sealed)

8. Checklist: emergency wash set

☐ Washboard (galvanized steel or glass)

☐ 2 sturdy tubs/buckets (wash + rinse)

☐ Bar or washing soap (several bars — stores almost indefinitely)

☐ Clothesline + 20 pegs

☐ Brush for collars and cuffs

☐ Rubber gloves

☐ Microfiber towel (quick-drying)

9. Did you know?

- For over a century the washboard was **the main laundry tool** — and in many regions of the world without washing machines it is still used daily.
- As a **musical instrument** it became famous: Zydeco bands (Louisiana) strap it to the chest, classic-jazz players laid it on a table, skiffle bands on their knees.
- Military personnel still use washboards where no laundry facility exists.
- The term "washboard abs" comes from the ribs of the board. 😊



More info: [Wash Without Running Water](#) | [Emergency Water Supply](#)



Sources: [Wikipedia: Washboard \(laundry\)](#) | [Wikipedia \(DE\): Waschbrett](#) | [Offline archive](#)

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Wash Without Running Water

Cat wash, dry shampoo, hand washing – cleanliness in emergency



Hygiene prevents disease. Without running water you can still keep clean – with the right methods.

1. The Cat Wash Principle

Maximum cleanliness with little water:

1. **1-2 liters warm water** in bowl/deep cup
2. **Washcloth** made of microfiber or cotton
3. **Body part by body part:** Face, neck, arms, armpits, chest, back, legs, feet
4. **Soap sparingly:** Liquid soap diluted, solid soap lasts longer
5. **Save water:** Not under shower – pot washing!

2. Alternatives to Water

Method	Water consumption	Effectiveness	Notes
--------	-------------------	---------------	-------

Wet wipes	0 liters	Good	Buy biodegradable, store 50+ pieces
Dry shampoo	0 liters	Hair	Powder on head, massage in, brush out
Sanitizer gel	0 liters	Hands	Alcohol-based, 70%+
Shake out clothes	0 liters	Medium	Removes dust/dirt, sun dry
Sand/cleaning cloths	0 liters	Fat/hands	Dry sand + oil removes dirt, then shake off

3. Wash Hair Without Water

- **Dry shampoo:** Powder on hair roots, let work 5 minutes, brush out
- **Starch/baby powder:** Natural alternative, absorbs fat
- **Vinegar rinse:** 1 tbsp vinegar in 1L water – removes fat, shiny
- **Beer:** Old beer as rinse (yeast nourishes hair)
- **Short hair:** In preparation for crises: cut hair short (less care)

4. Wash Laundry Without Machine

- **Hand wash:** 5L water + soap, knead, wring out, dry
- **Clothesline:** Sun dries and disinfects (UV radiation)
- **Plump bag:** Laundry + soap + water in waterproof bag, hang and shake
- **Change less:** Underwear daily, pants/vest every 3-5 days (if not sweaty)

- **Air out:** Shake out clothes, air out, sun – reduces washing need

5. Checklist: Hygiene Without Water

☐ Wet wipes (biodegradable, 100+ pieces)

☐ Solid soap (lasts longer, no water needed)

☐ Dry shampoo or baby powder

☐ Microfiber washcloths (quick drying)

☐ Sanitizer gel (70%+ alcohol)

☐ Toothbrush + toothpaste (or baking soda as substitute)

☐ Towels (quick drying, microfiber)

☐ Clothesline + clothespins



More info: [Build Emergency Toilet](#) | [Safely Dispose Waste](#)



Sources: [Wikipedia: Hygiene](#)

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Filter & Purify Water

From dirty water to drinking water – methods, filters and disinfection



Critical: Dirty water can cause deadly diseases (cholera, typhus, diarrhea). Filtering alone is not enough – always disinfect!

1. Why Filter Water?

Even clear water can contain dangerous bacteria, viruses, parasites (e.g. Giardia) and chemicals. In disaster, water supply is often contaminated. A reliable filter is vital.

2. Filter Methods Overview

Method	Removes	Advantages	Disadvantages
Candle filter (ceramic)	Bacteria, protozoa	Reusable, long-lasting	Not viruses, slow
Activated carbon	Chemicals, odor, chlorine	Improves taste	Not germs

Membrane filter (0.1µm)	Bacteria, protozoa	Effective, compact	Some viruses not, clogs
Improvised filter	Coarse particles	From natural materials	Doesn't remove germs
UV light	Bacteria, viruses	No chemicals	Battery/sun needed, turbidity disturbs
Boiling	All microorganisms	100% effective	Energy needed, chemicals remain

3. The Improvised Water Filter

When no commercial filter is available, build a multi-layer filter:

1. **Top:** Coarse sieve / cloth (removes leaves, insects)
2. **Layer 1:** Coarse gravel / small stones (5-10mm)
3. **Layer 2:** Fine sand (1-2mm) – removes mud
4. **Layer 3:** Activated carbon (from campfire! ground) – removes chemicals
5. **Layer 4:** Fine sand – polishes water
6. **Layer 5:** Cotton/cloth – holds back fine particles
7. **Outlet:** Hole in bottom, collect water

 The improvised filter removes **NO viruses and few bacteria!** Always subsequently **boil** or treat with chlorine tablets.

4. Disinfect Water

4.1 Boiling (best method)

- Boil water vigorously for 1 minute (3 minutes at altitudes >2000m)
- Leave lid on until water cools (prevents recontamination)
- Kills bacteria, viruses, parasites, eggs

4.2 Chlorine tablets

- 1 tablet per 20-25 liters (depending on manufacturer)
- Let work for 30 minutes
- Chlorine odor is normal – indicates effectiveness

4.3 Bleach solution (emergency)

- Unscented bleach (4-6% sodium hypochlorite)
- 2 drops per liter clear water, 4 drops per liter turbid water
- Let work for 30 minutes
- Slight chlorine odor after 30 min = successful

4.4 SODIS (Solar disinfection)

- Fill clear PET bottles with clear water
- Lay in direct sun for 6 hours (2 days with clouds)
- UV radiation kills microorganisms
- Only for clear water, not turbid!

5. Which Water Sources Are Safe?

Source	Safety	Measures
Rainwater (fresh)	Relatively safe	Filter + boiling recommended

Spring water	Often safe	Filter, then test
River/stream	Risky	Always filter + boil
Lake/pond	Risky	Always filter + boil
Well (private)	Mostly safe	Regular testing
Tap water (blackout)	Varies	Boil if uncertain

6. Checklist: Water Treatment

☐ Candle filter or membrane filter (0.1-0.2µm)

☐ Chlorine tablets or bleach solution

☐ Cooking option (camping stove, gas, wood)

☐ Clear PET bottles for SODIS

☐ Coffee filter / clean cloths as pre-filter

☐ Activated carbon (for chemicals)

☐ pH test strips (optional)



More info: [Water Supply in Emergency](#) | [Wikipedia: Water Treatment](#)

 Sources: [Wikipedia: Water Treatment](#) | [Wikipedia: Drinking Water](#)

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Long-Term Water Storage

Store drinking water safely for years — containers, treatment and rotation



Without water a human survives only 3 days. Per person and day you need **3 liters** (drinking + cooking) plus 10–20 liters for hygiene. A 4-person household needs at least **56 liters per week** — for drinking alone.

1. How much water to store?

Period	Drinking water (4 pers.)	+ Hygiene/sanitation	Total
3 days	36 L	120–240 L	156–276 L
2 weeks	84 L	280–560 L	364–644 L
1 month	180 L	600–1.200 L	780–1.380 L

Federal Office of Civil Protection (BBK) recommends: **at least 14 days** of stock — with space constraints at least 3 days.

2. The right containers

Container	Advantages	Disadvantages
PET bottles (food grade)	Cheap, stackable, leak-proof	Only 6–12 months, light damage, not reusable for long-term storage
HDPE canisters (blue, 10–25 L)	Food-grade, dark, stackable, lasts years	Heavy when full (25 kg), small opening
IBC containers (1,000 L)	Very large quantities	Heavy, space, outdoor only (UV protection needed)
Glass bottles	Unlimited shelf life, no plastic leaching	Fragile, heavy, expensive
Water tank (steel/plastic, fixed)	Large quantities, often with tap	Expensive, not portable, needs space

Important: Only containers with food-grade approval (PE-HD recycling code 2, HDPE) or glass. Never milk/juice bottles (residues), never unmarked canisters (plasticizers/chemicals).

3. Filling: tap water suffices

- **Fill tap water directly** into clean HDPE canisters — no boiling needed (utility chlorination protects initially)
- **Don't fill completely** (leave 2–3 cm of air — for frost safety + chlorine distribution)
- **Seal tightly**, label with date (filling) + contents
- **Store dark and cool** (cellar, pantry) — UV promotes algae and bacterial growth

- **Separate from chemicals:** No contact with petrol, solvents, paints (vapours diffuse through plastic!)

4. Shelf life & rotation

Storage type	Shelf life	Rotation
PET bottles (untreated)	6–12 months	Drink and refill
HDPE canisters (tap water)	12–24 months	Check every 6–12 months + treat if needed
With preservative (see below)	5+ years	Rotation not needed, but check water
Chlorine/hypochlorite treated (see below)	5+ years	Rotation not needed

Keep rotation simple: At your next water bill, drink the stock or use it for plants and refill fresh. A calendar reminder (phone) suffices.

5. Preservation: making water last

Method A — chlorination (recommended):

- Per 1,000 L of water: **4–8 ml of unscented 12 % sodium hypochlorite solution** (unscented bleach) — or ca. 1 heaped tablespoon per 100 L
- Target: **0.2–0.5 mg/L free chlorine** in the water (slight smell, not stinky)
- Stir, let stand 24 hours, then seal container tightly
- Chlorine decomposes slowly — preserves the water against bacteria and algae for years

Method B — silver ions / special preparations:

- Commercial **water preservation tablets** (e.g. Micropur Classic) — dose according to package instructions
- Silver ions inhibit bacterial growth for years — no chlorine taste
- More expensive than chlorination, but taste-neutral

6. Treating water before use

Stored water is **not always drinkable as-is** — depending on storage duration and conditions:

1. **Smell + look:** Cloudy, smelly or algae? Treat first!
2. **Boil** (1–3 min rolling boil) — most reliable method
3. **Chlorinate** (as above) — if boiling is not possible
4. **Filter** (drinking water filter, e.g. activated carbon + membrane) — for cloudy water or taste problems

7. Rainwater & other sources (supplement, not replacement)

- **Collect rainwater** (gutter → tank) — for hygiene use (toilet, washing), not directly drinkable
- **Make drinkable:** filter + boil or chlorinate
- **Water boiler/heating reserve:** The storage tank of the hot water boiler contains 50–200 L of drinking water — drain in emergency
- **Toilet cistern** (without chemical additives!): 5–9 L of drinking water per cistern

8. Checklist: water storage

☐ HDPE canisters (2× 25 L per person, food grade)

☐ PET bottles as short-term reserve (6–12 months)

☐ IBC tank or fixed tank (optional, large quantities)

☐ Sodium hypochlorite (12 %, unscented) or Micropur tablets

☐ Labels + marker (filling date)

☐ Drinking water filter + spare filter

☐ Pot for boiling (gas/wood stove capable)

☐ Dark, cool storage location (cellar/pantry)

9. Did you know?

- The **BBK (Federal Office of Civil Protection)** recommends 3 L of drinking water + 3.5 L of household water per person/day — most households have no stock.
- In **disaster exercises**, water shortage is the most common critical point — without water, sanitation, hygiene and nutrition fail.
- Water from the **hot water boiler** and the **toilet cistern** is available in most apartments and can be used immediately in an emergency.



More info: [Emergency water supply](#) | [Filter & purify water](#)

 Sources: [Wikipedia: Emergency water storage](#) | [Offline archive](#)

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Water Supply in Emergency

At least 3 liters per person per day



Critical: After 3 days without water, performance drops drastically. After 5-7 days survival is endangered. Water has absolute priority!

1. Calculate Minimum Supply

People	3 Days	14 Days	30 Days
1	9 Liters	42 Liters	90 Liters
2	18 Liters	84 Liters	180 Liters
4	36 Liters	168 Liters	360 Liters

Note: This is the *survival minimum* (drinking + hygiene). For comfort (showering, washing) you need 20-50 liters per person/day.

2. Store Water

- **Drink crates:** 1.5L bottles are ideal (stackable, easy to transport)
- **Water canisters:** 10L or 20L (garden market, camping store)

- **Rain barrel:** At least 200L, covered, dark storage
- **Bathtub:** Fill it *before* blackout (approx. 150-200L)
- **Water heater:** 80-150L additional (boil before drinking!)

3. Water Shelf Life

Storage Type	Shelf Life	Notes
Purchased water (sealed)	2-5 years	Dark, cool (<15°C)
Self-filled	6-12 months	Boil + chlorine/silver ions
Rainwater	Unlimited	But: Filter + boil needed
Tap water (bottled)	6 months	Screw cap, not plastic bottles

4. Drinking Water from Unknown Sources

Always filter + disinfect!

4.1 Filter (removes particles)

1. **Coffee filter/cloths:** Coarse particles (mud, leaves)
2. **Commercial water filter:** Microorganisms (0.1-5 micrometers)
3. **Ceramic candle filter:** Bacteria (0.2 micrometers) - very reliable!
4. **Improvised filters:** Layers of charcoal (campfire!), sand, gravel, cotton/cloth

4.2 Disinfect (kills germs)

Method	Duration	Amount (per liter)	Effectiveness
Boiling	1-3 minutes	-	99.9% (best method!)
Chlorine tablets	30 minutes	1 tab/20L	99%
Bleach (4%)	30-60 min	2 drops/L	99%
Iodine (2% solution)	30 min	5 drops/L	99%
UV light (sun)	6 hours	-	90-95%
Silver ions (colloidal silver)	2-4 hours	1-2 drops/L	85-95%

 **Important:** *Combine* filter + disinfection! Filtering alone removes no viruses. Boiling alone removes no chemicals.

5. Alternative Water Sources in House

- **Toilet tank:** 5-10L (upper flush, not lower!)
- **Water heater:** 80-150L (turn off before removal!)
- **Heating water:** Only for hygiene (contains chemicals!)
- **Washing machine:** Remaining water in hose and drum
- **Plant saucers:** Emergency only

6. Checklist: Water Supply

- ☐ 3 liters drinking water/person/day (minimum)
- ☐ Water filter (ceramic/candle filter recommended)
- ☐ Disinfectant (chlorine tabs, bleach, or cooking option)
- ☐ Rain barrel/water barrel (min. 200L)
- ☐ Drinking water hose (never used for garden/heating!)
- ☐ Water canisters (10-20L, stackable)
- ☐ Silver foil/aluminum foil (protect water from light)



More info: [Filter & Purify Water \(Detailed Guide\)](#)



Archived: [BBK: Water Supply](#) | [Wikipedia: Water Treatment](#)

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Making Your Own Hydrogen: Produce, Store, Use

DIY electrolysis, storage and honest limits — hydrogen as a seasonal storage



Oxyhydrogen danger! A mixture of hydrogen and oxygen explodes at the smallest ignition source. Produce and store hydrogen OUTDOORS only, never indoors, and never mix H_2 and O_2 in one container. Compression needs certified bottles — no DIY solutions.

1. What hydrogen can do — and what it can't

Hydrogen is an **energy carrier, not an energy source**: you must first make it with electricity. The chain *electricity* → *electrolysis* → *storage* → *fuel cell/power* achieves an overall efficiency of only **approx. 25–40 %** — a battery achieves 90 %. Hydrogen therefore makes sense as a **seasonal and long-term storage** (summer surplus → winter), at larger quantities, or when you need chemically bound fuel (e.g. for engines). For daily backup power, batteries are the better choice.

2. Production: DIY electrolysis

In electrolysis, water is electrically split into **hydrogen (cathode, –)** and **oxygen (anode, +)**. For DIY:

- **Container + divider**: collect H_2 and O_2 at separate electrodes — never mix the gases (oxyhydrogen!)
- **Electrodes**: stainless steel (V2A) works; nickel/platinum coated is more efficient

- **Electrolyte:** potassium hydroxide solution (KOH, ca. 20–30 %) conducts well.
Never use table salt: it produces poisonous chlorine gas!
- **Power source:** 12–24 V DC, a solar panel with charge controller suffices for small amounts

Honest quantities: 1 kWh of electricity yields only ca. **150–200 liters of hydrogen** (standard volume, ca. 13–18 g). 1 kg of H₂ stores around 33 kWh of chemical energy — that requires ca. 50–60 kWh of electricity. Small electrolyzers deliver liters per minute, not cubic meters per hour.

3. Storage: the hardest step

Hydrogen is the smallest molecule and diffuses through many materials (metal **embrittlement**, plastic permeability). Realistic options:

Method	Advantage	Disadvantage
Low-pressure storage (gas bag, flushed container via water seal)	Self-buildable, safe (low pressure)	Huge volume: 1 kg H ₂ ≈ 11,000 liters!
Metal hydride cartridges	Compact, safe (low pressure)	Expensive, limited capacity
Steel bottles (200 bar)	Compact, professional	Certified bottles + filling system only — no DIY!

4. Use: what to do with the gas?

- **Fuel cell:** delivers electricity directly again (efficiency ca. 50 %) — expensive for continuous operation, but silent. Small air-cooled stacks from ca. 100 W available.
- **Engine/generator:** petrol generators run on adapted mixture (H₂ has different ignition/combustion properties, output drops ~15–20 %). Modifications = warranty loss, expertise required.

- **Cooking/heating:** technically possible, but flames are **almost invisible** — too risky indoors.

5. Safety: the five iron rules

1. **Outdoors only** — produce, store and use, never in cellars, tents or living rooms.
2. **Keep gases separate:** never collect H_2 and O_2 in one container (oxyhydrogen 2:1!).
3. **Ban ignition sources:** hydrogen needs extremely little ignition energy — static electricity suffices. Ignition range 4–77 vol.-% (wider than methane!).
4. **Prevent flashback:** flame arrestor / water seal between electrolyser and storage.
5. **Hydrogen does NOT smell:** without a detector you won't notice leaks — gas detector or soapy-water test on connections.

6. Checklist: hydrogen micro-setup

☐ Electrolysis cell with separate gas outlets (H_2/O_2)

☐ KOH electrolyte (20–30 %) + refill with distilled water

☐ Solar panel + DC source (12–24 V)

☐ Flame arrestor + water seal before the storage

☐ Low-pressure gas bag outdoors

☐ Gas detector (H_2 sensor) for the test area

☐ Fuel cell or adapted generator for use

7. Did you know?

- 1 kg of hydrogen contains as much energy as ca. **3 liters of petrol** — but needs around 11,000 liters of volume at normal pressure.
- Island grids with hydrogen storage exist, e.g. on remote islands: summer solar surplus is stored and converted to electricity in winter.
- Hydrogen metal embrittlement destroys unsuitable steel pipes — V2A stainless steel or special composite lines are mandatory.



More info: [Store electricity — island solution](#) | [Build your own wind turbine](#)



Sources: [Wikipedia: Hydrogen](#) | [Wikipedia: Electrolysis of water](#) | [Offline archive](#)

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Edible Wild Plants

Gather food from nature – safe and sustainable



Caution: Never eat a plant you cannot identify 100%! Poisonous plants can be deadly. This guide is only for experienced gatherers.

1. Safety Rules for Wild Plants

1. **100% Identification:** Doubt = Discard. Take a photo guide.
2. **Avoid contaminated areas:** Road sides (exhaust fumes), industrial areas, toxic soils
3. **Never gather all:** Max. 1/3 of a plant group so it can regrow
4. **Eat raw?** Many wild plants must be cooked or blanched
5. **Allergy test:** Try small amount, wait 15 minutes

2. Edible Wild Plants (Germany)

Plant	Edible Parts	Season	Notes
Nettle	Leaves, seeds, root	March-Nov	Blanching neutralizes stinging hairs. Use like spinach.

Dandelion	Leaves, flowers, root	Year- round	Young leaves milder. Root roasted as coffee substitute.
Chickweed	Leaves, stems	Year- round	Mild, salad-like. Grows everywhere.
Ground elder	Leaves, young stems	March- June	Like parsley. Don't confuse with hemlock!
Plants from near the meadow	Leaves	Spring	Only young shoots. Bitter substances in older plants.
Plantain	Young leaves	March- Oct	Very nutritious. Raw like salad, cooked like spinach.
White clover / Red clover	Flowers, leaves	May-Sep	Flowers edible raw, leaves cooked. Don't confuse with garden clover!
Dead nettle	Leaves, flowers	March- Oct	Not stinging! Mild-nutty taste.
Wood sorrel	Leaves	Apr-Aug	Sour, vitamin-rich. Use like sauerkraut.
Yarrow	Leaves	May-Oct	Bitter, aromatic. Tea or as spice.
Chestnuts (Sweet chestnut)	Fruits	Sep-Oct	NEVER Horse chestnuts! Sweet chestnuts = sweetish, edible raw.

Acorns (Oak)	Fruits	Sep-Nov	Roasted or flour. Wash out bitter substances!
Hazelnuts, Walnuts	Fruits	Sep-Oct	Nutrient bomb. Store dry.
Mushrooms	Fruit bodies	Sep-Nov	ONLY with 100% certainty! Porcini, Chanterelle, Oyster mushroom are safe.

3. Poisonous Look-alikes (Caution!)

Edible Plant	Poisonous Look-alike	Difference
Ground elder	Water hemlock	Hemlock has smelly root, pinnate leaves
Plantain	Foxglove (Digitalis)	Foxglove has rosette leaves, tall flower spike
Clover	Crown vetch (poisonous)	Crown vetch has finer leaves, yellow flowers
Sweet chestnut	Horse chestnut	Sweet chestnut = pointed, Horse chestnut = round, shiny
Wild garlic	Autumn crocus, Lily of the valley	Wild garlic smells like garlic (crush!)

4. Preparation Tips

- **Blanching:** Nettles, Ground elder, Dandelion briefly in boiling water = milder
- **Soup:** Wild herbs with potatoes, onions, broth puree
- **Salad:** Young leaves raw with oil/vinegar
- **Tea:** Nettle (blood cleansing), Yarrow (digestion), Linden flowers
- **Flour:** Acorns/Acorn flour as grain substitute (wash out bitter substances first)

5. Checklist: Wild Plant Gathering

☐ Identification book/app with photos (offline!)

☐ Gathering basket/cloth (no plastic – sweats)

☐ Gloves (nettles, thorns)

☐ Small knife (clean, cut)

☐ Map with known gathering areas

☐ Never gather more than 1/3 of a group

☐ First test small amount (allergy check)

 More info: [Preserve Food](#) | [Heal with Plants](#)

 Sources: [Wikipedia: Foraging](#) | [Wikipedia: Wild Food](#)

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Build Your Own Wind Turbine

Small wind turbines, Piggott design and honest yield figures — wind as a winter complement to solar



Rotating blades and a toppling mast are life-threatening. Build it stable, check connections regularly and keep people away from running rotors. In a storm: shut down/lock the rotor.

1. When is DIY wind worthwhile?

Wind power grows with the **third power of speed**: double the wind = eight times the power. That is why the **site** decides everything — free height without obstacles (houses and trees massively brake the wind near the ground). Honest expectation: a self-built small wind turbine delivers realistically **50–300 watts** in usable wind — as a **complement to solar in winter** (when PV delivers almost nothing), not as a sole supply. Wind is irregular — but it also blows at night and during snow.



Small garden turbine (photo: CC BY 2.0, via Wikimedia Commons) — free, high site, guyed mast

2. The generator: three options

Option	Advantages	Disadvantages
PMA / permanent-magnet generator	High efficiency, field-proven, charging power even in light wind	Cost (new parts €50–150) or conversion work
Hugh Piggott design	The DIY classic: magnets in rotor plates + hand-wound coils, free plans, proven worldwide	Craftsmanship: winding, balancing, welding/casting
Conversions (car/rail dynamo, washing machine motor)	Cheaply available	Usually need too high RPM or have poor efficiency — only sensible with a gearbox

Important: wind turbines rotate **slowly** (small rotors 200–600 rpm). The generator must already deliver charging voltage at that speed — ordinary dynamos (too fast, too high RPM) do not fit directly.

3. Rotor and blades

- **2–3 blades** cut from PVC pipe (the classic) or made from wooden profiles — 1–2 m diameter for beginners
- **Balancing:** all blades of equal weight and equally adjusted — otherwise vibrations that destroy mast and generator
- **Small rotors spin fast** (200–600 rpm) — choose the generator accordingly
- Overspeed protection: **furling** (side tail turns the rotor out of the wind) or a mechanical brake

4. Mast and site

- **6–12 metre mast**, secured with guy wires (at least 3, 120° angles); foundation depending on the ground
- **Clear exposure:** overtop obstacles within a 100 m radius by up to 10 m — otherwise useless
- **Tilt-up mast** (lowered at the foot) for maintenance — instead of climbing
- **Legal:** small towers are often permit-free under local building codes, but check setback areas (neighbours, property line). Vibrations transfer to the foundation — talk to your neighbours!

5. Electronics: charging, regulating, protecting

- **Charge controller with braking function:** with a full battery the rotor must NOT run unbraked (it breaks) — it needs a "dump load" (load resistor) or a short-circuit brake (Piggott standard)

- **Battery 12/24 V** (see article "Store electricity — island solution")
- **Fuses** between generator, controller and battery + surge protection (lightning!)
— grounding of the mast
- **Inverter** (sine wave) for 230-V appliances

6. Honest yield figures

Wind (m/s)	Typical power (1.2-m rotor, good build)	Hours at this wind
3 (light breeze)	approx. 5–15 W	often
5 (moderate wind)	approx. 40–80 W	regularly
7 (strong wind)	approx. 100–150 W	less often
9 (gale gusts)	approx. 250–400 W (brake active!)	rarely

Realistic daily yield in windy locations: 0.3–1 kWh — enough for lighting, communication, laptop. Wind complements solar (winter, bad weather) — it does not replace it.

7. Checklist: DIY wind turbine

☐ Generator (PMA or Piggott kit) with matching RPM

☐ Rotor balanced + furling/brake

☐ Mast 6–12 m + guys + foundation + grounding

☐ Charge controller with dump load + fuses

☐ Battery + sine-wave inverter

☐ Distance from buildings/property lines + maintenance access

8. Did you know?

- No rotor can harvest more than **59.3 %** of the wind's energy (Betz limit) — reality is 25–45 %.
- The **Piggott design** (after Hugh Piggott) is the DIY world standard — his free plans are put into practice in workshops worldwide, including in developing countries.
- Micro wind turbines (< 5 kW) are usually **permit-free** — still check the local building code.



More info: [Store electricity — island solution](#) | [Make your own hydrogen](#)



Sources: [Wikipedia: Wind turbine](#) | [Wikipedia: Micro wind turbine](#) | [Offline archive](#)

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Suturing Wounds: Emergency Guide

Materials, procedure, suturing techniques and wound care — when no doctor is available



Important: Suturing wounds yourself is a **last resort** for crisis situations when no medical help is reachable. Emergency call (112/911) always comes first! Improperly sutured wounds can cause infections, scars and permanent damage. When in doubt: irrigate, dress and use closure alternatives (Steri-Strips, wound glue) instead.

1. When to suture — and when not to

A suture is worthwhile when a wound **gapes** and would otherwise heal poorly or with heavy scarring. Ideal candidates are fresh, clean-edged cuts.

Good candidates

- Fresh, clean wounds (less than **6–8 hours** old)
- Clean, gaping cuts (e.g. knife or glass injuries) with bleeding under control
- Wounds on the **face** (within 24 hours, cosmetically important)
- Long tear/cut wounds on arms, legs and scalp (except the jaw)

Do NOT suture (treat the wound open!)

⚠ Keep your hands off the needle with: puncture and **bite wounds**, heavily soiled wounds, wounds containing foreign bodies, **infected** wounds (redness, pus, warmth), gunshot wounds, wounds older than 12 hours (exception: face up to 24 h), visible organs or fat from the abdomen or chest, and wounds with visible tendons, joints or bone. These wounds must be treated open and seen by a doctor — suturing seals germs inside!

Gentle alternative first: pull the wound edges together with Steri-Strips (adhesive strips) or wound glue. This is less invasive, painless, needs no needles — and is entirely sufficient for many shallow wounds. Suturing is only necessary when the edges will not stay together otherwise.

2. Materials: The suture kit

Material	Purpose	Note
Suture material (thread + needle)	Wound closure	Monofilament threads (nylon/prolene) for skin; sizes 4-0/3-0 (body), 5-0/6-0 (face)
Needle holder	Hold & guide the needle	In an emergency fine forceps work, but far worse
2 forceps (smooth/surgical)	Grip wound edges	Not toothed (traumatizes tissue)
Scissors (blunt/sharp)	Cut threads, trim dressings	A separate thread scissors is ideal

Sterile gloves	Infection control	Nitrile, 2 pairs
Disinfectant	Skin & wound	Octenidine or povidone-iodine; alcohol or hydrogen peroxide NEVER into the wound!
Sterile gauze, roll bandages	Irrigation & dressing	Several packs
Saline (0.9 %) or clean water	Wound irrigation	Boiled drinking water suffices in emergencies
Syringe (20 ml) or wound irrigator	Pressurized irrigation	Pressure flushing removes debris from the depth
Local anesthetic (if available)	Pain reduction	Lidocaine 1 %, syringe + needle — without it suturing is very painful
Face mask, cap, headlamp	Sterility & visibility	Good lighting is half the work

Understanding suture material

- **Non-absorbable** (nylon, prolene, silk): threads must be removed later. Standard for skin sutures.
- **Absorbable** (vicryl, PGA): dissolves by itself (weeks to months). Practical when follow-up is unreliable, inside the body and for children.
- **Monofilament** (smooth thread): glides well, little germ adhesion — preferred for skin sutures.
- **Needles:** curved, **cutting** needles for skin (pierce the tough skin), **round-bodied** needles for soft tissue.
- **Size rule:** as fine as possible, as strong as necessary — face 6-0/5-0, hand 5-0, arms/legs 4-0/3-0, scalp/torso 3-0.

Improvised alternatives

- **Steri-Strips / wide tape:** pull wound edges together, apply across the wound
- **Wound glue:** medical tissue adhesive (cyanoacrylate) on degreased, dry, joined edges — never into the depth of the wound!
- **Skin stapler:** fast but crude — practical for scalp and high-stress areas
- **Nylon fishing line + curved needle** (from boiled tools): last resort, only if nothing else exists — mind sterility!

Checklist: Emergency suture kit

☐ 2–3 suture packs (3-0 + 4-0 nylon/monofilament, with needle)

☐ Needle holder, 2 forceps, scissors

☐ Sterile gloves (2 pairs), face mask

☐ Disinfectant (octenidine/povidone-iodine) + sterile gauze

☐ Saline/wound irrigation + 20 ml syringe

☐ Steri-Strips, wound glue, plasters, roll bandages

☐ Headlamp + spare light

☐ Painkillers (ibuprofen/paracetamol)

☐ Notepad + pen (wound diary)

3. Preparation: hygiene comes first

 **The wound infection starts with the preparation.** Cleanliness matters more than the perfect stitch!

1. **Wash** and disinfect hands, put on **sterile gloves** (change after touching non-sterile surfaces!)
2. **Irrigate the wound:** flush generously with saline or boiled, lukewarm water under pressure (at least 300–500 ml) until no debris is visible
3. **Disinfect:** wound edge and surroundings generously with octenidine/povidone-iodine; let the wound surface dry briefly
4. **Foreign bodies:** remove loose particles with sterile forceps. **Do NOT pull out deeply embedded objects!** (can trigger fatal bleeding)
5. **Trim:** shorten surrounding hair with scissors — **never shave** (micro-injuries = germ bridges)
6. **Hemostasis:** press directly on the wound for 2–3 minutes until dry. Small spurting vessels: press with a sterile pad
7. **Pain relief:** if lidocaine is available: inject 1–2 ml under the wound edge on each side, wait 3–5 minutes
8. **Position & light:** lay the patient down (circulation), illuminate the wound well (headlamp), helper for materials and distraction

4. Procedure: step by step

4.1 Align the wound edges

The wound edges must lie together **without tension and without shifting** — like a broken object assembled exactly. Misalignments (e.g. along skin lines, eyebrows, lip border) lead to visible scars.

4.2 The halving method

1. **First stitch in the middle of the wound** — divides the wound into two halves

2. Next stitches always **in the middle of the remaining segments** (middle left, middle right ...)
3. This distributes any edge inequality evenly across segments instead of "tipping" at one end

4.3 Distances

Region	Distance stitch–wound edge	Distance stitch–stitch
Face	2–3 mm	3–5 mm
Hand/fingers	3–5 mm	4–6 mm
Arms, legs	5–10 mm	8–10 mm
Scalp/torso	8–10 mm	10–12 mm

4.4 Technique of a single stitch

1. Insert the needle **perpendicular** (90°) to the skin, about one needle diameter from the wound edge
2. Guide along the needle's curvature through the tissue (do not bend it!)
3. Exit on the opposite side with the **same distance and depth** — the edges must end up level
4. Pull the thread through, tie **3–4 throws**, place the knot **beside** the wound (don't press on the edges!)
5. Tight enough that the edges just touch — **do not strangle** (white, squeezed edges = tissue death)
6. Trim thread ends to 5–10 mm

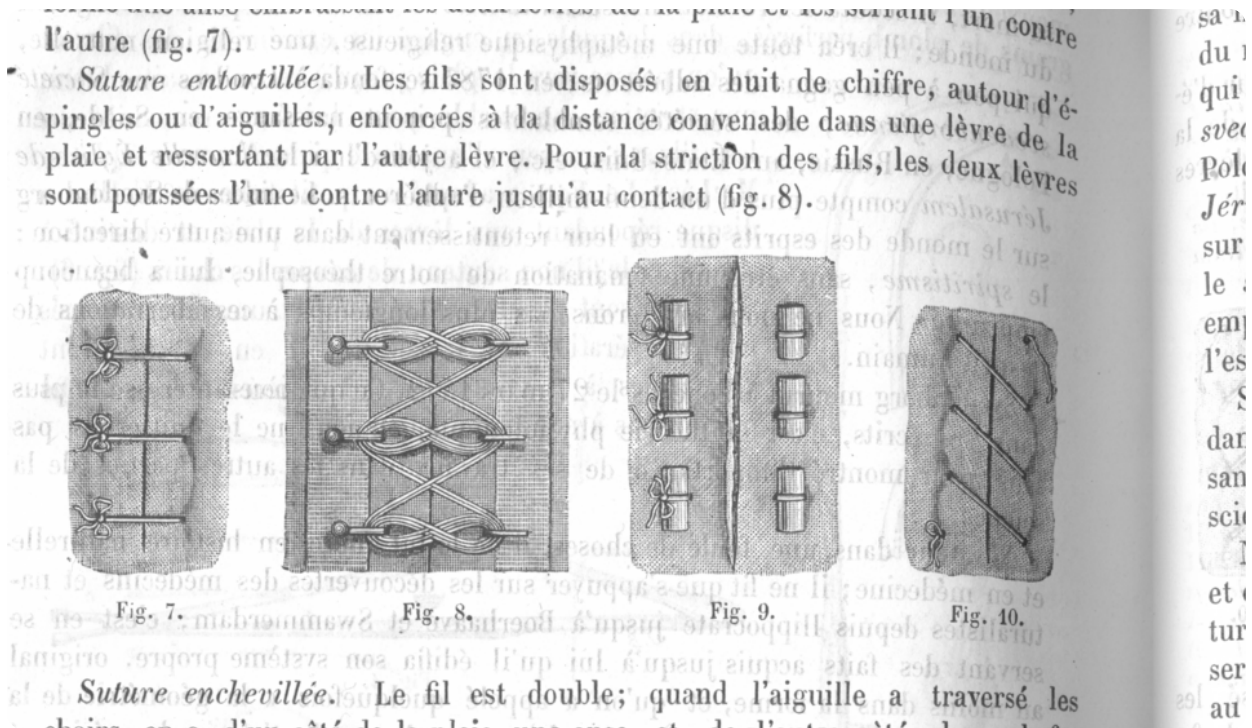
 **Golden rule:** Better one clean, slightly gaping stitch than a tightly strangled one! Tense sutures cut into swollen tissue and leave stepped

scars. After placing: cover the wound antiseptically and **let it rest for 2–3 minutes** — if the edges drift apart (swelling), re-check the stitch.

5. Suturing techniques at a glance

Technique	Use	Advantage	Drawback
Simple interrupted suture (standard)	Almost all wounds	Robust; one loosened stitch doesn't endanger the whole wound	Time-consuming
Continuous suture	Small, clean-edged wounds; scalp	Fast, even tension	If one point slips, the whole suture gapes
Vertical mattress suture	High-tension areas, thick edges (e.g. over joints)	Everts edges, deep tissue anchoring	Needs practice, scar-prone
Horizontal mattress suture	Tension-prone areas, thin edges	Large tissue bite, fast	Tends to strangulate edges
Subcuticular suture	Cosmetic, clean-edged wounds (thread under the skin)	Nearly scar-free	Challenging without practice

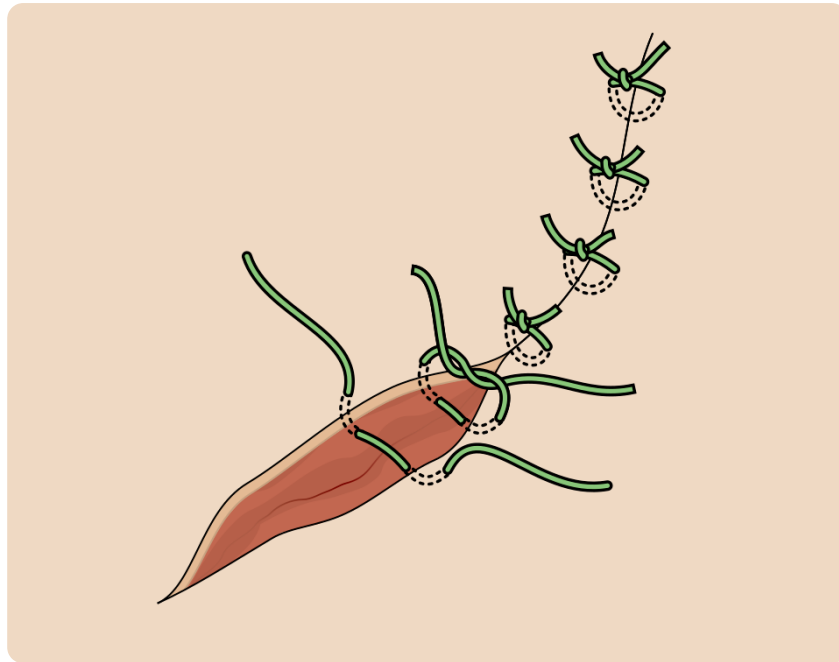
Suturing techniques are ancient — the plate below comes from a medical lexicon of 1884 and shows classic stitch variants, many of which are still in use today:



Historical suture types from the Dictionnaire Encyclopédique des Sciences Médicales (1884) — Public Domain, via Wikimedia Commons

5.1 Simple interrupted suture (the standard technique)

1. Insert the needle perpendicular at the wound edge (approx. 5–10 mm away, depending on region)
2. Pass under the wound base, exit on the opposite side at the same depth
3. Knot: first a **double wrap** (surgeon's knot), then 2–3 simple throws, pulled across
4. Place a new stitch every 5–10 mm until the wound is completely closed



What a finished interrupted suture looks like (diagram) — Image: Olek Remesz, Wikimedia Commons, CC BY-SA 2.5

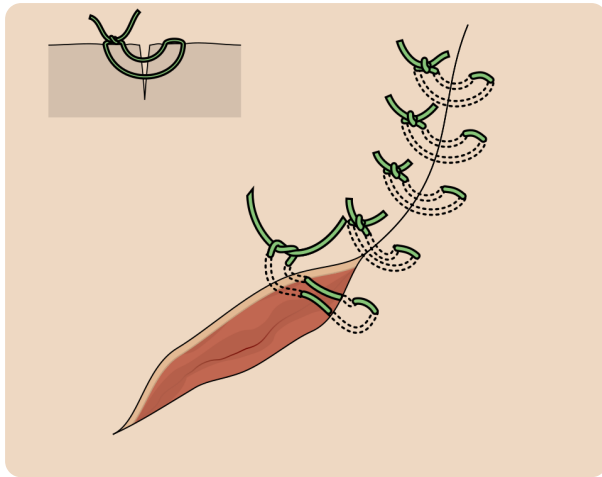
5.2 Continuous suture

Start like an interrupted stitch, then without a knot go diagonally to the opposite side and continue along the wound. Finish with a knot at the last thread end.

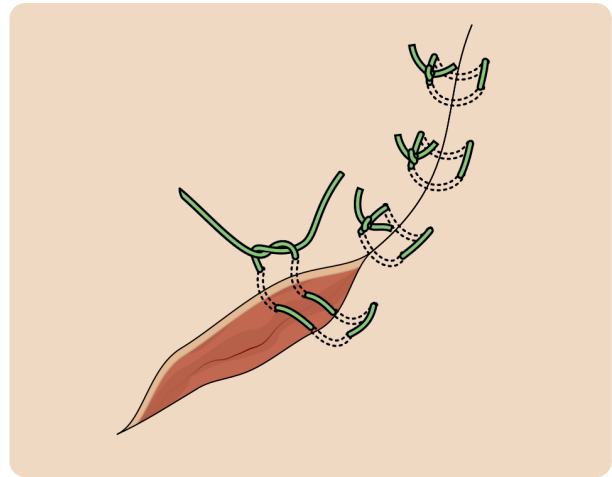
Caution: keep tension even — too tight and the suture cuts in when swelling starts.

5.3 Vertical mattress suture (Donati)

Insert far from the edge (approx. 1 cm), pass deep under the wound base to the opposite side, return on the entry side close to the edge, cross the wound, exit on the far side close to the edge and re-enter far away. Result: edges are everted and anchored deep. Ideal for **high-tension** areas (knee, elbow, back).



Vertical mattress suture — Image: Olek Remesz, Wikimedia Commons, CC BY-SA 2.5

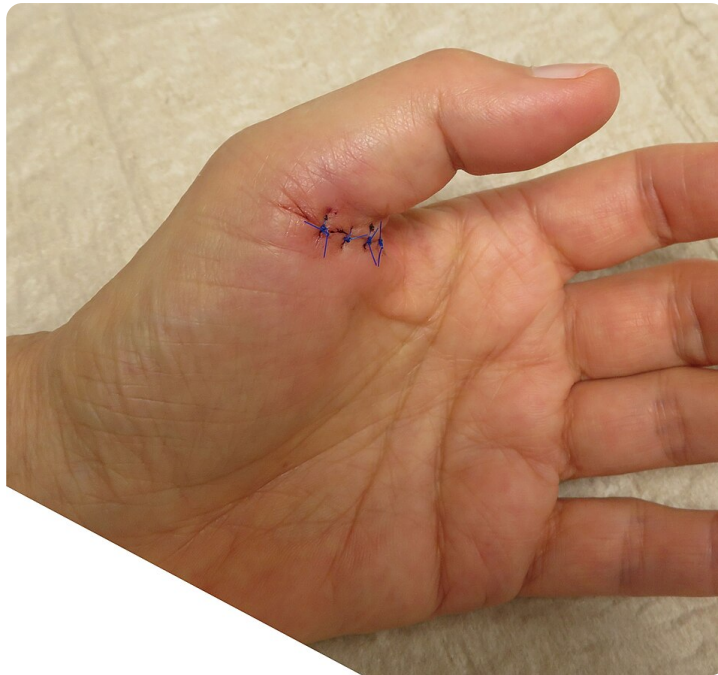


Horizontal mattress suture — Image: Olek Remesz, Wikimedia Commons, CC BY-SA 2.5

6. After suturing: immediate measures

1. **Disinfect** + dry, non-tensioning dressing (gauze + roll bandage, no cotton wool directly on the wound)
2. **Immobilize:** near joints = splint (magazine, template), otherwise **elevate** for 24–48 hours (less swelling = better healing)
3. **Check tetanus!** Last vaccination > 5 years (dirty wound) or > 10 years (clean wound) ago → arrange a booster as soon as possible
4. **Wound diary:** date, location, cause, number of stitches — basis for suture removal and follow-ups
5. First wound check after **24–48 hours:** change dressing, inspect edges, look for infection signs

7. Observing wound healing



Sutured wound on a hand — check daily from day 2 onward — Image: Sciencia58, Wikimedia Commons, CC0

7.1 Healing phases

Phase	Period	What happens	Normal signs
Inflammatory phase	Day 1–4	Hemostasis, germ defense, wound cleansing	Mild redness, warmth, pulsing, clear serous fluid
Proliferative phase	Day 3–10	New tissue, vessels grow, wound contracts	Redness fading, edges adhere, possibly itching
Remodeling phase	from day 8	Collagen hardens, scar stabilizes	Scar reddish → paler, feels tight

7.2 Daily check: normal or infection?

Sign	Normal ✓	Infection ⚠
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Pain	Clearly better by day 2-3	Increasing, pulsating, worsening after day 3
Redness	Thin, pale rim, receding	Spreading (>1 cm), hard, hot
Discharge	Clear, yellowish-transparent, little	Cloudy-purulent, foul-smelling, increasing
Swelling	Strongest on days 1-2, then receding	Growing, tense, sutures dig in
Temperature	Normal	Fever > 38 °C, chills
Surroundings	Skin normal	Red streaks toward the heart (lymph vessels!), swollen lymph nodes

 **Seek medical help as soon as reachable:** fever > 38.5 °C, red streaks, strongly swelling wound, pus or foul smell, sutures loosening while swelling grows. Until then: remove/loosen sutures in the affected area, keep the wound open (drain), antiseptic gauze, immobilize, drink plenty.

7.3 Removing sutures — when?

Body region	Suture removal
Face	Day 5-7
Scalp/torso	Day 7-10

Arms/hands	Day 10–14
Legs	Day 10–14
Joints/sole/high-stress areas	Day 14–21

The longer the sutures stay, the safer the wound — but the stronger the **suture marks** (thread holes). Face as early as possible, high-stress areas as late as possible.

7.4 Removing sutures — how it's done

1. Clean the dressing area and suture zone with disinfectant, put on gloves
2. Lift the knot with sterile forceps and expose the thread segment crossing the wound edge
3. Insert the scissors **close to the skin** under the knot and cut the thread — so no contaminated thread side remains under the skin
4. Pull the thread by the knot **parallel to the skin** toward the wound edge (never straight up — tears the wound open!)
5. Disinfect again, apply Steri-Strips across if needed, keep dry for 24 hours

8. Supporting wound healing

Nutrition & lifestyle

- **Protein** (meat, eggs, legumes, dairy): building material for new tissue — especially important in crisis times
- **Vitamin C** (citrus fruits, sauerkraut, peppers, wild plants): collagen build-up
- **Zinc** (meat, cheese, whole grains, pumpkin seeds): cell renewal & immune defense
- **Drink plenty** (2–3 liters), **don't smoke** (nicotine cuts tissue oxygen and delays healing by days to weeks)

- **Blood sugar:** diabetics face many times the healing problems — check the wound daily

Wound care

- **Rest:** elevate and spare limbs 24–72 h, splint near joints
- **Dressing changes** daily or when soaked, always with clean/sterile materials and hand hygiene
- **Keep moist, don't let dry out:** wound edges under the suture should not crust over; a thin layer of antiseptic ointment on the surroundings (not into the wound) prevents thread cutting in
- **No ointments on freshly sutured, closed wounds** unless needed — the suture already closes it
- **Scar care after healing:** gentle massage for 8–12 weeks + **sun protection** (at least 12 months — otherwise the scar stays darker)

9. Complications & what to do

Complication	Recognize	Act
Wound infection	Spreading redness, pus, pain, fever	Remove sutures in the affected area, treat open with antiseptics, antibiotic if available, seek a doctor
Dehiscence (wound gapes again)	Torn threads, open gap	Fresh/clean: Steri-Strips; inflamed: never re-suture, treat open

Suture strangulation	White pressure marks, threads cutting in	Early suture removal if possible, otherwise loosen individual stitches early, secure with Steri-Strips
Hypertrophic scar/keloid	Bulging, growing scar after healing	Silicone plasters/gel, sun protection, pressure massage — usually recedes over months
Scar contracture	Tension/movement restriction over joints	Scar massage + stretching exercises after healing, physiotherapy if available

10. Did you know?

- Suturing is millennia old: **ancient Egyptian** sources (c. 1550 BC, Ebers Papyrus) describe wound sutures, and in India wounds were stitched as early as the 6th century BC with fine needles and threads.
- The classic surgical thread made of **catgut** (intestine strands) was only replaced by synthetic threads in the 20th century.
- Ambroise Paré (16th century) made ligature (tying off blood vessels) instead of cauterizing with boiling oil the standard — a milestone in wound surgery.
- The **simple interrupted suture** used today is the oldest and most frequently used suturing technique worldwide — robust enough for every layperson's crisis case.

 More info: [First Aid: The Basics](#) | [Stock First Aid Kit Optimally](#) | [Healing with Plants](#)

 Sources: [Wikipedia: Surgical suture](#) | [Wikipedia \(DE\): Wundnaht](#) | [Offline archive: First aid](#)

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