

Oedema

Definition / Supporting Information

Oedema ('swelling or puffiness') is the accumulation of fluid in the interstitial tissues.

Keywords / also known as: dropsy, excess fluid, fluid overload, fluid retention, swollen tissue

Essential History

Ask about:

- Weight gain
 - Tight clothing / snug-fitting shoes
- Recent illness, such as pharyngitis
 - May indicate glomerulonephritis
- Nutritional status
- Whether the oedema is affected by position / time of day, and whether the patient has been lying down (sacral oedema) or standing (feet and lower legs)
- Fever
 - May be present with cellulitis
- Medication history
- Allergy
- Congenital heart disease

'Red Flag' Symptoms and Signs

Ask about:

- Shortness of breath (see Dyspnoea) / tachypnoea / cough
 - May indicate the presence of heart failure and / or pulmonary oedema
- Reduced urine output

Look for:

- Localised oedema
 - Rash / urticaria / mouth or tongue swelling / respiratory compromise / wheeze
 - Allergy / anaphylaxis
 - Deep venous thrombosis
 - Cellulitis

- Burn
- Generalised oedema
 - Includes scrotal or labial oedema
 - Periorbital oedema
 - Nephrotic syndrome / glomerulonephritis
- Tachypnoea / crackles or wheeze
 - May indicate pulmonary oedema
- Increased blood pressure (see hypertension)
 - May be present in glomerulonephritis and / or acute kidney injury
- A gallop rhythm
 - May indicate heart failure
- Ascites

Differential Diagnosis / Conditions

- Renal causes of oedema
 - Nephrotic syndrome
 - Oedema / proteinuria / hypoalbuminaemia
 - Glomerulonephritis
 - Vasculitis
 - Acute kidney injury (AKI)
 - Chronic kidney disease (CKD)
- Cardiovascular causes of oedema
 - Congestive cardiac failure
 - Venous thromboembolism
 - Deep venous thrombosis
 - Embolic disease
 - Constrictive pericarditis
- Haematological causes of oedema
 - Severe anaemia in the newborn
 - Haemolysis from ABO blood type or Rh incompatibility
 - Glucose-6-phosphate dehydrogenase deficiency
- Endocrine or metabolic causes of oedema
 - Thyroid disease
 - Starvation
 - Localised (pedal) oedema in girls with Turner syndrome
- Gastrointestinal causes of oedema
 - Cirrhosis / chronic liver disease
 - Protein-losing enteritis
 - Cystic fibrosis
 - Coeliac disease

- Enteritis
- Lymphangiectasis
- Lymphatic abnormalities
- Milk protein allergy
- Inflammatory bowel disease
- Allergy
 - To medications
 - Following exposure to allergen
- Angio-oedema
 - Allergic
 - Idiopathic
 - Drug-induced
 - Hereditary

Investigations

To be undertaken by non-specialist practitioners (eg, General Practitioner (GP) Team):

- Urinalysis for proteinuria / haematuria
 - Urine protein:creatinine ratio if protein on urinalysis
 - Do not wait for the result prior to referring
- Electrolytes with urea and creatinine

To be undertaken by specialist practitioners (eg, Emergency Department / General Paediatric Team(s)) if not already done:

- Full blood count
- Electrolytes with urea and creatinine
- Mast cell tryptase if suspected anaphylactic reaction (see Anaphylaxis: assessment and referral after emergency treatment [[NICE clinical guideline 134](#)])
- Liver function tests (liver enzymes as well as serum albumin, prothrombin time, and partial thromboplastin time)
- Testing for faecal fat if intestinal malabsorption is suspected
 - α 1-antitrypsin may be helpful for diagnosing protein-losing enteropathy
- C1 esterase inhibitor
 - Low levels in angio-oedema (hereditary or acquired)
- Consider thyroid function tests
- Imaging
 - Chest X-ray
 - If respiratory symptoms
 - Renal and abdominal ultrasound examination may be appropriate.

Treatment Approach

- Specific treatment will depend on the cause of oedema.
- Nephrotic syndrome should be managed with corticosteroids under the direction of a paediatrician or paediatric nephrologist.
- Most patients with renal disease benefit from a low-sodium diet.
- Fluid restriction may help but should be used cautiously on an individual-patient basis in consultation with a paediatrician or paediatric specialist (eg, in nephrology / gastroenterology / cardiology)
- Diuretics may be needed but should be used cautiously in consultation with a paediatrician or paediatric specialist (eg, in nephrology / gastroenterology / cardiology)

When to Refer

- After a face-to-face assessment if the diagnosis is still unclear

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

- Any evidence of proteinuria

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

- Respiratory distress (arrange emergency transport)
 - May be due to pulmonary oedema / pleural effusion / ascites or as a result of airway swelling as in angioneurotic oedema
- Evidence / suspicion of cardiac failure
- Acute kidney injury / oliguria
- Acute glomerulonephritis or nephrotic syndrome
- Suspected liver disease
- Localised oedema that results from venous thrombosis or lymphatic obstruction
- Anaemia severe enough to require a transfusion
- Localised oedema that results from venous thrombosis or lymphatic obstruction

Escalate care to paediatric subspecialist (cardiologist / intensivist / nephrologist) if:

- Respiratory distress
- Evidence / suspicion of cardiac failure
- Acute kidney injury / oliguria

‘Safety Netting’ Advice

- Do not assume allergic aetiology unless other potential causes have been ruled out.

Patient / Carer Information

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

- [Nephrotic syndrome](#) (Web page), infoKID
- [Oedema](#) (Web page), the NHS website
- [Allergies](#) (Web page), the NHS website
- [Nephrotic syndrome in children](#) (Web page), the NHS website

Resources

National Clinical Guidance

[Emergency treatment of anaphylactic reactions](#), Guidelines for healthcare providers (pdf), Resuscitation Council (UK).

[Anaphylaxis: assessment and referral after emergency treatment](#) (Web page), NICE clinical guideline CG134, National Institute for Health and Care Excellence.

[Acute kidney injury: prevention, detection and management](#) (Web page), NICE clinical guideline CG169, National Institute for Health and Care Excellence.

[Venous thromboembolic diseases: diagnosis, management and thrombophilia testing](#) (Web page), NICE clinical guideline CG144, National Institute for Health and Care Excellence.

[Food allergy in under 19s: assessment and diagnosis](#) (Web page), NICE clinical guideline CG116, 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.***

Hodson EM, Willis NS, Craig JC. Corticosteroid therapy for nephrotic syndrome in children. Cochrane Database Syst Rev. 2007;(4):CD001533. [\[PubMed\]](#)

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