

Cardiac Arrest Rhythms

When the heart stops, it shows up in one of four rhythms on the monitor—two you can shock, two you cannot.

THE STORY IN ONE SENTENCE

When the heart stops, it shows up in one of four rhythms on the monitor—two you can shock, two you cannot.

“Cardiac arrest means no heartbeat and no blood flow. V-fib and V-tach are wild, chaotic rhythms you shock to reset the heart. PEA and asystole mean the heart is too sick or empty to beat—so you do CPR and fix the cause (low fluid, no oxygen, clot in the lung, too much potassium, cold, poison, collapsed lung, fluid crushing the heart, or injury).”

Normal anatomy — the body's job

The heart is a four-chamber pump (two on top called atria, two on bottom called ventricles) that runs on electricity. A spark starts at the top in a tiny patch of cells called the SA node (the heart's natural pacemaker). The spark spreads across both atria so they squeeze and fill the ventricles. Then the spark travels down a wire (the AV node and His-Purkinje system) into the thick bottom chambers (ventricles), and they squeeze hard to shoot blood out—left ventricle to the body, right ventricle to the lungs. This cycle repeats sixty to one hundred times every minute, and each squeeze moves about two ounces of blood. For the pump to work, you need three things working together: an electrical spark in the right order, heart muscle strong enough to squeeze, and enough blood inside the heart to push out.

BODY'S JOB

The heart's only job is to keep blood moving in a loop. Blood picks up oxygen in the lungs, the left side of the heart pumps that oxygen-rich blood out to feed every organ (brain, kidneys, liver, muscles), then the blood returns low in oxygen and the right side of the heart pumps it back to the lungs to pick up more oxygen. Without that constant flow, the brain starves in four to six minutes and organs start to die.

1. A spark fires in the SA node (top right corner of the heart).
2. The spark spreads across both atria; they squeeze and push blood down through one-way valves into the ventricles.

3. The spark travels through the AV node (a gate between top and bottom chambers) and then shoots down special wires (bundle of His and Purkinje fibers) that wrap around the ventricles.
4. Both ventricles squeeze at the same time: the right ventricle pumps blood to the lungs to pick up oxygen; the left ventricle pumps oxygen-rich blood out the aorta to the whole body.
5. The heart muscle relaxes, the chambers fill again, and the cycle repeats—every second of your life.

What breaks

Cardiac arrest means the heart stops doing its job—no organized beat, no blood flow. The four rhythms show different ways the heart can stop. In V-fib and V-tach the electrical system goes haywire; the spark fires so fast and chaotic that the muscle just quivers or beats uselessly. In PEA and asystole the heart is too sick, too empty, too crushed, or too poisoned to beat even if some electrical spark is still there (PEA) or the spark has died completely (asystole).

CLINICAL TERM

Cardiac arrest rhythms

How the body compensates

There is no compensation in true cardiac arrest—the heart has stopped and the body cannot fix that on its own. The only reason a person might survive even a few minutes is if someone starts CPR (chest compressions) right away. Compressions squeeze the heart between the breastbone and spine, forcing a small amount of blood out to the brain and lungs with each push. That keeps a trickle of oxygen reaching the brain and buys time until the team can shock the heart (for V-fib or V-tach) or find and fix the cause (for PEA or asystole). Without CPR, the brain dies in four to six minutes and the heart will not restart.

1. Cardiac arrest means zero blood flow—the body has no way to compensate because the pump has stopped.
2. Immediate CPR (hard, fast chest compressions at least two inches deep, 100–120 pushes per minute) becomes the only pump. Each push moves about one-quarter to one-third the normal amount of blood—not much, but enough to keep the brain alive for a short time.
3. If the rhythm is V-fib or V-tach, a defibrillator shock stops all electrical activity for a split second, letting the heart's natural pacemaker restart an organized beat. CPR continues between shocks.

4. If the rhythm is PEA or asystole, there is no point in shocking. The team does CPR and runs through the H's and T's list: push IV fluid fast for low volume, open the airway and give oxygen for low oxygen (hypoxia), give sodium bicarbonate if the blood is too acidic, give calcium or insulin-and-sugar to fix potassium, warm the body if cold, stick a big needle into the chest if air is trapped and squashing the heart or lung, cut a small hole in the sac around the heart to drain crushing fluid, give clot-busting medicine for a lung clot, give antidote for poison (naloxone for opioids, calcium for calcium-channel blocker, lipid emulsion for certain drug overdoses).
5. The longer CPR goes on, the less likely the heart will restart with a rhythm strong enough to pump on its own. Brain damage becomes permanent after about ten minutes without any blood flow (longer if the person is very cold). Most guidelines say if you have done high-quality CPR for twenty to thirty minutes, tried every reversible cause, and the rhythm is still asystole or PEA with no pulse, it is usually time to stop.
6. The key is speed—every minute without CPR or defibrillation drops survival by 7–10%. That is why teaching the public hands-only CPR (just push hard and fast in the center of the chest) and putting AEDs (automated external defibrillators) in public places saves lives.

Domino effect

1. The heart stops beating (or beats uselessly), so blood stops flowing. — In V-fib the muscle just quivers; in V-tach it beats too fast to fill; in PEA the muscle cannot squeeze even though the spark is there; in asystole there is no spark at all. No matter the rhythm, the result is the same—zero blood pressure, zero pulse.
2. The brain runs out of oxygen within seconds and starts to die within four to six minutes. — The brain has no reserve; it depends on a constant flow of oxygen-rich blood every second. When blood stops, brain cells start dying. After ten minutes without any blood flow, most of the brain is permanently damaged.
3. The person collapses, is unresponsive, and stops breathing (or only gasps). — The brain controls consciousness and breathing. When it loses oxygen, the person blacks out instantly and the breathing center in the brainstem shuts down. You may see occasional gasps (called agonal breathing)—that is a reflex, not real breathing.
4. The skin turns pale or blue-gray (cyanosis), and the pupils get wide and do not react to light. — Without blood flow, oxygen leaves the blood in the skin and it looks dusky. The muscles that shrink the pupils need oxygen and stop working, so the pupils stay wide open.

5. The heart muscle itself runs out of oxygen and gets weaker, making it even harder to restart. — The heart feeds itself through small arteries (coronary arteries) that branch off the aorta. When the heart stops pumping, those arteries have no pressure and the heart muscle starves. The longer the arrest, the more damage to the heart—even if you get it started again, it may be too weak to pump well (this is why many people who survive cardiac arrest end up in the ICU on medicines or a pump to help the heart).
6. Other organs—kidneys, liver, intestines—start to fail because they are not getting blood either. — Every organ needs oxygen. The kidneys stop making urine, waste builds up in the blood, the intestines' lining starts to break down and leak bacteria into the bloodstream, and the liver cannot clean toxins. If the arrest lasts long or CPR quality is poor, multi-organ failure follows even if the heart restarts.
7. If CPR or defibrillation does not happen fast, the person will die—or survive with severe, permanent brain damage. — The brain is the most fragile organ. Even if you restart the heart after ten or fifteen minutes, the brain may be too damaged to wake up or function. That is why bystander CPR and early defibrillation (within the first few minutes) are the only things proven to save lives and brains in cardiac arrest.
8. Even after the heart restarts (called return of spontaneous circulation, or ROSC), the person often stays unconscious and needs ICU care—cooling the body, blood pressure support, breathing machine, and treatment for the cause—to protect the brain and keep the heart from stopping again. — Restarting the heart is only step one. The whole body has been through massive stress (ischemia-reperfusion injury—when blood flow suddenly comes back, it can create harmful chemicals and swelling). The team keeps the person cool (around 36°C) for 12–24 hours to slow brain swelling, watches for seizures, and fixes whatever caused the arrest (puts in a stent to open a blocked artery, drains fluid from around the heart, corrects electrolytes). Many people who get ROSC still die in the ICU or wake up with brain damage because the arrest lasted too long or CPR quality was not good enough.

Symptoms · what the patient feels, and why

- No pulse felt anywhere on the body: The heart has stopped pumping blood forward in a way that creates pressure in the arteries, so there is no wave of blood to feel under your fingers.
- No breathing or only gasping breaths (agonal breathing): The brain is not getting oxygen, so the breathing center shuts down or sends out uncoordinated signals that cause short, ineffective gasps.
- Unresponsive to any stimulus: Without blood flow, the brain loses oxygen within seconds and cannot process signals or send responses, so the person cannot wake up, talk, or move on purpose.

- Sudden collapse without warning: The heart's electrical system suddenly fails or becomes chaotic, stopping effective pumping instantly, and the person drops because the brain loses power immediately.
- Skin turns blue or gray (cyanosis), especially lips and fingertips: Blood is not carrying fresh oxygen to the body, so hemoglobin (the red protein in blood that carries oxygen) turns dark, making the skin look blue or gray through the surface.
- Pupils become wide and do not shrink when light is shined into the eyes: The brain stem, which controls pupil size, stops working without oxygen, so the pupils stay dilated (wide open) and do not react to light.
- No normal heart sounds heard with a stethoscope, or very weak disorganized sounds: The heart muscle is either completely still, quivering uselessly, or beating too fast and weak to create the strong, organized thump of a normal heartbeat.
- Monitor shows ventricular fibrillation (VF): a wild, irregular, squiggly line with no clear beats: The lower chambers of the heart are quivering in a fast, chaotic way instead of squeezing together, so the electrical signal on the monitor looks like a shaky scribble rather than organized peaks.
- Monitor shows ventricular a fast heart rate (tachycardia) (VT) without a pulse: very fast, wide, regular peaks but no blood is moving: The lower heart chambers are beating extremely fast (usually over 100 beats per minute) from an abnormal electrical focus, but they are squeezing so fast and weakly that no blood actually gets pushed out into the arteries.
- Monitor shows a flat line (asystole) or very slow, dying beats (PEA: electrical activity without a pulse): In asystole, the heart's electrical system has completely stopped firing. In PEA (pulseless electrical activity), the monitor shows some electrical signal, but the heart muscle is too damaged, empty, or blocked to squeeze and pump blood forward.

Focused exam

- No pulse felt at the carotid (neck) or femoral (groin) artery for 10 seconds: Cardiac arrest means the heart has stopped pumping blood. If you cannot feel a pulse in a big artery near the heart, blood is not moving through the body. The brain will die in 4–6 minutes without blood flow, so this finding means you must start CPR immediately.
- Monitor shows ventricular fibrillation (VF) — wild, chaotic squiggles with no clear pattern: VF means the heart muscle is twitching randomly like a bag of worms instead of squeezing in one smooth motion. No blood pumps out. This is a shockable rhythm: the defibrillator can reset the electrical chaos back to an organized beat so the heart can pump again.

- Monitor shows pulseless ventricular a fast heart rate (tachycardia) (VT) — fast, wide, regular waves but no pulse: The heart is beating very fast (usually over 150 times per minute) but the squeeze is so weak or uncoordinated that no blood actually gets pushed out. This is also shockable: a defibrillator shock can reset the rhythm to a slower, stronger beat.
- Monitor shows pulseless electrical activity (PEA) — organized rhythm on screen but no pulse: The heart's electrical signal looks normal or slow, but the muscle is not strong enough to pump blood. This is not shockable. You must find and fix the upstream problem (the Hs and Ts — like low blood volume, blood clot in the lung, or fluid squeezing the heart) or the heart will not restart.
- Monitor shows asystole — a flat line with no electrical activity: The heart has completely stopped sending electrical signals. This is not shockable. CPR and epinephrine can buy time, but you must find the reversible cause (Hs and Ts) or the heart will not restart. Asystole after prolonged arrest often means the brain and heart are too damaged to recover.
- Skin is pale, gray, or blue (cyanotic): When the heart stops, blood stops moving. Pale or gray skin means blood has drained from the skin. Blue lips, fingertips, or face mean the blood still in those areas has run out of oxygen. Both tell you the body is starving for oxygen right now.
- No breathing, or only occasional gasps (agonal breathing): Cardiac arrest shuts off blood flow to the brainstem, which controls breathing. The person may gasp a few times — these gasps are reflexes, not real breaths, and they do not move oxygen into the lungs. You must give rescue breaths or use a ventilator during CPR to push oxygen in.

Diagnostics · every test answers a question

- Arterial blood gas (ABG) during CPR → Is the blood too acidic ($\text{pH} < 7.20$), and is carbon dioxide building up or oxygen dropping?
- Potassium (K^+) level → Is potassium dangerously high or low?
- Glucose (blood sugar) → Is blood sugar dangerously low (hypoglycemia)?
- Lactate level → How long has the body been starving for oxygen?
- Troponin I or T → Did a heart attack (myocardial tissue death from blocked blood flow (infarction)) cause the arrest?
- Point-of-care ultrasound (POCUS) during CPR → Is there fluid around the heart (tamponade), a collapsed lung (pneumothorax), or a huge blood clot (pulmonary a traveling clot lodging in a vessel (embolism))?
- Core body temperature (rectal or esophageal probe) → Is the person too cold (hypothermia) or overheated (hyperthermia)?

- Toxicology screen or drug history → Did the person overdose on a drug or poison that stops the heart?

Treatment logic

- Start high-quality CPR immediately: push hard and fast on the center of the chest at 100–120 compressions per minute, let the chest come all the way back up after each push, and minimize pauses → Chest compressions squeeze the heart between the breastbone and the spine, forcing blood out to the brain and lungs. This keeps the brain alive while you work to restart the heart. High-quality CPR doubles or triples the chance of survival.
- Defibrillate (shock) immediately if the monitor shows VF or pulseless VT — use 120–200 joules biphasic or 360 joules monophasic, then resume CPR for 2 minutes before checking rhythm again → The electrical shock stops all the chaotic signals in the heart muscle at once (depolarizes every cell). When the cells reset, the heart's natural pacemaker (the SA node) can take over and start an organized rhythm that pumps blood again.
- Give epinephrine 1 mg IV or intraosseous (IO) every 3–5 minutes during the code → Epinephrine tightens blood vessels all over the body (alpha agonist), which raises blood pressure and pushes more blood to the heart and brain during CPR. It also makes the heart muscle more sensitive to shocks and more likely to restart.
- Give amiodarone 300 mg IV or IO (first dose), then 150 mg IV if VF or pulseless VT continues after 2–3 shocks → Amiodarone slows down and stabilizes the chaotic electrical signals in the heart muscle (blocks sodium, potassium, and calcium channels). This makes it easier for the defibrillator shock to reset the rhythm and keeps the heart from going back into VF or VT right away.
- Secure the airway with an endotracheal tube (ETT) or supraglottic airway (like an i-gel or King LT), then give breaths at 10 per minute with 100% oxygen while continuing compressions without pausing → A tube in the windpipe keeps the airway open and delivers pure oxygen directly into the lungs. This raises the oxygen level in the blood so CPR can carry oxygen to the brain and heart. It also prevents vomit from going into the lungs (aspiration).
- Find and fix the Hs: Hypovolemia (low blood volume — give IV fluids or blood), Low oxygen (Hypoxia) (low oxygen — intubate and give 100% O₂), Hydrogen ion (acidosis — give sodium bicarbonate if pH < 7.1), Hypo/High potassium (Hyperkalemia) (give calcium, insulin + glucose, or potassium), Hypothermia (warm the person to at least 32°C), Low blood sugar (Hypoglycemia) (give D50 IV) → Each H is a reversible cause of cardiac arrest. Fixing the upstream problem stops the arrest from continuing or coming back after the heart restarts. For example, giving fluids for low blood volume refills the heart so it has something to pump; warming a cold person lets the heart respond to shocks and drugs again.

- Find and fix the Ts: Tension pneumothorax (collapsed lung — needle decompression or chest tube), Tamponade (fluid around heart — pericardiocentesis), Toxins (drugs or poisons — give antidotes like naloxone, calcium, sodium bicarbonate, or lipid emulsion), Clot formation (Thrombosis) coronary (heart attack — emergency cardiac cath and stent), Clot formation pulmonary (blood clot in lungs — give tPA 50 mg IV during CPR if confirmed) → Each T is a mechanical or chemical block that stops the heart from pumping even if the electrical rhythm looks okay. For example, draining fluid from around the heart (tamponade) lets the heart fill and squeeze again; opening a blocked coronary artery (thrombosis) restores blood flow to dying heart muscle so it can pump.
- After the heart restarts (return of spontaneous circulation, ROSC), cool the body to 32–36°C for 24 hours (targeted temperature management, also called therapeutic hypothermia) → Cooling slows down the brain's metabolism so brain cells need less oxygen and are less likely to die from the injury caused by the arrest. It also reduces inflammation and swelling in the brain after blood flow restarts. Cooling improves the chance the person will wake up and think normally.

Medications

Epinephrine (adrenaline) · Vasopressor (blood-vessel squeezer) and cardiac stimulant

Epinephrine is a hormone that squeezes blood vessels tight all over the body, pushing blood toward the heart and brain during cardiac arrest. It also makes the heart muscle more receptive to the next shock and helps restart a weak heartbeat.

1. During cardiac arrest, the heart has stopped pumping effectively, so blood pressure drops to nearly zero and vital organs (brain, heart, kidneys) get no oxygen.
2. You give 1 mg of epinephrine into a vein (or into the bone marrow if no vein is available) every 3 to 5 minutes while doing CPR.
3. Epinephrine locks onto alpha receptors on blood vessel walls and tells them to squeeze tight (vasoconstriction), like tightening a garden hose.
4. This squeezing raises the pressure inside the arteries, which forces blood forward through the coronary arteries (the vessels that feed the heart muscle itself) and through the brain.
5. More blood reaching the heart muscle gives it oxygen and energy, making it more likely to respond to the next defibrillator shock.
6. Epinephrine also binds to beta-1 receptors on heart cells, which increases the strength and speed of any heartbeats that do occur and makes the fibrillating heart more likely to convert to a shockable rhythm.
7. The drug does NOT restart the heart on its own—it buys time and improves conditions so that CPR and defibrillation can work.

SAFETY WATCH

After the heart restarts, epinephrine can cause very high blood pressure, fast heart rate, and irregular beats—monitor closely and be ready to give medications to control heart rate or blood pressure. · Too much epinephrine or doses that are too close together can make the heart irritable and trigger dangerous rhythms after return of spontaneous circulation. · In a patient who is NOT in cardiac arrest, epinephrine can cause stroke, heart attack, or severe high blood pressure—only use it during true pulseless arrest. · If given through a peripheral IV that has leaked into the tissue (infiltration), epinephrine can kill the surrounding skin and muscle; check the IV site carefully.

Amiodarone · Antiarrhythmic (rhythm-stabilizing drug, class III)

Amiodarone calms down the electrical chaos in the heart muscle during ventricular fibrillation or pulseless ventricular a fast heart rate (tachycardia) by blocking multiple ion channels (tiny gates that control electrical signals). This makes it harder for the heart to fire off wild, disorganized beats and easier for a normal rhythm to take over after a shock.

1. When the heart is in ventricular fibrillation, hundreds of tiny areas are firing electricity at random, like a room full of people all shouting at once—no organized squeeze happens.
2. After the first shock fails to restore a rhythm, you give 300 mg of amiodarone through an IV or into the bone marrow.
3. Amiodarone blocks potassium channels (the gates that let potassium leave heart cells after each beat), which makes each cell's refractory period longer—the cell stays 'tired' and cannot fire again right away.
4. It also blocks some sodium and calcium channels and interferes with adrenaline receptors, which together slow down the chaotic electrical waves racing through the muscle.
5. This gives the defibrillator shock a better chance of 'resetting' all the cells at once, so they can start beating together in an organized way.
6. If VF or pulseless VT continues or comes back, you can give a second dose of 150 mg.
7. Amiodarone does NOT restart the heart by itself—it makes the heart more stable so the shock and CPR can succeed.

SAFETY WATCH

Amiodarone can drop blood pressure suddenly, especially if given too fast—infuse over several minutes and watch for pressure to fall. · It can slow the heart rate too much after the patient's pulse returns; monitor the rhythm closely. · Long-term use (not during arrest, but afterward in the ICU) can damage the lungs, liver, thyroid gland, eyes, and skin—those risks do not matter during the few minutes of resuscitation, but be aware if the patient will stay on it. · Amiodarone can interact with many other drugs (such as warfarin, digoxin, and statins), but during a cardiac arrest you do not hold back—the immediate life-threat outweighs drug interactions. · If no IV or bone access is available, you cannot give amiodarone (it does not work through a breathing tube into the lungs).

Lidocaine · Antiarrhythmic (rhythm-stabilizing drug, class Ib) and local anesthetic

Lidocaine blocks sodium channels in heart muscle cells, which slows down the wild electrical firing that happens during ventricular fibrillation or ventricular a fast heart rate (tachycardia). It is a second-choice drug if amiodarone is not available.

1. During VF or pulseless VT, heart cells are firing electricity uncontrollably.
2. If you do not have amiodarone, you give lidocaine 1 to 1.5 mg per kilogram of body weight (roughly 75 to 100 mg for an average adult) into a vein or bone.
3. Lidocaine enters heart cells and blocks sodium channels—the gates that let sodium rush in to start each heartbeat.
4. Blocking these gates makes it harder for damaged or oxygen-starved cells to fire off extra beats, which quiets the chaos.
5. This stabilizes the rhythm enough that a defibrillator shock has a better chance of resetting all the cells at once.
6. Lidocaine works faster than amiodarone (within 1 to 2 minutes) but is slightly less effective overall, which is why it is the backup choice.

SAFETY WATCH

Too much lidocaine or repeat doses can cause confusion, seizures, or even coma—use the correct weight-based dose and do not give it over and over. · Lidocaine can slow the heart or lower blood pressure after the pulse returns. · In patients with severe liver disease, lidocaine builds up because the liver cannot break it down—use a lower dose if you know the liver is failing, but during an arrest you often do not have time to check. · Do NOT give lidocaine into the breathing tube (endotracheal route); it does not absorb well and wastes time—use IV or bone access only.

Red flags

- No pulse and no breathing—start CPR immediately and call for help; every second without blood flow kills brain cells
- Rhythm on monitor is ventricular fibrillation (VF) or pulseless ventricular a fast heart rate (tachycardia) (VT)—shock with a defibrillator as soon as possible to try to reset the heart
- Flat line (asystole) or PEA rhythm—look for and fix reversible causes fast (low oxygen, low blood volume, heart squeeze from fluid around it, blood clot in lung, heart attack, low potassium or high potassium, overdose, low body temperature, tension in chest from collapsed lung)
- Person collapsed suddenly in front of you—survival depends on immediate high-quality chest compressions and early defibrillation; do not wait for advanced help to start CPR

Nursing priorities

1. Start chest compressions immediately within 10 seconds of finding no pulse, pushing at least 2 inches deep on the center of the chest at a rate of 100 to 120 compressions per minute — Brain cells die after 4 to 6 minutes without oxygen; chest compressions squeeze the heart to push blood to the brain and keep cells alive until the heart can be restarted
2. Apply defibrillator pads and check the rhythm within the first minute; if VF or pulseless VT is seen, deliver one shock immediately then resume compressions for 2 full minutes before checking rhythm again — VF and pulseless VT are disorganized electrical storms in the heart muscle; early defibrillation stops the storm and gives the heart a chance to restart in a normal rhythm before the muscle runs out of energy
3. Place an advanced airway (endotracheal tube or supraglottic airway) and give 1 breath every 6 seconds with 100 percent oxygen once compressions are ongoing; do not stop compressions to give breaths — The blood being pumped by compressions must carry oxygen to stay useful; however pausing compressions to breathe drops blood pressure to zero and wastes critical blood flow (perfusion) time
4. Establish IV or intraosseous (IO) access in a large vein and give 1 mg of epinephrine (adrenaline) every 3 to 5 minutes throughout the arrest — Epinephrine squeezes blood vessels tight (vasoconstriction), which raises blood pressure during compressions and pushes more blood into the coronary arteries feeding the heart muscle itself
5. For shockable rhythms, give 300 mg amiodarone IV push after the second shock if VF or pulseless VT continues; for non-shockable rhythms, search for and treat reversible causes using the Hs and Ts list — Amiodarone stabilizes heart cell membranes and makes it harder for VF to restart after a shock; reversible causes like low oxygen, tension pneumothorax (collapsed lung), or high potassium can be fixed and allow the heart to restart

6. Rotate the person doing compressions every 2 minutes without pausing compressions for more than 10 seconds during the switch — High-quality compressions require significant physical effort; compressor fatigue sets in after 2 minutes and depth decreases, which reduces blood flow to the brain and heart
7. Monitor end-tidal CO₂ (the amount of carbon dioxide in exhaled air) continuously with a number goal above 10 mmHg; if it suddenly jumps above 40 mmHg, check for return of spontaneous circulation immediately — End-tidal CO₂ measures how much blood flow the compressions are generating; low numbers mean compressions are not effective; a sudden rise means the heart has restarted and is now pumping blood to the lungs on its own
8. After return of spontaneous circulation, start targeted temperature management by cooling the patient to 32 to 36 degrees Celsius for 24 hours and avoid fever for at least 72 hours — Cooling the brain slows down metabolism and reduces the inflammatory cascade (swelling and chemical damage) that continues to kill brain cells for hours after circulation is restored; this improves neurologic outcomes and survival

Sources

- AHA Advanced Cardiovascular Life Support (ACLS) 2020 Guidelines
- AHA Basic Life Support (BLS) 2020 Guidelines
- Circulation (AHA journal) 2020 update on CPR and emergency cardiovascular care

Last reviewed: 2026-07-07