Vomiting

Essential History

Ask about:

- Age of patient
- Duration of symptoms
- Frequency, colour, force of vomiting
- Weight loss
- Feeding history in infants
- Systemic history, including:
  - Fever
  - Symptoms of infection
- Presence of abdominal pain
- Loose stools / diarrhoea
- Urinary symptoms
- Neurological symptoms including headaches
- Drug history
- Menstrual history
- Psychosocial history

'Red Flag' Symptoms and Signs

Ask about:

- Bilious vomiting
  - In a neonate, consider bowel obstruction – a surgical emergency (see Acute Surgical Abdomen)
- Projectile vomiting
  - Pyloric stenosis
  - Increased intracranial pressure
    - May take place in the absence of nausea or retching
- Somnolence, drowsiness or lethargy
  - Drug overdose
    - Especially with paracetamol (acetaminophen), aspirin, ferrous sulfate, alcohol and recreational drugs
    - Meningoencephalitis
  - Inborn errors of mitochondrial fatty acid oxidation
- Associated headaches and timing (eg, worse on waking)
  - Intracranial pathology

- Persistent vomiting
  - In a neonate or young infant who has no evidence of infection:
    - Congenital gastrointestinal anomaly
    - Inborn error of metabolism
    - Central nervous system abnormality
      - Hydrocephalus or subdural effusion (eg, raised intracranial pressure)

Look for:

- Signs of dehydration or shock (see Diarrhoea and vomiting in children overview [NICE pathway], Diarrhoea and vomiting in children: Diarrhoea and vomiting caused by gastroenteritis: diagnosis, assessment and management of children younger than 5 years [NICE clinical guideline CG84, section 1.2] and Gastroenteritis [NICE clinical knowledge summary])
  - Tachycardia
  - Mottled / pale appearance
  - Prolonged capillary refill time / poor perfusion / cool peripheries
- Altered conscious level
- Signs of meningitis
  - Irritability
  - Neck stiffness
  - Bulging fontanelle (’soft spot’)
  - Non-blanching rash
- Signs suggestive of raised intracranial pressure
  - Cushing’s triad
    - Hypertension
    - Bradycardia
    - Irregular respirations
  - Abnormal neurological examination including on cranial nerve assessment or fundoscopy
- Blood and / or mucus in stool (see Melaena / Bleeding Per Rectum)
- Severe or localised abdominal pain
- Abdominal distension or rebound tenderness
- Presence of an abdominal mass
- Visible peristalsis across the abdomen approximately 30–40 minutes post feed in infants
  - Pyloric stenosis

Differential Diagnosis / Conditions

Causes of vomiting are listed by usual age of earliest occurrence.

Infancy / early childhood:

- Congenital
  - Gastro-oesophageal reflux
    - Mild / moderate
    - Severe with complications, including:
      - Oesophagitis with or without anaemia secondary to blood loss or stricture
      - Recurrent apnoea
      - Aspiration pneumonia
      - Faltering growth
  - Conditions causing obstruction
    - Atresia / stenosis
      - Trachea-oesophageal fistula
      - Intestinal atresia
    - Antral web
    - Annular pancreas
    - Volvulus
    - Meconium ileus (cystic fibrosis), meconium plug
    - Hirschsprung's disease
- Acquired conditions
  - Intussusception
  - Incarcerated hernia
  - Pyloric stenosis
  - Allergy to cow's milk protein
  - Acute infectious gastroenteritis
  - Postviral gastroparesis
  - Neonatal necrotising enterocolitis
  - Food allergy
  - Eosinophilic oesophagitis
  - Coeliac disease
- Infectious non-gastrointestinal conditions
  - Otitis media
  - Urinary tract infection
  - Pneumonia
  - Upper respiratory tract infection
  - Sepsis

  - Meningitis
- Central nervous system conditions:
  - Trauma (see Head Injuries)
  - Tumour
  - Infection
  - Autonomic responses
    - Pain
    - Shock
- Metabolic conditions:
  - Aminoaciduria and organic aciduria
  - Galactosaemia
  - Fructosaemia
  - Adrenogenital syndrome
  - Renal tubular acidosis
  - Hyperammonaemia
  - Disorders of fatty acid oxidation (eg, medium-chain acyl-coenzyme A dehydrogenase deficiency)
  - Mitochondrial disease

Childhood / adolescence — most of the above remain considerations, with additional possible causes

- Gastrointestinal conditions
  - Appendicitis
  - Food poisoning
  - Peptic ulcer disease
  - Trauma (eg, perforation)
  - Pancreatitis
  - Gallbladder disease
  - Crohn’s disease
  - Adhesions
  - Visceral neuropathy or myopathy
  - Superior mesenteric artery syndrome
- Medications
  - Opiate analgesics, antibiotics, NSAIDs, steroids, antimuscarinics
  - Idiosyncratic reaction (eg, paracetamol at therapuetic doses)
  - Chemotherapy and radiation therapy
  - Overdose (especially aspirin or paracetamol)
- Central nervous system and / or mental health conditions
  - Cyclical vomiting
  - Migraine (see Headache)

  - Anorexia nervosa (see Appetite Loss)
  - Bulimia nervosa
- Alcohol
- Motion sickness
- Metabolic conditions
  - Diabetic ketoacidosis
  - Acute intermittent porphyria
- Pregnancy

Investigations

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team), or specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)):

- Urinalysis in babies and small children, and in older children depending on the presentation
- Pregnancy test in menstruating girls, whatever the age
- Stool for microbiology, culture, and sensitivity (MC&S) if appropriate
- Blood sugar on capillary sample if available

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)):

- Blood tests, including:
  - Full blood count
  - Blood sugar
  - Biochemistry
  - Blood cultures
  - Blood gas
- Metabolic acidosis raises concerns about underlying metabolic disorder or drug intoxication
- Further workup for metabolic or neurological disease should be considered, as appropriate
- Imaging
  - In an infant, consider ultrasound of the abdomen for pyloric stenosis
  - Abdominal X-ray (for gas pattern) and / or chest X-ray
  - Upper gastrointestinal contrast study
    - Volvulus
    - Malrotation
  - Computed tomography of the head or magnetic resonance imaging if brain tumour is a consideration

Treatment Approach

Management of the vomiting depends on the possible underlying diagnosis.

To be undertaken by non-specialist practitioners (eg, GP Team), or specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)):

- Acute intercurrent vomiting without serious underlying disease or significant dehydration should be treated by administering clear liquids by mouth (eg, in acute gastroenteritis or otitis media) (see Diarrhoea and vomiting in children overview [NICE pathway], and Gastroenteritis [NICE clinical knowledge summary])
- Babies who are breast fed should continue to do so
- If vomiting is associated with diarrhoea and dehydration
  - Oral rehydration solution is indicated
- Gastro-oesophageal reflux treatment must be individualised (see Gastro-oesophageal reflux disease: recognition, diagnosis and management in children and young people [NICE clinical guideline NG1] and Gastro-oesophageal reflux disease (GORD) in children [NICE clinical knowledge summary])
  - The extent of treatment depends on the presence of any of the complications of reflux
  - Medical management includes thickening of feeds with cereal
  - Do not use positional management to treat GOR in sleeping infants. In line with NHS advice, infants should be placed on their back when sleeping.
  - Older children should also:
    - Avoid snacks or liquids after dinner
    - Refrain from / reduce agents that exacerbate oesophagitis such as:
      - Alcohol
      - Caffeine
      - Smoking
  - Medications can also be used to decrease exposure of the oesophageal mucosa to acid
    - Antacids
    - H_2-receptor blockers
    - Proton-pump inhibitors
  - In children who have psychomotor retardation and gastro-oesophageal reflux
    - Antireflux surgery may be required
      - May not eliminate respiratory symptoms
- Abdominal migraine (see Migraine in 12–17 year olds [NICE clinical knowledge summary]) may be treated with medication such as:
  - Propranolol hydrochloride
  - Amitriptyline hydrochloride

  - Topiramate
- Treat urinary tract infection if diagnosis apparent (see Urinary tract infection in children: Diagnosis, treatment and long-term management [NICE clinical guideline CG54])
- Treat other infections as appropriate
  - Antibiotics may be required
- Antiemetic drugs
  - Should be avoided in infants, but may at times be useful in older children
  - Should be avoided in suspicion of gastrointestinal obstruction
  - Do not appear to have a role in the management of acute viral gastroenteritis
  - Those used most commonly for acute symptoms are ondansetron and promethazine hydrochloride
  - Ondansetron, cyclizine and metoclopramide hydrochloride (caution in young people) are first-line choices for chemotherapy induced nausea and vomiting.

To be undertaken by specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)):

- Mild to moderate dehydration may be corrected by oral hydration (eg, via nasogastric tube if necessary) (see Diarrhoea and vomiting in children: Diarrhoea and vomiting caused by gastroenteritis: diagnosis, assessment and management in children younger than 5 years [NICE clinical guideline CG84, section 1.3.2])
  - Significant vomiting that requires intravenous fluid therapy is usually associated with hypochloraemic alkalosis with secondary hypokalaemia
- Motion sickness can be helped by:
  - Cinnarizine
  - Hyoscine hydrobromide
  - Promethazine teoclate

When to Refer

Refer urgently to specialist practitioners (eg, Emergency Department / Paediatric / Paediatric Gastroenterology Team(s)) if:

- Vomiting with signs of dehydration
- Persistent vomiting
- Recurrent episodes of vomiting
- Weight loss or faltering growth

Escalate care to specialist practitioners (eg, Paediatric / Paediatric Surgery / Neurosurgery / Paediatric Gastroenterology Team(s)) if:

- Vomiting in association with symptoms or signs of:
  - Acute abdomen (eg, obstruction, appendicitis)
  - Raised intracranial pressure or other possible neurological problem
  - Metabolic derangement

'Safety Netting' Advice

- Any child who is sent home after evaluation should be given written advice on:
  - When to return
  - What parents should look for, including:
    - Signs of dehydration
    - 'Red flag' symptoms
- Children should be excluded from nursery or school according to local protocols

Patient / Carer Information

Please note: whilst these resources have been developed to a high standard they may not be specific to children.

1. Vomiting in children and babies (Web page), the NHS website
2. Gastroenteritis in children (Web page), the NHS website
3. Does your child have a serious illness? (Web page), the NHS website
4. Reflux in babies (Web page), the NHS website
5. Gastroenteritis in children (Web page), Patient
6. Food poisoning in children (Web page), Patient
7. Nausea and vomiting (Web page), Patient
8. Rotavirus (Web page), Patient
9. Migraine in children (Web page) Patient

Resources

National Clinical Guidance

Diarrhoea and vomiting in children overview (Web page), NICE pathway, National Institute for Health and Care Excellence.

Diarrhoea and vomiting in children: Diarrhoea and vomiting caused by gastroenteritis: diagnosis, assessment and management in children younger than 5 years (Web page), NICE clinical guideline CG84, National Institute for Health and Care Excellence.

Gastro-oesophageal reflux disease: recognition, diagnosis and management in children and young people (Web page), NICE clinical guideline NG1, National Institute for Health and Care Excellence.

Nausea and vomiting(Web page), HeadSmart: be brain tumour aware.

Urinary tract infection in children: Diagnosis, treatment and long-term management(Web page), NICE clinical guideline CG54, National Institute for Health and Care Excellence.

Suggested Resources

Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.

Gastroenteritis (Web page), NICE clinical knowledge summary, National Institute for Health and Care Excellence.

Gastro-oesophageal reflux disease (GORD) in children(Web page), NICE clinical knowledge summary, National Institute for Health and Care Excellence.

Migraine in 12-17 year olds (Web page), NICE clinical knowledge summary, National Institute for Health and Care Excellence.

Dehydration (Web page – requires log-in), Spotting the Sick Child.

Abdominal Pain (Web page – requires log-in), Spotting the Sick Child.

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