Gastroenteritis

Gastroenteritis is a common disease, usually of viral origin, that inflames the stomach and small intestine. It is characterized by diarrhea and/or vomiting, with or without fever. Most children seeking emergency department (ED) care have no/minimal dehydration. The focus of treatment should be on promoting oral rehydration therapy and minimizing the use of intravenous rehydration.

Diagnostic Considerations

- While nearly 40% of cases present with isolated vomiting[1] (most commonly caused by norovirus), **carefully consider** other causes of isolated vomiting in children:
  - Surgical, infectious (e.g., UTI), CNS or metabolic disorders (e.g., DKA)
- Pathogen identification is not routinely required. Send stool for bacterial testing (molecular or culture) in children with bloody diarrhea, diarrhea lasting >5 days, and in returning travelers. Children with isolated diarrhea without vomiting are more likely to have a bacterial etiology.[2]
- Stool parasite testing has a low yield in the ED; consider testing in children with risk factors (e.g., returning travelers, contact with farm animals, or exposure to untreated water sources).

Assessing Dehydration[3]

- Dehydration assessment is the cornerstone of management. The degree of dehydration is *categorized* since accurately *quantifying* percent dehydration can be very difficult.
- If a recent weight is available, use it as the gold standard to calculate % weight loss.
- Practitioners with limited experience assessing dehydration in children should use a clinical scale such as the Gorelick Score[4] or Clinical Dehydration Scale Score[5] to rule out dehydration. These scores have high sensitivity but low specificity.
- Take time to communicate your evaluation to caregivers/patients as this can be a source of anxiety.

Table 1: Dehydration Severity Signs and Symptoms

Minimal Dehydration	Mild–Moderate Dehydration	Severe Dehydration
– No visible clinical signs of dehydration – Urine slightly darker, mildly reduced	– Less frequent urination – Sunken eyes – Dry oral mucosa – Reduced activity	– Tachycardia, tachypnea – Greatly reduced or absent urine output – Lethargy – Sunken eyes – Dry oral mucosa

Treatment Depends on Hydration Status[6,7]

MINIMAL DEHYDRATION – CAN BE MANAGED AT HOME

- Encourage and allow children to drink their preferred fluids & continue an age-appropriate diet.
- If vomiting is present, frequent small amounts of fluid can often be tolerated.
- If vomiting is absent, children should be encouraged to eat a normal diet.

MILD–MODERATE DEHYDRATION – TREAT IN THE ED

- Within 2-4 hours of presentation to the ED. rapidly replace fluid deficit orally with **50-100 mL/kg** of:
  - Oral Rehydration Solution (ORS) (e.g., Pedialyte®, Pediatric Electrolyte®), and/or
  - Preferred fluids (e.g., electrolyte-containing sports drinks, diluted apple juice, ORS popsicles), and/or
  - Breastfeeding using more frequent and shorter sessions.
- Aim to administer **"1-2-3 ounces"**:

6 months - <5 years:	30 mL per 10 minutes
5-10 years:	60 mL per 10 minutes
>10 years:	90 mL per 10 minutes

- Administer additional fluids to replace ongoing losses (vomiting and/or diarrhea).
- Observe children in the ED until they are tolerating fluids and demonstrate improved clinical status.
- Nasogastric rehydration with ORS at 50 mL/kg divided over 3 hours is an alternative option.
- Intravenous hydration is rarely needed, does not improve outcomes, and is associated with repeat ED visits.
- Reintroduce solids as soon as possible (e.g., 6 hours after the last vomit episode), but focus should remain on fluid intake.

SEVERE DEHYDRATION

- Administer immediate rehydration with NS or RL 20 mL/kg bolus IV/IO over 10-20 minutes and repeat as needed to restore hemodynamic stability.
  - **Often requires ≥ 60 mL/kg, administered as 20 mL/kg boluses, over the first hour**
- Measure glucose, electrolytes, and renal function. Treat hypoglycemia if present.
- Reassess vital signs and hydration status before and after each bolus.
- Once child is hemodynamically stable, reintroduce oral fluids and discontinue IV.
  - If unable to adequately perform oral rehydration therapy, start maintenance IV fluids with isotonic/balanced crystalloid including adequate dextrose and potassium as required (e.g., D5NS or D5LR + 20-40 mmol/L KCl).
- Consult Pediatrics/Pediatric Referral Centre for children with significant hypo/hypernatremia.

Ondansetron

- Ondansetron is safe, cost-effective and enhances the success of oral rehydration in children with "some" dehydration treated in the ED.[8]
- Weight-based ondansetron dosing regimen:

8 - 15 kg:	2 mg PO
>15 - 30 kg:	4 mg PO
>30 kg:	8 mg PO

- While ondansetron elixir (0.15 mg/kg) can be used in infants 3-6 months of age, it is rarely needed in this age group and should be used only after alternative diagnoses have been excluded.
- Oral dissolving tablets (ODT) are preferred over regular tablets/liquid formulations due to ease of administration.
- Providing 2 additional doses of ondansetron to be taken Q8H PRN at home to children with vomiting within the past 6 hours and ≥3 episodes in the past 24 hours improves outcomes.[9]
- **Do not** use IV ondansetron due to the risk of QTc prolongation and lack of benefit over the oral route.
- **Do not** use dimenhydrinate due to no evidence of benefit reported in clinical trials.
- **Do not** use antidiarrheal medications and do not administer antibiotics empirically.

Hypoglycemia

- Perform point-of-care glucose testing in any child with lethargy or altered mental status.
  - If glucose ≤ 2.6 mmol/L: treat with **5 mL/kg D10W IV push** and recheck in 5-10 minutes.
  - Alternatively, the hypoglycemia can be treated orally if the child can tolerate ORS or an alternative fluid option, as above.

Criteria for Hospital Admission

- Severe dehydration or significant electrolyte abnormalities
- Dehydration and intractable vomiting, oral fluid refusal, or inadequate oral fluid intake
- Worsening diarrhea or dehydration despite adequate volumes of fluid
- Concern for other possible illnesses complicating the clinical course
- Young infant, persistent irritability or drowsiness, progressive symptoms or significant past medical history
- Caregiver requires or would benefit from hospital-based supports to care for child

Parent Resources

- Counsel caregivers on care at home and reasons to return to the ED. Parent and family resources related to gastroenteritis can be accessed at trekk.ca/parentsandfamilies.

Scan or click the QR code to learn more and to see a full list of references and development team members