

Drowning

Drowning means the body cannot get oxygen because water gets in the way — either blocking the throat or filling the lungs — and without oxygen, vital organs start to fail fast.

THE ONE-LINE TRUTH

Drowning causes the body to run out of oxygen because water blocks the airways or floods the lungs, and that oxygen loss can damage the brain, heart, and lungs within minutes.

The chain — how it unfolds

1. The person submerges and the throat snaps shut (laryngospasm). — why: Water touches the back of the throat, and a reflex closes the airway tight to protect the lungs — a survival instinct that works for a few seconds.
2. They hold their breath and fight the urge to breathe. — why: The brain senses rising carbon dioxide and screams to breathe, but the person resists to avoid inhaling water — this fight can only last 30–90 seconds in most people.
3. The laryngospasm breaks, or the person gasps, and water floods into the lungs. — why: Eventually the drive to breathe overpowers the reflex, or the throat muscles fatigue and relax, and water pours into the airway and lungs instead of air.
4. Water washes away surfactant and damages the air sac walls. — why: Surfactant (the slippery coating that keeps air sacs open) is stripped off by the water, and the thin walls of the air sacs are injured, so oxygen can't cross into the blood anymore — both fresh water and salt water cause this damage.
5. The blood oxygen level drops (hypoxia). — why: With damaged lungs that can't pull oxygen in, the oxygen level in the blood falls fast, and every organ starts to starve — the brain and heart are the most sensitive and fail first.
6. The heart becomes irritable and can stop (cardiac arrest). — why: Without oxygen, the heart muscle can't beat properly; it may develop dangerous rhythms (ventricular fibrillation) or just stop completely (asystole), cutting off all blood flow to the brain.
7. The brain shuts down and begins to die. — why: Brain cells die within 4–6 minutes without oxygen; the longer the person is underwater and the longer until resuscitation starts, the worse the brain injury — this is why time is everything in drowning.

8. If rescued and revived, the person may develop acute respiratory distress syndrome (ARDS) within hours. — why: The immune system responds to the lung injury by flooding the air sacs with inflammation and fluid, which blocks oxygen all over again — this secondary injury can be just as dangerous as the initial drowning and requires intensive care with oxygen or a ventilator.

Spot it — what you see, and why

- The person was underwater or their face was in the water: When someone's mouth and nose go under the surface, water can get into the airway and lungs instead of air. This stops oxygen from reaching the blood and floods the tiny air sacs (alveoli) where breathing happens.
- They cough hard and sound wet: The lungs are trying to push out the water that got inside. Coughing is the body's reflex to clear the airways so air can move again.
- They breathe fast and work hard to breathe: The flooded air sacs cannot grab oxygen from the air anymore, so the brain tells the body to breathe faster and harder to try to get enough oxygen. The chest muscles have to work extra to push and pull air past the fluid.
- Crackling or bubbling sounds in the lungs when you listen with a stethoscope: Air is trying to move through fluid and damaged air sacs. This makes tiny popping and bubbling noises, like blowing through a straw into a glass of water.
- Low oxygen level on the pulse oximeter (the finger clip): Water in the lungs blocks oxygen from crossing into the blood. The device measures how much oxygen is attached to red blood cells, and it drops because those cells are not getting refilled.
- Confusion or acting strange: The brain needs a steady supply of oxygen to work right. When oxygen drops, brain cells cannot fire normally, so thinking gets fuzzy and the person may be disoriented or slow to respond.

Red flags — act now

- Any trouble breathing or fast breathing that does not get better quickly
- Confusion, extreme sleepiness, or not responding normally
- Blue or gray color to the lips or face
- Coughing up pink or frothy spit (a sign of fluid building up in the lungs)
- Chest pain or very low oxygen level on the monitor

Treat it — in this order

1. Five rescue breaths (mouth-to-mouth or bag-mask) before starting chest compressions if the person has no pulse → Pushes oxygen into the lungs immediately, fighting the severe lack of oxygen that started the moment water blocked the airway. In drowning, oxygen loss is the main problem, so breaths come before pumping the chest (which is the opposite order from most cardiac arrests).
2. High-flow oxygen by mask or nasal cannula, or positive-pressure ventilation (bag-mask, CPAP, BiPAP) if breathing is very weak → Delivers more oxygen into the bloodstream by pushing it across the damaged lung lining under pressure. Positive pressure also helps collapsed air sacs pop open so oxygen can cross into the blood.
3. Intubation (breathing tube) and mechanical ventilator with lung-protective settings (tidal volume 6 mL/kg ideal body weight, plateau pressure $\leq$ 30 cm H₂O, PEEP 5–15 cm H₂O) for severe cases → Takes over breathing completely and delivers oxygen straight to the deepest air sacs while keeping pressure gentle so the injured lungs do not tear or swell more (which would worsen acute respiratory distress syndrome, or ARDS).
4. Cervical spine (neck) immobilization with a collar or backboard if the person dove, jumped, or fell into the water → Prevents a second injury—spinal cord damage from moving a broken neck bone—while the body is already fragile from lack of oxygen. Diving and falls can break neck bones.
5. Rewarming (remove wet clothes, cover with blankets, give warm IV fluids, or use a warming blanket) if body temperature is below 95°F (35°C) → Brings body temperature back to normal so the heart can beat properly and cells can use the oxygen being delivered. Cold slows the heart and makes the oxygen problem worse.

Your top priorities at the bedside

1. Check airway, breathing, and pulse immediately; start five rescue breaths before chest compressions if the person has no pulse. — why: Drowning causes death by lack of oxygen, not heart problems, so getting oxygen into the lungs first is more important than chest compressions alone; rescue breaths can restart breathing before the heart stops completely.
2. Apply a pulse oximeter and give high-flow oxygen by non-rebreather mask to keep oxygen saturation above 94 percent. — why: Drowning floods the alveoli (tiny air sacs in the lungs) with water, blocking oxygen from getting into the blood; high oxygen concentrations help push oxygen across the damaged lung tissue into the bloodstream.

3. Prepare for intubation (inserting a breathing tube) and mechanical ventilation if the patient has severe respiratory distress, low oxygen despite high-flow oxygen, or decreased level of consciousness. — why: Damaged lungs cannot expand well and the work of breathing exhausts the patient; a ventilator takes over the work and delivers precise oxygen and pressure to keep the lungs open and prevent further collapse.