Odour (Unusual Urine and Body)

Definition / Supporting Information

Unusual odours may be the chief complaint, symptom, or sign or provide clues in diagnosis of many conditions. Conditions causing unusual odours range from serious and potentially life-threatening conditions such as rare congenital metabolic disorders to less serious conditions such as body odour from hormonal changes in adolescents.

Essential History

Ask about:

- When odour was first noticed
- Who notices odour
  - If never detected by others, this may indicate temporal lobe epilepsy with olfactory manifestations, a space-occupying lesion, or schizophrenia
- Characteristics and strength of odour
- Location of odour
- Improvement with bathing or cleaning
- Associated symptoms, such as vomiting, weight loss, developmental delay, or lethargy
- Diet (including odorous foods)
- Growth and puberty
- Prescribed medications
- ‘Over the counter’ medications, vitamins, or herbal supplements
- Recreational drug use or exposure
- Toxin ingestion or exposure
- Family history of odours, infectious diseases, or metabolic diseases
- Possibility of foreign body (eg, in nose, ear, anus, or vagina)
- Social history (housing, homelessness, or history of neglect)
- Impact of body odour on lifestyle

‘Red Flag’ Symptoms and Signs

Infants with metabolic disorders may present with an unusual body odour. A metabolic condition should be considered in an infant or child who appears ill, malnourished, or ketotic. Urgent referral to a paediatric specialist is required in any child in whom a metabolic disease is suspected.

Ask about:

- Vomiting

- Malaise / lethargy
- Faltering growth / weight loss
- Polyuria / polydipsia
- Seizures
- Developmental delay
- Toxin ingestion or exposure

Look for:

- Dehydration
- Hypotonia
- Dysmorphic features (see Congenital Malformations)
- Organomegaly (see hepatomegaly / splenomegaly)
- Respiratory distress / tachypnoea
- Altered mental status or coma
- Signs of precocious puberty
- Signs of neglect (see Child maltreatment: when to suspect maltreatment in under 18s [NICE clinical guideline 89, section 1.3] and Child abuse and neglect [NICE guideline NG76])

Differential Diagnosis / Conditions

Metabolic disease

- Unusual odour of urine, sweat, and other body fluids may be caused by accumulation of metabolic precursors or by-products, such as:
  - Fruity, acetone-like odour of ketoacidosis from starvation or insulin deficiency / diabetic ketoacidosis
  - Maple sugar, burnt sugar, caramel odour of maple syrup urine disease
    - Other features in its severe form include acidosis, feeding difficulty, vomiting, lethargy, seizures, and coma leading to death in the first months of life
  - Cat urine odour of 3-hydroxy-3-methylglutaryl-coenzyme A lyase deficiency
    - Other features include malaise, hypoglycaemia, hepatomegaly, transaminitis, and mild acidosis
  - Sweaty feet odour of glutaric aciduria type II
    - Other features include hypoglycaemia, hypotonia, hepatomegaly, and respiratory distress
  - Dead / rotting fish odour of trimethylaminuria
    - Also known as ‘fish odour syndrome’, which is usually asymptomatic except for the odour
- Babies in England are offered screening for six inherited metabolic diseases on the newborn blood spot

  - These conditions are phenylketonuria, medium-chain acyl-CoA dehydrogenase deficiency (MCADD), maple syrup urine disease, isovaleric acidaemia, glutaric aciduria type 1, and homocystinuria (see Inherited metabolic diseases [NHS Newborn Blood Spot Screening Programme])

Malodorous and offensive sweat (bromhidrosis)

- Offensive sweat may be caused by foods (eg, garlic, spices), drinks (eg, alcohol), or drugs.
- Apocrine bromhidrosis begins after puberty with a characteristic acrid or sweaty odour.
  - If it occurs in a younger child (under 8 years in girls or 9 years in boys), it may represent precocious puberty.
- Eccrine bromhidrosis results from bacterial interaction with moist keratin.
  - Associated with hyperhidrosis, obesity, intertrigo, and diabetes mellitus
  - Aggravated by hot weather and occurs primarily in the soles, palms, and intertriginous areas

Mouth odour

- Halitosis
  - Infrequent eating and drinking
  - Foods (eg, garlic)
  - Respiratory tract and gastrointestinal infections (eg, tonsillitis)
  - Poor oral hygiene
  - Gingivitis
- Toxic substance ingestion or inhalation (eg, alcohol, marijuana (burned rope))

Foreign body retained in an orifice

- Focal foul smell (with or without discharge) from retention of a foreign body in auditory canals, nostrils, vagina, or anus.

Urinary Tract Infection

- Urinary tract infection may present with offensive urine (see Urinary tract infection in under 16s: diagnosis and management [NICE clinical guideline 54, section 1.1])

Investigations

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

- Investigations led by suspected underlying cause
- Urine dipstick testing and culture
- Blood glucose
- Swab for bacterial culture

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

- Investigations lead by suspected underlying cause
- If metabolic condition suspected:
  - Blood glucose
  - Blood gas and anion gap
  - Ammonia
  - Amino acids
  - Urine organic acids
  - Acyl carnitine
- If diabetic ketoacidosis suspected:
  - Blood glucose
  - Blood gas
  - Ketones

Treatment Approach

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

- Advice and topical interventions for axillary apocrine bromhidrosis (sweating)
- Conditions associated with eccrine bromhidrosis or foot odour may respond to combination of:
  - Moisture control
  - Topical antibiotics
  - Antifungal agents
- If odour due to a foreign body in an orifice, remove if possible
- Other treatments are based on the underlying condition (eg, antibiotics for urinary tract infection)
- In cases of neglect:
  - Refer to local safeguarding multidisciplinary team if neglect suspected
  - Offer treatment or advice regarding hygiene concerns identified eg, nappy rash

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

- Management is dependent on suspected underlying cause but may include treatment of diabetic ketoacidosis or correction of dehydration, hypoglycaemia, and acidosis
- Removal of foreign body if possible
- Certain toxins may require specific management (see Toxbase)
- Other treatments are based on the underlying condition.

When to Refer

Refer to urgently to specialist practitioners (eg. Emergency Department / Paediatric Team(s)):

- Infants with odour with findings suggesting underlying metabolic disorder (such as lethargy, decreased feeding (see Appetite Loss), vomiting, tachypnoea (from acidosis), decreased perfusion, seizures)
- New diagnosis of diabetes mellitus
- Diabetic ketoacidosis

Escalate care to sub-specialist team(s) (eg, Paediatric Metabolic / Paediatric Surgery Team(s)) if:

- Probable inherited metabolic disease
- Surgical intervention required to remove foreign body (eg, Ear, Nose, and Throat (ENT) Team for removal of foreign body in nose or ear that non-specialist teams have been unable to remove)
- Plastic surgical intervention required for management of hyperhidrosis not responsive to topical therapies

‘Safety-Netting’ Advice

- Advise parent / carer to return if odour worsens or has not responded to measures and topical agents provided.

Patient / Carer Information

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

- Body odour (Web page), the NHS website
- How to stop smelly feet (Web page), the NHS website
- Trimethylaminuria (’fish odour syndrome’) (Web page), the NHS website
- Bad breath (halitosis) (Web page), the NHS website
- Nappies, nappy rash and nappy hygiene (Web page), the NHS website

Resources

National Clinical Guidance

Child abuse and neglect (Web page), NICE clinical guideline CG89, National Institute for Health and Care Excellence

Childmaltreatment: when to suspect maltreatment in under 18 (Web page), NICE clinical guideline CG89, National Institute for Health and Care Excellence

Diabetes (type 1 and type 2) in children and young people: diagnosis and management (Web page), NICE clinical guideline CG89, National Institute for Health and Care Excellence

Urinary tract infection in under 16s: diagnosis and management (Web page), NICE clinical guideline CG54, National Institute for Health and Care Excellence

Medical Decision Support

Neglect (Web page), RCPCH Child Protection Companion

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.

NHS Newborn Blood Spot Screening Programme (Web page), Public Health England

Toxbase (Website), National Poisons Information Service

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