

Gastroenteritis and Dehydration

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THE STORY IN ONE SENTENCE

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“Most gut bugs are viruses that clear on their own. The job is to replace lost water and salt before dehydration crashes the heart and kidneys.”

Normal anatomy — the body's job

The small and large intestines absorb water, salt, and nutrients from food while their lining (the mucosa) makes a protective mucus layer and pumps out immune cells to trap and kill any germs that sneak in with food or water.

BODY'S JOB

The gut lining is a one-cell-thick barrier covered in tiny finger-like bumps called villi that soak up water, sodium, potassium, and nutrients into the bloodstream. Goblet cells in the lining make slippery mucus that coats the inside and traps germs. Immune cells in the gut wall (including lymphocytes and macrophages) patrol constantly, recognize invaders, and release signals (cytokines) to kill them. Smooth muscle in the intestine wall squeezes in waves (peristalsis) to push food along at a controlled pace, giving time for absorption. Normally, the gut takes in about 9 liters of fluid a day (from food, drink, and digestive juices) and reabsorbs almost all of it, leaving only a small, formed stool.

1. Food and drink enter the stomach, where acid kills many germs.
2. The small intestine (duodenum, jejunum, ileum) absorbs most water, salt, and nutrients through the villi into tiny blood vessels.
3. The large intestine (colon) absorbs leftover water and forms solid stool, while goblet cells make protective mucus.
4. Immune cells in the gut wall constantly scan for and attack any bacteria, viruses, or parasites that break through the mucus.

5. The gut's squeezing waves (Peristalsis) moves contents smoothly, balancing absorption time with forward motion.
6. Healthy stool is soft and formed because the gut has reabsorbed the right amount of water.

What breaks

A virus, bacterium, or parasite invades the gut lining, triggering inflammation that damages the cells that absorb water and salt—so fluid pours into the intestines instead of being absorbed, and the inflamed gut squeezes hard to push the invader out, causing vomiting and watery diarrhea.

CLINICAL TERM

Infectious gastroenteritis with secondary dehydration due to enteric pathogen invasion, mucosal inflammation, and disrupted electrolyte and fluid homeostasis.

How the body compensates

The body tries to protect the brain and heart by speeding up the heart, tightening blood vessels to redirect blood from the skin and gut to vital organs, slowing urine to save water, and triggering thirst—so vital signs can look okay for a while even as dehydration worsens, until the system is overwhelmed and crashes into shock.

1. {'what': 'A fast heart rate (Tachycardia) (fast heart rate)', 'why': 'Baroreceptors in the carotid artery and aorta sense falling blood volume and signal the brainstem (medulla), which activates the sympathetic nervous system. This releases norepinephrine, making the heart beat faster to pump the remaining blood harder and try to maintain blood pressure and organ blood flow (perfusion).'} }
2. {'what': 'Peripheral vasoconstriction (cold, pale hands and feet)', 'why': 'Sympathetic nerves tighten (constrict) blood vessels in the skin, muscles, and gut to shunt blood away from these areas and preserve flow to the brain, heart, and kidneys. This is why the child's hands, feet, and nose feel cold and look pale or mottled—blood is being pulled inward.'} }
3. {'what': 'Decreased urine output (oliguria)', 'why': 'Low blood flow to the kidneys triggers the juxtaglomerular cells to release renin, starting the renin-angiotensin-aldosterone system (RAAS). Aldosterone tells the kidney tubules to reabsorb sodium and water. The posterior pituitary releases ADH (antidiuretic hormone), which makes the collecting ducts grab back even more water. Together these slow or stop urine production to keep water in the blood. Dark, concentrated urine or no urine is a red flag.'} }

4. {'what': 'Increased thirst and dry mucous membranes', 'why': 'Osmoreceptors in the hypothalamus detect rising blood sodium concentration (because water is lost faster than salt) and trigger thirst. Saliva production also drops because of low blood volume and sympathetic activation, so the mouth and lips become dry, the tongue looks parched, and in infants the soft spot on the head (anterior fontanelle) sinks.'}
5. {'what': 'Capillary refill time prolongs (slow color return after pressing the skin)', 'why': 'With less blood volume and vasoconstriction, it takes longer for blood to refill the tiny vessels in the skin after you press and release. Normal is under 2 seconds; 3 seconds or more signals significant dehydration.'}
6. {'what': 'Compensated shock can mask severity', 'why': 'Because the heart is beating faster and vessels are squeezed tight, blood pressure may stay normal or near-normal even when 10–15% of body water is lost (moderate dehydration). This is the dangerous middle—the child looks stable but is one step from collapse. When compensation finally fails (around 15–20% loss), blood pressure drops suddenly (decompensated shock), organs fail rapidly, and the window to reverse it narrows to minutes.'}
7. {'what': 'Too much acid in the blood (Acidosis) from poor blood flow (perfusion)', 'why': 'When blood flow drops, cells switch to anaerobic metabolism (making energy without oxygen), producing lactic acid. Bicarbonate is also lost in diarrhea. The blood becomes acidic (metabolic too much acid in the blood (acidosis)), which makes the brainstem increase breathing rate (tachypnea) to blow off CO₂ and try to balance the pH. Deep, fast breathing (Kussmaul respirations in severe cases) is a late, ominous sign.'}

Domino effect

1. A virus (like rotavirus or norovirus) or bacterium (like Salmonella or Campylobacter) enters the gut, usually from contaminated food, water, or hand-to-mouth contact. — The pathogen survives stomach acid, reaches the small or large intestine, and attaches to or invades the cells lining the gut wall (enterocytes), starting the infection.
2. The pathogen damages the gut lining and triggers inflammation. — Viruses kill enterocytes directly, flattening the villi and destroying the absorbing surface. Bacteria release toxins or invade the mucosa, and the immune system floods the area with cytokines (like IL-1, TNF- α , IL-8) and white blood cells, causing swelling, redness, and pain—this is inflammation. The damaged lining can no longer absorb water and salt properly.

3. Fluid and electrolytes pour into the intestine instead of being absorbed, and the gut squeezes hard to expel the invader. — Inflammation opens channels that let water, sodium, potassium, chloride, and bicarbonate flood from the blood into the gut lumen (secretory diarrhea). Toxins (like cholera or *E. coli* toxins) can force this secretion even without deep damage. Meanwhile, nerve signals and inflammatory mediators make the intestinal smooth muscle contract in strong, fast waves (hypermotility), pushing contents out rapidly as watery diarrhea. If the stomach is inflamed too (gastritis), it squeezes upward, causing vomiting.
4. Vomiting and diarrhea together pour water, sodium, potassium, and bicarbonate out of the body, faster than the child can drink to replace them. — Each loose stool can contain 10–20 mL/kg of fluid in a young child; frequent vomiting blocks oral intake. Within hours, total body water falls and blood volume (the amount of fluid in the blood vessels) drops—this is dehydration. Young children have less reserve and higher baseline fluid needs (per kilogram), so they dehydrate faster than adults.
5. The heart and blood vessels try to compensate by speeding up the pulse, tightening vessels, and slowing urine to keep blood flowing to the brain and heart. — Baroreceptors sense low blood volume and activate the sympathetic nervous system, releasing norepinephrine and epinephrine. The heart beats faster (tachycardia), blood vessels in the skin and gut constrict (cold, pale extremities), and the kidneys activate RAAS and ADH to hold onto sodium and water (dark, scanty urine). These tricks keep blood pressure up for a while—compensated shock—but they cannot fix ongoing losses.
6. Physical signs of dehydration appear: dry mouth and lips, sunken eyes, sunken soft spot (fontanelle) in infants, poor skin turgor (skin tents when pinched), reduced tears, and delayed capillary refill. — These are all visible clues that water has left the tissues and blood. The mucous membranes dry because saliva production drops. The eyes and fontanelle sink because the tissues behind them lose volume. Skin loses elasticity (turgor) because the interstitial (between-cell) fluid is depleted. Each finding is part of one story: falling total body water.
7. If dehydration worsens without treatment, compensation fails and the child tips into decompensated hypovolemic shock. — When 15–20% of body water is lost, the heart can no longer pump enough blood even at a fast rate. Blood pressure falls (hypotension), blood flow (perfusion) to the brain drops (causing confusion, lethargy, or unconsciousness), kidneys shut down (acute kidney injury, no urine output), and cells starve for oxygen, producing lactic acid (lactic too much acid in the blood (acidosis)). The child becomes pale, cold, unresponsive, and if not resuscitated immediately with IV fluids, progresses to multi-organ failure, cardiac arrest, and death.

8. In most viral and self-limited bacterial cases, the immune system clears the pathogen over 3–7 days, inflammation resolves, the gut lining heals, and normal absorption returns—if fluids have been replaced and the child has not crashed. — Antibodies, T cells, and gut-resident immune cells kill or neutralize the pathogen. Dead enterocytes are shed and replaced by stem cells in the crypts of the villi, regenerating the lining. Once inflammation settles, the villi regrow, absorptive function returns, and stool becomes formed again. This is why oral rehydration and time cure most gastroenteritis—the body does the work if you keep it alive with fluids.

Symptoms · what the patient feels, and why

- Watery diarrhea (loose, runny poop): The virus or germ irritates the lining of the intestines, making them leak water and salts instead of soaking them up, so the poop becomes thin and watery.
- Vomiting (throwing up): The infection triggers the brain's vomiting center and irritates the stomach lining, causing the body to push stomach contents back up and out.
- Belly cramps or pain: The intestines squeeze and twist harder than normal as they try to push out the infection, and the inflamed lining sends pain signals to the brain.
- Dry mouth and lips: When the body loses water through diarrhea and vomiting faster than it can replace it, saliva production drops and the mucous membranes (the wet tissue inside the mouth) dry out.
- Sunken eyes: Dehydration (not enough water in the body) shrinks the soft tissue around the eyes, making them look hollow or sunken into the face.
- Decreased urination (less pee or no wet diapers): The kidneys hold onto every drop of water they can when the body is dehydrated, so they make much less urine (pee) to protect what little water is left.
- Slow capillary refill (skin color takes longer than 2 seconds to come back after you press it): When the body is dehydrated, blood volume drops and the small blood vessels (capillaries) in the skin don't fill back up quickly after being squeezed, so the white spot from your finger press stays pale longer.
- Fever (body temperature above normal): The immune system releases chemicals called pyrogens (fever-makers) that reset the brain's thermostat higher to help fight the infection by making the body a less friendly place for germs.
- Blood or mucus in stool (slimy or bloody poop): Some bacteria (like *Shigella*, *Salmonella*, or *Campylobacter*) or parasites invade and damage the lining of the intestines, causing bleeding and mucus production as the tissue breaks down.

Focused exam

- Dry mouth and tongue: The child is losing water faster than they are taking it in through vomit and diarrhea. A wet, shiny mouth means the body still has enough water. A dry, sticky mouth means dehydration is already happening.
- Skin turgor — gently pinch the skin on the belly or arm and watch how fast it snaps back flat: Healthy skin has water inside the cells, so it bounces back instantly. If the pinched skin stays tented for more than 2 seconds, the body has lost so much water that the tissues are dried out. This is a clear sign of moderate to severe dehydration.
- Capillary refill — press the fingernail or toe until it turns white, then let go and count how many seconds until the pink color returns: Normally color returns in under 2 seconds because blood rushes back into the tiny vessels under the skin. If it takes longer than 2 seconds, dehydration has shrunk the blood volume so much that the heart cannot push blood out to the skin quickly. This is a red flag for shock.
- Urine output — ask when the child last peed and how much (check the diaper or toilet): The kidneys make less pee when the body is trying to hold on to every drop of water it has left. No pee in 6 hours or very little pee means severe dehydration. Dark, concentrated pee also points to low water in the body.
- Blood, mucus, or pus in the stool: Watery diarrhea alone usually means a virus. Blood or mucus means bacteria like Shigella, Campylobacter, or EHEC (a dangerous E. coli) have invaded the gut wall and caused inflammation. This changes whether the child needs antibiotics and close watching for kidney damage.
- Level of alertness and how the child acts — are they playing, fussy, or limp and sleepy?: A child who is alert and fussy is uncomfortable but the brain is still getting enough blood and oxygen. A child who is limp, sleepy, or hard to wake up means dehydration is so severe that blood pressure has dropped and the brain is not getting enough fuel. This is a medical emergency.

Diagnostics · every test answers a question

- Serum electrolytes (sodium, potassium, chloride, bicarbonate) → Has the child lost so much water and salt through vomit and diarrhea that the blood chemistry is out of balance?
- Blood urea nitrogen (BUN) and creatinine → Are the kidneys getting enough blood flow to filter waste, or has dehydration made them shut down?
- Stool culture and testing for Shiga toxin or EHEC → Is this caused by a dangerous bacteria that needs antibiotics or close watching, or just a virus that will go away on its own?
- Complete blood count (CBC) with peripheral smear if bloody diarrhea is present → Is the child developing HUS, where red blood cells are breaking apart and platelets are being used up?

- Urine specific gravity or urine osmolality → How hard are the kidneys working to hold on to water?
- Venous or capillary blood gas if the child looks very sick → Has dehydration caused the blood to become too acidic, and is the body compensating?

Treatment logic

- Oral rehydration solution (ORS) — a precise mix of salt, sugar, and water that matches what the gut absorbs best → Sugar in ORS pulls sodium and water into the blood through the intestine wall, even while diarrhea is happening. This refills the blood volume and prevents dehydration from becoming dangerous. ORS works for mild to moderate dehydration and is safer and cheaper than IV fluids.
- Intravenous fluids (normal saline or lactated Ringer solution) if the child cannot drink, is vomiting everything, or has severe dehydration with shock → Fluid goes straight into a vein, bypassing the sick gut entirely. This rapidly restores blood volume, raises blood pressure, and delivers oxygen to the brain, heart, and kidneys. IV fluids can save a life when the child is too dehydrated to absorb oral fluids.
- Ondansetron (Zofran) — a medicine that blocks the vomiting signal in the brainstem → Ondansetron stops the nausea center in the medulla (the lower part of the brainstem that controls vomiting) from firing. This lets the child keep down ORS and rehydrate by mouth instead of needing an IV. Studies show it cuts the need for IV fluids and hospital admission.
- Antibiotics (azithromycin for Shigella or Campylobacter, ceftriaxone for invasive Salmonella, metronidazole for C. difficile) — only when a dangerous bacteria is confirmed → Antibiotics kill the bacteria, stop toxin production, and reduce inflammation in the gut wall. This shortens the illness and prevents the infection from spreading into the blood in high-risk children (babies, immunocompromised patients). For Shigella, antibiotics also reduce spread to others.
- Zinc supplementation (10–20 mg daily for 10–14 days) in children under 5 in low-resource settings → Zinc helps the gut lining heal faster and shortens diarrhea by about one day. It also reduces the chance of another diarrhea episode in the next 2–3 months. WHO recommends this in areas where children often lack zinc in their diet.
- Probiotics (Lactobacillus GG or Saccharomyces boulardii) started early in the illness → Probiotics are helpful bacteria that compete with the bad germs in the gut and may help the gut lining recover faster. Some studies show they shorten diarrhea by about one day, especially in viral gastroenteritis.

- Frequent reassessment of hydration status — check mucous membranes, skin turgor, urine output, capillary refill, and mental status every 2–4 hours → Reassessment tells you if oral fluids are working or if the child is getting worse and needs IV fluids. It catches early signs of shock (fast heart rate, weak pulses, low blood pressure, confusion) before the child crashes.

Medications

Oral rehydration solution (ORS) · Electrolyte replacement solution

ORS is special salt water that fixes dehydration (when the body runs too low on water and minerals). It gives back the exact mix of sodium (salt), potassium (a mineral that keeps the heart steady), glucose (sugar), and chloride (another salt) that the intestine can grab quickly. The glucose in ORS helps the gut absorb sodium faster — they work like a team — so water follows them into the bloodstream instead of staying in the toilet bowl.

1. You drink the ORS, and it reaches the small intestine.
2. The glucose (sugar) in ORS binds to a special door (called SGLT1) on the gut wall.
3. When glucose goes through that door, it pulls sodium through with it — they travel together.
4. Water always follows sodium, so water rushes into the blood along with the sodium and glucose.
5. The potassium and chloride in ORS replace what was lost in diarrhea and vomit.
6. The blood volume climbs back up, the mouth gets wet again, the heart rate steadies, and the kidneys start making urine.

SAFETY WATCH

Do NOT use homemade salt water or sports drinks — the balance is wrong and can make things worse. · If the child cannot drink at all, keeps vomiting everything, or is too sleepy to swallow safely, ORS will not work — IV fluids (water through a vein) are needed instead. · Watch for signs ORS is working: wet mouth, tears when crying, urine every few hours. If these do NOT improve after a few hours, get medical help.

Intravenous (IV) fluids — normal saline or lactated Ringer's solution · Intravenous rehydration solution

IV fluids are salt water given directly into a vein when the gut cannot handle ORS (because of severe vomiting, extreme dehydration, or the child being too weak to drink). The fluid goes straight into the bloodstream and fills the tank back up fast. Normal saline is salt water that

matches blood salt levels. Lactated Ringer's also has potassium, calcium, and lactate (a chemical the liver turns into energy and uses to balance acid levels).

1. A nurse or doctor puts a tiny tube (IV catheter) into a vein, usually in the arm or hand.
2. Salt water flows through the tube and into the blood.
3. The blood volume rises quickly — within minutes to hours.
4. The heart does not have to race as hard because there is enough fluid to pump.
5. The kidneys get enough blood flow and start making urine again.
6. Once the child can drink without vomiting, you switch back to ORS by mouth and take the IV out.

SAFETY WATCH

Too much IV fluid too fast can overload the heart and lungs, especially in babies or kids with heart problems — the doctor will measure carefully. · Watch the IV site for swelling, redness, or pain — these mean the IV may have slipped out of the vein. · Once the child can drink and keep ORS down, stop the IV to avoid infection risk from the catheter.

Ondansetron · Antiemetic (anti-vomiting medicine) — serotonin 5-HT₃ receptor blocker

Ondansetron stops vomiting by blocking serotonin (a chemical messenger) from triggering the vomit center in the brainstem (the bottom part of the brain that runs automatic body jobs like breathing and throwing up). When the gut is irritated by infection, it releases serotonin, which sends a signal to the brainstem saying 'throw up now.' Ondansetron sits on the serotonin doors (5-HT₃ receptors) and blocks the signal, so the vomit reflex does not fire.

1. You give ondansetron as a dissolving tablet on the tongue, liquid by mouth, or (rarely) through an IV.
2. It travels to the brainstem and locks onto the 5-HT₃ receptors (the serotonin doors).
3. Now serotonin cannot land on those doors, so the 'vomit now' message does not get through.
4. The nausea fades and the child stops throwing up.
5. With vomiting under control, the child can sip ORS and stay hydrated.
6. Ondansetron works for about 8 hours, then the effect wears off.

SAFETY WATCH

Ondansetron can cause constipation (hard, stuck poop) for a day or two after — this is usually harmless. · Rarely, it can cause a fast or irregular heartbeat (QT prolongation) — avoid giving extra doses without asking a doctor. · Do NOT use ondansetron to hide serious warning signs: if the child has severe belly pain, bloody diarrhea, high fever, or looks very sick, get checked first — ondansetron should not delay diagnosis of appendicitis or other emergencies. · The benefit is biggest in kids who cannot keep any liquid down; do not use it routinely if the child can still sip.

Azithromycin · Macrolide antibiotic

Azithromycin kills certain bacteria by sneaking into the bacterial cell and jamming the ribosome (the bacteria's protein factory). Without new proteins, the bacteria cannot grow, repair itself, or multiply, so it dies. Azithromycin is used ONLY when a specific harmful bacterium is proven or very likely — for example, Shigella (causes bloody diarrhea and fever), severe Campylobacter (another bloody-diarrhea germ), or traveler's diarrhea from toxigenic E. coli in a sick child. Most gastroenteritis is viral and does NOT need antibiotics.

1. You give azithromycin by mouth (liquid or pill) once a day for 3–5 days.
2. It gets absorbed in the small intestine and travels through the blood to the infection site.
3. Azithromycin crosses into the bacterial cell and locks onto the 50S ribosome subunit (part of the protein-making machine).
4. The ribosome cannot read its instruction book (mRNA) anymore, so protein production stops.
5. The bacteria cannot build new cell walls, enzymes, or toxins, so it dies.
6. The immune system clears the dead bacteria, and symptoms (fever, bloody stools) start to fade in 1–3 days.

SAFETY WATCH

Common side effects: stomach cramps, nausea, or mild diarrhea (ironic but usually harmless). · Rarely, azithromycin can cause an irregular heartbeat (QT prolongation) — avoid in children with known heart rhythm problems. · Do NOT give azithromycin 'just in case' — overuse breeds resistant bacteria that antibiotics cannot kill anymore. · If diarrhea is bloody, get stool tested to confirm the germ before starting antibiotics, especially to rule out EHEC. · Finish the full course even if the child feels better — stopping early lets resistant bacteria survive.

Loperamide (in adults only) · Opioid receptor agonist — anti-diarrheal

Loperamide slows down the gut by activating opioid receptors (tiny docking stations) in the intestine wall. When these receptors turn on, the muscles in the gut relax and squeeze less often, so food and water sit longer and more water gets absorbed back into the body. Stool becomes firmer and you go to the bathroom less. Loperamide is used ONLY in adults with watery (not bloody) diarrhea and NO fever, because slowing the gut when bacteria are invading can trap the germs inside and make infection worse.

1. You swallow loperamide (pill or liquid).
2. It travels to the small intestine and colon and locks onto mu-opioid receptors in the gut wall.
3. The receptors tell the intestine muscles to relax and slow down their squeezing waves (peristalsis).
4. Stool moves more slowly, so the colon has more time to suck water back out.
5. Bowel movements become less frequent and more formed.
6. Loperamide does NOT cross into the brain much (it stays in the gut), so it does not cause drowsiness or euphoria like pain-killing opioids.

SAFETY WATCH

Do NOT use loperamide if you have bloody diarrhea, high fever (over 101.3°F / 38.5°C), or severe belly pain — these are signs of invasive infection. · Do NOT use in children under 12 years old — risk of serious gut problems (toxic megacolon, where the colon swells and can tear). · Stop loperamide if diarrhea does not improve in 48 hours or if new symptoms appear (fever, blood, worsening pain). · Taking too much loperamide (especially in teens misusing it to get high) can cause dangerous heart rhythms and death — stick to the labeled dose. · Loperamide can cause constipation, bloating, or dizziness — these are usually mild.

Zinc supplementation (in children 6 months and older) · Mineral supplement

Zinc is a mineral that helps the gut lining repair itself faster after an infection damages it. It also boosts the immune system (the body's germ-fighting team) and may reduce how much water leaks out into the stool. Giving zinc for 10–14 days during and after diarrhea has been shown in studies (especially in low-resource countries) to shorten how long diarrhea lasts and lower the chance of another episode in the next few months. Zinc does NOT kill the germ; it helps the body heal and defend itself.

1. You give zinc as a syrup or dissolvable tablet once a day for 10–14 days.
2. Zinc gets absorbed in the small intestine and travels to the gut lining cells.
3. It speeds up the production of new gut lining cells to replace the damaged ones.

4. Zinc helps enzymes (tiny protein machines) that fight infection and repair tissue work better.
5. The gut lining heals faster, so it stops leaking water and starts absorbing nutrients again.
6. Diarrhea shortens by about half a day to a day, and the risk of another bout drops.

SAFETY WATCH

Zinc can cause vomiting if the dose is too high or if given on an empty stomach — give with food or ORS. · Do NOT give more than the recommended dose (10 mg/day for infants under 6 months, 20 mg/day for older children) — too much zinc can block copper absorption and cause anemia (low red blood cells) over time. · Stop after 10–14 days; long-term daily zinc is not needed once diarrhea is gone. · Zinc does NOT help adults with acute diarrhea in the same proven way — the guideline recommendation is specific to children in low- and middle-income countries.

Red flags

- Blood in the stool or black, tarry poop
- No tears when crying, no urine for 6–8 hours, or sunken soft spot on baby's head
- Extreme sleepiness, confusion, or the child is too weak to stand or drink
- Severe belly pain that does not go away or gets worse
- High fever (over 102°F or 39°C in infants under 3 months, or over 104°F or 40°C in older children)

Nursing priorities

1. Assess dehydration status using the WHO or CDC clinical dehydration scale: check capillary refill (how fast blood comes back when you press skin), skin turgor (skin elasticity), mucous membranes (wet or dry inside mouth), tears, and urine output — Dehydration severity determines whether the child needs oral rehydration solution at home, rapid oral rehydration in clinic, or IV fluids; severe dehydration causes poor organ blood flow (perfusion) (blood flow to organs) and shock
2. Obtain accurate weight in kilograms on the same scale before and after rehydration — Weight loss is the most accurate measure of fluid deficit (how much water the body lost); each kilogram lost equals 1 liter of fluid deficit, which guides how much fluid to replace

3. Start oral rehydration therapy with WHO ORS solution: give 50-100 mL/kg over 2-4 hours for mild-to-moderate dehydration, offering small frequent sips every 5 minutes — ORS contains the right balance of glucose (sugar) and electrolytes (salts) to maximize sodium and water absorption in the intestine through the SGLT1 transporter, even when the gut is inflamed; small frequent amounts reduce vomiting
4. Monitor intake and output strictly: record every episode of vomiting and diarrhea, all oral fluids given, IV fluids infused, and urine output every void — Accurate fluid balance tracking shows whether rehydration is working or the child is falling behind; ongoing losses greater than intake mean worsening dehydration and possible need for IV therapy
5. Check vital signs every 2-4 hours: heart rate, blood pressure, temperature, and respiratory rate; watch for a fast heart rate (tachycardia) (fast heart) and low blood pressure (hypotension) (low blood pressure) — A fast heart rate (Tachycardia) is the earliest sign of hypovolemia (low blood volume); low blood pressure (hypotension) is a late dangerous sign of shock when the body can no longer compensate for fluid loss by increasing heart rate and constricting blood vessels
6. Inspect every stool for blood, mucus, color, and consistency; save a sample if blood is present or if the child appears septic — Gross blood or mucus signals invasive bacterial infection needing possible stool culture and antibiotics; watery non-bloody stool suggests viral cause that only needs supportive care; stool appearance guides diagnosis and treatment decisions
7. Watch for signs of destroying red blood cells (hemolytic) uremic syndrome (HUS): decreased urine output, pale skin (pallor) (pale skin), pinpoint bleeding spots (petechiae) (tiny red dots on skin), or sudden worsening after initial improvement, especially after E. coli O157 infection — HUS causes red blood cell destruction, kidney failure, and low platelets (clotting cells); it typically appears 5-10 days after diarrhea starts and is a life-threatening complication needing immediate nephrology consultation and possible dialysis
8. Teach caregivers strict hand hygiene with soap and water for 20 seconds after diaper changes and before food preparation; isolate the child from other children and immunocompromised family members — Gastroenteritis viruses and bacteria spread through the fecal-oral route (germs from poop getting in the mouth); hand sanitizer does not kill norovirus or C. difficile spores, but soap and water physically removes them and prevents transmission to others

Sources

- CDC Guidelines for Acute Gastroenteritis
- IDSA Clinical Practice Guidelines for Infectious Diarrhea 2017
- WHO Guidelines for Diarrhea Management in Children
- AAP (American Academy of Pediatrics) Dehydration and Diarrhea Recommendations

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