Pediatric GI, neuro, heme and renal

Dehydration, bowel blockages, febrile seizures, shunts, Reye syndrome, anemia, sickle cell, leukemia, Wilms tumor and two kidney diseases

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1 AT A GLANCE

Children have small fluid reserves, so vomiting and diarrhea dry them out fast, and a few bowel problems are true emergencies. Blood, cancer and kidney problems often start with vague signs, like pallor, bruising or puffy eyes.

Dehydration and diarrhea

- ★ Infants and children under 3 can become dehydrated quickly. Few or no tears, fewer wet diapers, dry mouth, irritability, skin that doesn't spring back, sunken eyes, a **sunken fontanelle**.
- Severe: no urine, fast heart rate and breathing, listlessness, shock. Needs IV fluids.
- ★ Keep breastfeeding; mix formula full strength. **Oral rehydration solution, about an ounce every 30 to 60 minutes; don't water it down.** If the baby vomits: a teaspoon every 10 to 15 minutes, no solids.
- Avoid sports drinks for young infants, apple and full-strength juices, dairy and fried foods. No antidiarrheal medicine unless the provider says so.
- Call: diarrhea in a baby under 3 months; no wet diaper for 6 hours, no tears, a sunken soft spot; more than 8 stools in 8 hours; vomiting over a day; blood or mucus in the stool. Call 911 for loss of consciousness, confusion or seizures.

Febrile seizures

- A convulsion triggered by fever, most often between 6 months and 5 years. Usually in the first 24 hours of an illness, not always when the fever is highest.
- Not typical: a seizure in one part of the body, or one that repeats in the same illness. In young children with a first seizure, meningitis must be ruled out.
- ★ **During any seizure: don't hold the child down, don't leave, put nothing in the mouth.** Lay the child on the floor in a safe area, clear sharp objects, loosen tight clothing. Turn to the side if vomiting or secretions build up.
- Fever medicine eases the child, but doesn't prevent future febrile seizures. Simple febrile seizures don't cause brain damage or epilepsy; most children outgrow them by age 5.

Three blockages

	Pyloric stenosis	Intussusception	Hirschsprung disease
Usual age	Around 3 weeks (1 week to 5 months)	5 months to 3 years	Present at birth
What	Thick pyloric muscle blocks the stomach from emptying; more common in boys	One part of the bowel slides into another, cutting off blood flow	Nerves missing from part of the large bowel; more common in boys and with Down syndrome
★ Key sign	**Projectile vomiting, hungry right after.** Wave-like belly motion; **olive-shaped mass** in the upper belly	**Colicky pain, knees drawn up, currant jelly stools.** Pain returns stronger and longer each time	**No meconium within 24 to 48 hours**, swollen belly. Older child: constipation that slowly worsens
Care	Pyloromyotomy cures it; small, frequent feedings within hours	**An emergency.** NG tube and IV fluids, then an air or contrast enema, or surgery. It can come back	Rectal biopsy confirms. Rectal irrigation, then surgery. Watch for enterocolitis: swollen belly, foul, watery diarrhea

Brain and spine

	Look for	Care
★ Bacterial meningitis	Fever, vomiting, light sensitivity, severe headache, mental status changes. **Babies: bulging fontanelle, poor feeding, irritability**, fast breathing; some arch backward (opisthotonos)	An emergency. You can't tell bacterial from viral by symptoms, so any suspicion goes to the emergency department. A lumbar puncture tests the spinal fluid
★ Hydrocephalus	Infant: soft spot bulges, head grows larger than expected, sutures separate, setting-sun eyes. Irritability, vomiting, high-pitched cry	Measure head circumference over time. A V-P shunt drains the fluid. **Blocked shunt: headache and vomiting**
Myelomeningocele	A sac on the lower back; leg weakness or paralysis, lost sensation, bladder and bowel problems. Eight in ten also have hydrocephalus	Repair usually in the first few days. Until then, **handle carefully to protect the exposed cord**. Folic acid helps prevent it
★ Reye syndrome	Brain and liver damage linked to aspirin during chickenpox or the flu. Persistent vomiting, then confusion, lethargy, seizures, coma	**No aspirin or other salicylates, like bismuth subsalicylate, unless the provider says so**
Cerebral palsy	Delayed milestones, usually before age 2. Spastic type: tight muscles, scissoring, toe-walking gait	No cure: therapists, braces, and medicines for spasticity and seizures support independence

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1 AT A GLANCE, CONTINUED

Anemia and sickle cell

- ★ Iron deficiency is the most common anemia in children. **Too much cow's milk** means less iron absorbed. Pallor, irritability, tiredness, brittle nails, pica.
- Iron-rich foods: meats, beans, eggs, green leafy vegetables. **Iron only as prescribed: too much is toxic to children.** Oral iron is usually 3 to 6 mg/kg a day of elemental iron, in 1 or 2 doses.
- Sickle cell disease is inherited from both parents; one gene gives the trait, without symptoms. Sickled cells block vessels: pain crises.
- ★ **Crisis: pain medicine and plenty of fluids**, sometimes a transfusion. Daily folic acid, hydroxyurea, preventive antibiotics, Hib and pneumococcal vaccines. **Fever of 101.3 °F (38.5 °C) or higher: emergency.**

Leukemia and Wilms tumor

- ★ Acute lymphoblastic leukemia: the most common childhood cancer, usually at ages 3 to 7. Bone and joint pain, easy bruising, petechiae, pallor, fever, swollen lymph nodes.
- A bone marrow biopsy and a lumbar puncture help diagnose it. Low neutrophils, especially under 500 cells per microliter: strict hand hygiene, limit visitors, report any fever at once.
- Wilms tumor, kidney cancer, usually around age 3 or 4: a belly mass or swelling, belly pain, blood in the urine, high blood pressure.
- ★ **Once Wilms tumor is suspected, don't press on the belly**; handle and bathe the child gently.

Two kidney diseases

	Nephrotic syndrome	Post-strep glomerulonephritis
Typical child	Ages 2 to 6; usually minimal change disease	Ages 6 to 10; 1 to 2 weeks after strep throat, or 3 to 4 weeks after a skin infection like impetigo
★ Urine and signs	**Foamy urine, heavy protein. Heavy swelling, first in the face and around the eyes**; high cholesterol	**Rust-colored or bloody urine, less urine, high blood pressure.** Swelling often worst in the face
Treatment	Steroids. A low-sodium diet and diuretics ease swelling	Penicillin, blood pressure medicine, diuretics, less salt; steroids generally don't help. Watch for heart failure, fluid in the lungs, high potassium

Cleft lip and palate, celiac disease

	Key points
Cleft lip and palate	Feeding problems (milk through the nose), poor weight gain, ear infections, hearing and speech problems. Lip repaired at 2 to 9 months, palate within the first year. Follow-up: speech therapy, orthodontics, repeated hearing tests
★ Celiac disease	Autoimmune reaction to gluten that damages the small intestine. **Gluten: wheat, rye, barley, possibly oats.** Diarrhea or constipation, fatty, foul stools, poor weight gain. **Lifelong gluten-free diet**; read food and medicine labels

2 PRIORITY AND SAFETY CALLS

★ Intussusception is an emergency: the bowel can die or tear, and shock can follow quickly. Stabilize with an NG tube and IV fluids.

No wet diaper for 6 hours and no tears: dehydration signs, so the baby needs the provider now.

★ Shunt: get emergency care for extreme sleepiness, a high-pitched cry, seizures, fever or a stiff neck.

Wilms tumor: don't palpate the abdomen; handle and bathe gently.

Hypospadias: don't circumcise the baby, because the foreskin is used for the repair (usually at 6 to 12 months).

3 EXAM ANCHORS

1. Traps: sports drinks or juice for an infant, antidiarrheal medicine, assuming regular oats are gluten-free.
2. Febrile seizures: usually harmless; side-lying, nothing in the mouth. No aspirin for children.
3. Traps: something in the mouth during a seizure, and blaming shunt-failure vomiting on a stomach bug.
4. Nephrotic: protein and puffy eyes; post-strep: rust-colored urine and high pressure.
5. Traps: palpating a Wilms tumor, iron without a prescription, circumcising a baby with hypospadias.

4 SELF-QUIZ

1. Pyloric stenosis usually shows around _____ weeks of age.
2. Gluten is in wheat, rye, barley and possibly _____.
3. Febrile seizures: most often 6 months to _____ years.
4. A blocked shunt brings headache and _____.
5. Sickle cell trait comes from _____ gene, without symptoms.
6. Nephrotic syndrome in children is usually from _____ disease.

ANSWER KEY 1. 3 · 2. oats · 3. 5 · 4. vomiting · 5. one · 6. minimal change

5 SOURCES

1. MedlinePlus, Diarrhea in infants. medlineplus.gov/ency/patientinstructions/000691.htm
2. MedlinePlus, Intussusception - children. medlineplus.gov/ency/article/000958.htm
3. MedlinePlus, Febrile seizures. medlineplus.gov/ency/article/000980.htm
4. MedlinePlus, Sickle cell disease. medlineplus.gov/ency/article/000527.htm
5. MedlinePlus, Wilms tumor. medlineplus.gov/ency/article/001575.htm
6. MedlinePlus, Nephrotic syndrome. medlineplus.gov/ency/article/000490.htm

Built from RN PocketPal course lessons: Pediatric GI conditions and fluid balance (c18-l04); Pediatric neurological conditions (c18-l05); Pediatric hematology, oncology and renal conditions (c18-l07). Every line on this sheet comes from those lesson scripts.

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