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Gastroenteritis: Acute Management

Link to Flow Diagram

Aim To provide an evidenced based guide to assist in the management of acute gastroenteritis in the emergency department.

Background:

- Infectious gastroenteritis causes diarrhoea with or without vomiting (non-bilious) or cramping abdominal pain. Usually the vomiting lasts 1-2 days and diarrhoea 5-7 days.
- A range of enteric viruses, bacteria and protozoal pathogens may be responsible[1].
- Many cases can be managed with oral rehydration and in general enteral is preferable to intravenous rehydration[2,3].
- Shocked (definition box below) children require urgent resuscitation with 20ml/Kg bolus of IV 0.9% NaCl[4].
- Remember to cease fortified formulas (e.g. concentrated feeds or caloric additives) during the acute illness.

Target Patient Population

Patients attending the Emergency Departments at Crumlin, Temple Street and Tallaght.

Target Users

Doctors and nurses in CHI emergency departments and urgent care centres (UCC).

Assessment

Is the diagnosis correct?[5] Any recent hiking/travel? Have they received the rotavirus vaccine?

RED FLAGS: Consideration of differential diagnoses and review by a senior doctor if: [6 7 8]

- Severe/localised abdominal pain or abdominal signs
- Persistent diarrhoea (> 10 days)
- Blood in stool
- Looks very unwell or altered consciousness
- Bilious (green) vomit
- Vomiting without diarrhoea (potential risk misdiagnosis)
- Age <6 months
- Short gut syndrome/Ileostomy
- Complex/cyanotic congenital heart disease
- Renal insufficiency or adrenal insufficiency
- Failure to Thrive/malnutrition
- Metabolic Conditions
- Specific cases e.g. sickle cell disease
- Transplant patients (bone marrow, renal, heart, liver, etc) or Immunosuppression
- Certain medications e.g. chemotherapy, diuretics, iron chelation (Yersinia)
- Fortified feeds (concentrated feeds or caloric additives)
- Repeated presentations for same/similar symptoms

Differential diagnoses of vomiting/diarrhoea:[11]	
Non-GI infections	Sepsis, Pneumonia, Urinary tract infection, Meningitis,
Non-infectious	Overflow diarrhoea, Toddler diarrhoea,
Surgical	Volvulus, Obstruction, Appendicitis, Abscess, Adhesions
Endocrine	Diabetic ketoacidosis, Adrenal insufficiency
Renal	Haemolytic uremic syndrome, Nephrolithiasis (severe pain)
Neurological	Hydrocephalus with shunt complications, Raised ICP
Drugs and toxins	Antibiotics, Anti-epileptics, Opiates, Chemotherapy, Laxatives, Iron chelators
Injury	Head injury
Metabolic	1st presentation

Dehydration %	Mild 3-5%	Moderate 6-10%	Severe >10%/Shocked
Mental status	Normal	Listless, irritable	Lethargy, altered
Heart rate	Normal	Increased	Increased
Quality of pulses	Normal	Normal/decreased	Decreased/thready
Capillary refill	Normal	Prolonged >3sec	Prolonged >3sec
Blood pressure	Normal	Normal	Normal/decreased
Respirations	Normal	Tachypnoea	Tachypnoea
Eyes	Normal	Slightly sunken, decreased tears	Sunken, no tears
Fontanelle	Normal	Sunken	Sunken
Urine output	Normal/decreased	Decreased	Oliguric/anuric

Investigations

- **Most cases require no investigations**.
- Glucose on finger prick sample in triage and if hypoglycaemic (glucose <2.6) (link to hypoglycaemia guideline) check serum ketones if the patient is hypoglycaemic.
- **Only** culture faecal samples if a bacterial source/septicaemia suspected i.e., significant associated abdominal pain, blood +/ mucus in stools, immunocompromised (e.g. sickle cell disease, transplant) [4]. Results usually don't alter treatment[12 13].
- Urine samples are not always needed, especially if active diarrhoea.

Blood tests required if:[14 15]
Severe dehydration or suspected/confirmed shock (box above)
Co-morbidity e.g. renal disease/ileostomy
Certain medications e.g. diuretics
Altered conscious state
Signs of hypernatraemia: jittery movements, hypertonia, hyperreflexia, 'doughy skin', seizures, drowsy/coma
Home therapy with excessive hypertonic fluids (e.g. homemade solutions with added salt) or excessively hypotonic (e.g. prolonged plain water/diluted formula)
Profuse or prolonged losses
Contraindicated/failed nasogastric tube rehydration

Management (link to flow diagram)

Ondansetron for acute gastroenteritis/nausea and vomiting

Prescribing guidance (Unlicensed use) - Refer to CHI formulary.

Weight	ORAL ONLY	IV/PO
<10kg	0.15mg/kg (max 2mg) TDS OR 2mg BD	0.1mg/kg TDS (max 1mg)
10-40kg	0.15mg/kg (max 6mg) TDS OR 4mg BD	0.1mg/kg TDS (max 4mg)
>40 kg	0.15mg/kg (max 8mg) TDS OR 8mg BD	0.1mg/kg TDS Maximum dose: 4mg may be sufficient; higher doses of up to 8mg can be used if required .

Slow IV injection over 2-5 minutes

- This table is for use when the indication falls outside of BNFC guidance. For PONV please see BNFC.
- Limited data for use in <1 month. Lowest licensed age group (for PONV) is 1 month old.
- To be used in conjunction with appropriate rehydration
- Should be reviewed regularly and discontinued at earliest opportunity. Prolonged use not recommended.
- Ondansetron should not be prescribed IM for paediatrics
- Caution in congenital long QT syndrome– use ECG monitoring for patients with added risk such as hypokalaemia, hypomagnesaemia, concurrent QT prolonging medications etc.

*** Oral bioavailability is 60%, therefore higher oral doses can be necessary. **Do not** prescribe higher dose range as PO/IV

Oral Rehydration therapy (ORT):[16] [17]

- Continue breastfeeding and other milk feeds. Stop any fortified feeds. Avoid carbonated drinks e.g. 7UP or sports drinks. Encourage parents to find methods to help children e.g. cup/syringe.
- Ondansetron: **only** if vomiting and diarrhoea. Only given once in this instance[18] [19]. If only vomiting, discuss with a senior.
- If given ondansetron wait 30 minutes before commencing an oral fluid trial.
- If diarrhoea is the main symptom, ondansetron may not be needed.
- Monitor the response by regular clinical assessment[20].
- Not applicable for dehydration from respiratory illnesses e.g. bronchiolitis/electrolyte imbalances which may require a specific fluid plan (Risk of syndrome of inappropriate antidiuretic hormone secretion (SIADH)).
- Early feeding (as soon as rehydrated) reduces stool output and aids gastrointestinal tract recovery.
- Most with mild/no dehydration can be discharged without a trial of fluids after appropriate advice and follow-up arranged**.** If not, initial management is a trial of ORT in the emergency department.
- Advise low osmolality (240-250mOsml/L) oral rehydration solution (ORS)[21] e.g. Dioralyte or half diluted apple juice (50:50 with water)[22]. Aim:10-20ml/Kg fluid over 1 hour; frequent small amounts.
- If refusing Dioralyte/apple juice and no red flags consider supplementation with their usual fluids (i.e. milk).

- Consider early nasogastric tube rehydration if significant ongoing GI losses (frequent vomiting/profuse diarrhoea) which minimise the chance of success at home and/or moderate dehydration.

Nasogastric Tube Rehydration (NGTR) [24]

- Is safe and effective, even if vomiting, for most with moderate dehydration. Most will stop vomiting after NGTR started.
- Suitable until ~2 years of age
- Fluid used: Dioralyte (ORS).
- If persistent vomiting: slow NG fluids temporarily and consider ondansetron.

Rapid NGTR: 25ml/Kg/hr over 4 hours (total 100ml/kg)[25]

- Suitable: age >6 months with moderate dehydration and no comorbidities.
- If continued significant vomiting (2 large vomits in 1 hour) or significant abdominal pain during, re-examine and consider differential diagnoses e.g. development of ileus.
- If normal examination, then halve rate of NGT fluids and consider admission.

Slower NGTR: replace deficit over first 6 hours, then daily maintenance over the next 18 hours.

- Indications: age <6 months, comorbidities, significant abdominal pain.
- If vomiting continues despite reduced rate/profuse ongoing diarrhoea: IV fluids are likely needed.

Intravenous Rehydration:[26 27 28]

- Indications: suspected/confirmed shock, red flag symptoms showing clinical deterioration, severe dehydration, contraindicated/failed NGTR.
- Obtain weight before IV fluids commenced.
- **If shocked**: initial bolus of 20ml/kg 0.9% NaCl, consider differential diagnoses and reassess.
- If hypoglycaemic check ketones and manage as per hypoglycaemia guideline (insert link).
- If non responsive shock (little or no improvement), >40 ml/kg boluses given or hyper/hyponatraemia: involve senior staff and ICU.
- When resolution of signs and symptoms of shock: start rehydration with IV therapy (5% glucose & 0.9% NaCl for maintenance, deficits and ongoing losses).
  Deficit in millilitres (ml): *% Dehydration X Weight (kg) X 10*.
- Measure sodium, potassium, urea, creatinine and glucose at the outset and alter fluid composition/rate if necessary.
- Fluid balance chart documenting input, ongoing losses and urine output (minimum 0.5ml/kg/hr).
- Consider septic work-up or surgical consult in severely unwell patients.
- Monitor for signs of oedema: skin may appear stretched, puffy, shiny, pitting (may be localised to dependant areas), increasing weight, tachypnoea.

Standard IV Rehydration: rehydration fluid calculated over the first 24 hours/ hourly rate[29].

- *100/50/20 rule*: (100 ml for each of the first 10kg) + (50ml for each kg 11-20) + (20 ml for each additional kg) / 24 hours = hourly rate.
- Alternatively, *4/2/1 rule*: (4ml/kg for the first 10kg) + (2ml/kg for kg 11-20) + (1ml/kg for every kg above 20) = hourly rate.

Post rehydration: full-strength milk straight away and re-introduce usual solid foods. Avoid carbonated drinks/fruit juices until after the diarrhoea has stopped. Advice regarding temporary lactose intolerance.

Discharge requirements:

- If available nurse led discharge should be considered for eligible ED or SSOU admissions
- Advice and parental information sheet on gastroenteritis should be provided before discharge.

Special Considerations

Consider admission:

- Ongoing signs of dehydration or otherwise unwell
- Worsening abdominal pain
- Persistent vomiting
- Complex background history and not improving
- Abnormal blood results e.g. electrolyte imbalance, high urea, etc.

Companion Documents

Link to: Parental information sheet, nurse led discharge

Links to useful websites

- Royal Children's Hospital Melbourne, Acute gastroenteritis Management guidelines

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