

History and examination

1

While the majority of adult patients will be compliant with history and examination, it often takes skilled communication to perform these key aspects of assessment in paediatrics.

Building rapport with the child or young person, as well as their caregivers, is vital. Your approach should be age appropriate and flexible. The only way to gain these skills is by clinical experience, so make the most of your paediatric placements, taking opportunities to interact directly with babies, children and adolescents wherever possible.

When summarizing the clinical history and examination, begin to think about how you would investigate and manage the case. It is good to practise this skill as a student, as it will be expected of you once you become a foundation doctor.

PAEDIATRIC HISTORY TAKING

Introduce yourself and establish who is in the room, taking time to establish rapport. Whilst it can be tempting to take a history directly from the parent/carer, especially where a child is shy or anxious, it is much better to take your history at least partly from a child who can speak, wherever possible. This is particularly important where child protection concerns have been raised.

COMMUNICATION



It is key to establish who everybody is and not make assumptions about how people are related (it is highly embarrassing to incorrectly assume an older mother as a grandmother or a two-dad family as a father and uncle!) A helpful approach can be to ask a verbal child, 'who have you brought with you today?' and confirm precise relationships with the adult(s).

ETHICS



The initial clerking is the appropriate time to establish parental responsibility, which is absolutely vital if consent for investigations or treatment is going to be needed or where there are any child protection concerns. See Chapter 19 for more information on parental responsibility.

Presenting complaint

As with any history, begin with open questions to establish the reason for presentation. Explore the nature of any symptoms, the onset, duration and any precipitating factors. In addition, explore associated symptoms. If the child has a possible infection, find out if anyone is currently unwell at home, whether they have travelled abroad or eaten anything unusual. It is useful to establish which symptoms are most worrying to the child and/or their parents. Do not dismiss parental anxiety: a parent who tells you 'my child is not himself/herself' may have picked up on something that you have missed.

Medical history

Explore any previous diagnoses, hospital admissions and previous treatment. Many children will have no previous conditions, but some children, for example, those who were born very prematurely or with congenital syndromes, may have a list of medical history as long as many adult patients you have seen. It can be useful to read previous discharge letters or clinic correspondence, especially if the child is under the care of a specialist centre.

Inquire as to whether the child is up to date with their immunizations and if not, explore the reasoning behind this. It may be that they are open to having catch-up immunizations which can be arranged via their general practitioner.

Drug history

Take a full history of current and previous medications, including doses, frequencies, route of administration and indication, if known. It is very important to explore compliance with treatment – lack of a compliance may be a safeguarding concern. Document carefully any drug allergies including whether the child has taken that drug and the nature of the allergic reaction.

Birth history

In an older child, you only need to briefly establish any key events around birth (e.g., prematurity or congenital conditions). For neonates and infants, the birth history is key (see the 'Neonatal history' section).

Developmental history

Ask about the age at which key developmental milestones were reached including any concerns about vision or hearing. See Chapter 17 for more details.

Example (autosomal dominant inheritance)

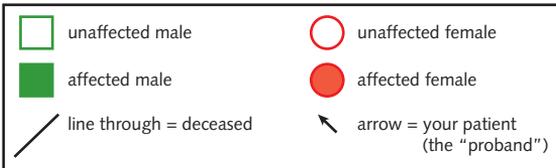
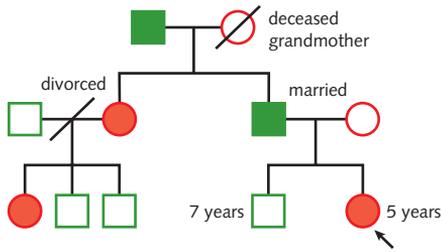


Fig. 1.1 How to draw a family tree.

Family history

Ask about medical and mental health problems within the family. In paediatrics, drawing a family tree can be very useful, both in diagnosing heritable conditions and in establishing the social history (see Fig. 1.1). Ask specifically about parental consanguinity, which can increase the likelihood of autosomal recessive conditions (e.g., metabolic conditions).

Social history

You must establish who the child lives with and any contact with parents/other caregivers who they do not live with, as well as any involvement with social care.

COMMUNICATION



Always ask about other services that are involved, in particular whether the family has any current or historic involvement with social care. You can preface the question by explaining, 'this is a routine question that we ask all paediatric patients'.

Other important things to ask about include:

- parental occupations
- any difficulty at home (e.g., divorce, recent bereavements and domestic violence)
- pets at home and exposure to other possible allergens
- parent/carer smoking, alcohol or drug use. These questions should also be asked of an adolescent patient (see the 'Adolescent history' section)

RED FLAG



Taking a thorough social history will allow you to identify children who are at risk of abuse. The 'toxic trio' are three factors identified together as high risk for child abuse:

- domestic violence
- parental mental health problems
- substance misuse

ADOLESCENT HISTORY

The key consideration when taking a history from an adolescent is to always offer to speak to the young person alone. This is important for two reasons. First, young people should be supported to take responsibility for their own health, which includes interacting with the doctor or health-care professional themselves. Second, and very importantly, there are many important things that a young person may not be comfortable in saying in front of their parents.

COMMUNICATION



A good way to speak to the adolescent alone is simply to say 'we routinely speak to all young people of your age on their own, and also with their parents/carers, are you happy for us to do that now?' and ensure you find a place somewhere for their parents to sit which is well out of earshot.

ETHICS



Confidentiality can be complex when working with adolescents, especially if they disclose a potential safeguarding risk. It is important to be up front with the young person by explaining that there may be situations where you would have to share what they have told you with another healthcare professional, and potentially their parents, but this is not common and you would always discuss it with them before doing so.

Adolescents generally appreciate honesty so be up front and acknowledge that some topics might be difficult to talk about. If you seem embarrassed, they likely will be too.

The Home, Education/Employment, Eating, Activities, Drugs, Sexuality, Suicidal ideation and Safety (HEEADSSS) framework has been developed to give a structured way of exploring different aspects of a young person's life.

- Home: find out where they live, who they live with and whether there are any difficulties at home.
- Education/Employment: find out about school/college and explore their plans/ambitions. Discuss friendship groups and any problems such as bullying.
- Eating: it is useful to explore eating habits to detect any eating disorders which commonly start in adolescence. See Chapter 18 for more information.
- Activities: find out what they do in their free time, exploring hobbies and interests. This is an opportunity to discuss social media use, including potential risks like cyberbullying, 'sexting' and meeting up with people they have spoken to online.
- Drugs: explore smoking, alcohol and drug use, and whether they have felt any peer pressure to use substances. You may want to explore how they are paying for any substances used.
- Sexuality: you may need to preface this by acknowledging that some young people find these issues embarrassing to talk about. Explore any relationships, and if they are having sex, whether they are using any forms of protection, and whether there are any issues around consent. Explore their feelings and whether they have felt pressured or unsafe during sexual activities.
- Suicide/low mood: ask about sources of stress and whether they feel down or anxious. If they do, you should specifically ask about self-harm and thoughts or plans of ending their own life. Evidence shows that asking about suicide does not make it more likely to happen.
- Safety: you may have covered this already but make sure you have established potential sources of danger at home, at school, online or in other arenas. Specific safeguarding risks include joining gangs, radicalization, child trafficking and grooming.

You will need to use your judgement: often many of these areas need to only be briefly covered. If you feel unsure or that things warrant further discussion, seek senior paediatric advice and/or help from your local child protection team.

COMMUNICATION



According to the Office for National Statistics, in 2017, 4.1% of young people identified as 'lesbian, gay or bisexual' – ask about relationships in an open way, making no assumptions about the gender of any partners.

HINTS AND TIPS



Society's understanding of gender is evolving rapidly. You should respect the identity of a transgender young person, using the name and pronouns that they are comfortable with.

Many people are coming out as nonbinary: this is any gender that is not exclusively 'man' or 'woman' – explore what this means to the young person in front of you and mirror the language they use.

NEONATAL HISTORY

When taking a neonatal history, more emphasis should be on the details of the birth. Many maternal conditions affect the newborn infant and the details of delivery and resuscitation are essential.

Antenatal events

- Establish the results of antenatal ultrasound scans as well as any invasive testing (amniocentesis or chorionic villus biopsy).
- Ask about antenatal blood tests for infection.
- Ask about any maternal illness during pregnancy such as diabetes and hypertension.
- Ask about maternal smoking, alcohol and drug use during pregnancy.

Birth

Key facts about the birth:

- gestational age at delivery
- mode of delivery
- duration of rupture of membranes
- birthweight

RED FLAG

In a neonatal history, you should ask about and clearly document any risk factors for sepsis in the newborn:

- known maternal group B *Streptococcus* (GBS) colonization or a previous baby with GBS
- prelabour rupture of membranes
- prolonged rupture of membranes (>18 hours in preterm birth)

- prematurity (gestation <37 weeks)
- maternal bacteriuria
- suspected/confirmed chorioamnionitis or maternal fever >38°C during labour or maternal treatment with intravenous antibiotics for suspected/confirmed bacterial infection in 24 hours before/after birth
- suspected/confirmed infection in another baby if multiple birth

Postnatal events

- Whether the baby needed any resuscitation.
- Any problems encountered after birth, for instance, admission to the neonatal unit, issues with feeding or jaundice.
- Whether the baby is breastfed or bottle-fed, establishing how often they are feeding and what volume.
- Whether they passed meconium within 48 hours (if not, could be suggestive of Hirschsprung disease) and urine within 12 hours (if not, could suggest a genitourinary problem, e.g., posterior urethral valves in a baby boy).

HINTS AND TIPS



It is useful to review the personal child health record (or 'Red Book') for all infants and young children with respect to immunizations, growth development.

PAEDIATRIC EXAMINATION

The key to successful paediatric examination is being flexible and opportunistic. If the child is sitting quietly on their parents lap, that is probably a good time to auscultate their heart. If they are already crying or screaming, you might be able to examine their throat. Watching a child playing on the floor in front of you will give a lot of information about their neurology. The parent/carer is often the best person to help you to examine their child.

COMMUNICATION



Play is an excellent way to help young children understand and overcome their anxiety. Asking the child to help you examine their teddy bear first is one way of doing this.

General examination

- Ideally you would measure the weight and height, and plot on a growth chart. While not feasible in objective structured clinical examinations (OSCEs), you should mention this.
- Look at the observation chart, and compare their values with the age-appropriate normal limits (Table 1.1).
- Does the child look generally unwell to you? If the child is happily playing, this tells you that they are unlikely to be seriously unwell. A child who does not interact or react much on you examining them is a worrying sign.
- Look generally at the colour of the skin, any rashes or injuries, and at the face for any unusual (dysmorphic) features indicating an underlying condition.

Respiratory system

- Count the respiratory rate. Note the different normal values with age (Table 1.1). Measure oxygen saturations.

Inspection

- Are there any clues around the bedside (e.g., inhalers or sputum pots)?
- Note any cyanosis or finger clubbing (Table 1.2).
- Inspect the chest for any chest wall deformities (pectus excavatum, pectus carinatum) or scars suggesting previous surgery.
- Look for signs of respiratory distress:
 - Nasal flaring.
 - Use of accessory muscles to breathe or head bobbing in an infant.
 - Intercostal, subcostal or sternal recession.
- During your initial inspection, listen for audible stridor (inspiratory), wheeze (expiratory) and any cough (a barking cough is suggestive of croup).

Table 1.1 Acute paediatric life support: normal values for heart rate, respiratory rate and systolic blood pressure

Age (years)	Heart rate (beats/min)	Respiratory rate (breaths/min)	Systolic blood pressure (mmHg)
<1	110–160	30–40	70–90
1–2	100–150	25–35	80–95
2–5	95–140	25–30	80–100
5–12	80–120	20–25	90–110
>12	60–100	15–20	100–120

Table 1.2 Causes of paediatric clubbing

Respiratory	Cardio-vascular	Gastrointestinal
<ul style="list-style-type: none"> • Pulmonary abscess or empyema • Tuberculosis • Cystic fibrosis/other cause of bronchiectasis 	<ul style="list-style-type: none"> • Cyanotic congenital heart disease • Infective endocarditis • Infected graft 	<ul style="list-style-type: none"> • Inflammatory bowel disease (especially Crohn disease) • Coeliac disease • Chronic liver disease

Palpation

- Feel for chest expansion and whether it is symmetrical.
- Assess for a central trachea and the apex beat.

Percussion

- Percussion is more useful in children aged over 5 years and can give additional information to auscultation alone – are there any areas of dullness or hyperresonance?

Auscultation

- Auscultate the chest over the front and back for:
 - Understanding whether air entry is equal.
 - Ratio of inspiration to expiration.
 - Any additional sounds: bronchial breathing, wheeze or crepitations (in a coryzal child, you may hear transmitted upper airway noises).

Cardiovascular system

- Measure the heart rate and blood pressure, and compare them with the normal values for age.

Inspection

- Are there any clues around the bedside (e.g., supplementary oxygen or medications)?
- Note any cyanosis, clubbing or peripheral signs of infective endocarditis (splinter haemorrhages, Osler nodes or Janeway lesions).
- Inspect the chest for scarring.

Palpation

- Feel whether the peripheries are warm and well perfused.
- The brachial pulses are used rather than the radial pulses. Palpating the femoral pulses is important as they can be absent in coarctation of the aorta.
- Palpate the apex beat: in dextrocardia it is on the right.
- Hepatomegaly is one of the signs of cardiac failure. In contrast to adults, children with cardiac failure usually do not show crepitations or sacral/peripheral oedema.

Auscultation

- Auscultate for heart sounds and added sounds and murmurs.
- See [Chapter 3](#) for the murmurs heard in specific conditions.
- Innocent murmurs are common in children and should be distinguished from pathological murmurs ([Box 1.1](#)).

Gastrointestinal system

Inspection

- Are there any clues around the bedside (e.g., vomit bowls or nasogastric feeds)?
- Note any clubbing, nail changes [leukonychia (low albumin) or koilonychia (iron deficiency)] or jaundice.
- Inspect the abdomen for distension and scarring.

Palpation

- Watch the child's face for any sign of tenderness.
- Feel for masses and organomegaly: the liver is usually palpable until puberty. In a constipated child, you may feel hard stool.
- Peristalsis: this might represent obstruction or pyloric stenosis.
- Assess for hernias.

HINTS AND TIPS



While palpating the abdomen, ask the child questions to distract them. True tenderness (e.g., from an inflamed appendix) will not be distractible.

Percussion

- Percuss for organomegaly or a distended bladder.

Auscultation

- Auscultate for bowel sounds. Absence suggests obstruction.

BOX 1.1 FEATURES OF INNOCENT HEART MURMURS

- Changes with posture
- Localized
- Asymptomatic
- Normal cardiac examination
- Systolic only
- No thrill

Nervous system

Most children will give you a lot of information in their play and the examiner must observe how the child interacts with his or her surroundings.

Observe:

- the gait as the child walks in
- posture at rest
- level of alertness or conscious level

Assess tone, reflexes, power, coordination and sensation, cranial nerves and cerebellar function as for an adult, adapting your examination to the age of the child.

HINTS AND TIPS



The plantar reflexes are predominantly extensor (down-going) in infants aged <6 months and the transition to flexor might be asymmetrical.

Ear, nose and throat

This is often done at the end because it causes the most distress to the child (Fig. 1.2). It is vital that the examiner is helped by a parent who can hold the child still. The neck

should be palpated for lymphadenopathy and then the ears should be examined. Looking at the throat should be done at the end because a wooden tongue depressor might be needed to visualize the throat.

Never examine the throat if upper airway obstruction is suspected (e.g., epiglottitis or severe croup).

THE NEONATAL EXAMINATION

All neonates should undergo a full examination within 24 hours – ‘baby check’ or newborn and infant physical exam. This allows any abnormalities to be detected early and also reassures parents of the numerous common normal variants that are found.

Begin by congratulating the new parents, and asking whether there is any family history of congenital heart or hip problems. After a general inspection, a top-to-toe approach is usually helpful but if the baby is not crying, take the opportunity to auscultate the heart and lungs.

General inspection

- Assess the baby’s colour, posture and activity. Look for any dysmorphic features
- Measure the weight, length and head circumference.



Holding a young child to examine the throat. The mother has one hand on the head and the other across the child's arms

Fig. 1.2 Throat examination. Holding a young child to examine the throat. The parent has one hand on the head and the other across the child's arms. Remember to have a throat swab with you if pus or exudate is seen to avoid having to repeat the procedure.

Skin

- Many neonates show some jaundice. This becomes pathological if the level is above the treatment line or if seen within 24 hours.
- Erythema toxicum is a benign condition affecting approximately 50% of all infants. It presents as macular lesions with a central yellow papule.
- Cyanosis can be difficult to detect and should be observed on the tongue and lips. Peripheral cyanosis without central cyanosis is not pathological (acrocyanosis).
- Pallor might represent anaemia or illness; plethora might be due to polycythaemia.
- Mongolian blue spots must be documented because they appear identical to bruising. They are commoner in Afro-Caribbean babies and usually resolve by 1 year.
- Mottling is often seen in healthy infants (termed 'cutis marmorata'), but must be distinguished from mottling in an unwell, septic infant.
- Vascular lesions such as strawberry haemangiomas and port wine stains are relatively common. They are not concerning unless there are multiple lesions or they are on the face (sturge weber is discussed in [chapter 13](#)).

HINTS AND TIPS



Note all Mongolian blue spots for future reference, as they can be mistaken for bruises. Ideally, these should also be documented in the child's health record (the red book).

Head and neck

Note the shape and size of the head and fontanelle. The sutures should be palpable and head trauma from delivery may manifest as:

- Caput succedaneum: diffuse swelling that crosses the suture lines. It resolves in several days.
- Cephalohematoma: this never crosses the suture lines and is caused by subperiosteal haemorrhage; 5% are associated with fractures.
- Subgaleal haemorrhage: rare but potentially lethal neonatal condition where there is accumulation of blood in the subaponeurotic space between the epicranial aponeurosis of the scalp and the periosteum. In term infants, this space can hold as much as 260 mL of blood and a bleed into it can therefore lead to severe hypovolemia.

Sternocleidomastoid tumours or thyroglossal cysts might be palpable as neck lumps in the midline. Palpable lymph nodes are found in 33% of all neonates.

Face

Observe for symmetry when the infant cries or yawns. Facial nerve palsy is common after forceps delivery and is self-limiting:

- Eyes: look for the red reflex (if absent, will need to exclude cataracts or neuroblastoma) and evidence of conjunctivitis. Occasionally the red reflex may be difficult to see in which case it may be useful to check the mother's red reflexes for comparison. A blue sclera is normal in babies aged <3 months.
- Ears: look at the position and for any skin tags.
- Mouth: loose natal teeth need removal. Palpate *and* look for cleft palate.

Chest

Commonly, periodic breathing can be seen, during which there are pauses lasting less than 10 seconds. This is normal and more common in preterm infants.

Auscultation for breath sounds and heart sounds should be done when the infant is quiet.

- Breath sounds: listen for presence and symmetry.
- Heart sounds: listen for the quality and intensity of the heart sounds.
- Murmurs present after 24 hours of age should be investigated with an ECHO.

The femoral pulses should be palpated and, if weak or absent, might indicate coarctation of the aorta.

Abdomen

Many infants have a small degree of abdominal distension and this is a normal finding. Observe for:

- abdominal wall defects
- scaphoid abdomen suggesting diaphragmatic hernia
- Examine for inflammation or discharge from the umbilicus. The cord typically falls off between 7 and 10 days

Genitalia and anus

Girls: the clitoris and labia are normally enlarged and vaginal bleeding might be observed. This is due to maternal oestrogen withdrawal and requires no treatment.

Boys: the testes should be palpable and phimosis is normal. The foreskin should never be retracted. Check for hypospadias and good urinary stream in case of underlying renal pathology.

For the management of ambiguous genitalia, see [Chapter 6](#).

Check for patency of anus and that meconium is seen to be exiting from the anus to exclude any suspicion of a fistula; meconium should be passed in the first 24–48 hours. A delayed passage of meconium may indicate an underlying pathology (e.g., cystic fibrosis or Hirschsprung disease).

Limbs and spine

Examine all digits and for palmar creases. Supernumerary digits (polydactyly) and abnormal fusion of the digits (syndactyly) are often familial.

The Barlow and Ortolani tests should be performed. In the Barlow test, backward pressure is applied to the head of each femur in turn, and a subluxable hip is suspected on the basis of palpable partial or complete displacement. The Ortolani test consists of forward pressure applied to each femoral head in turn, in an attempt to move a posteriorly dislocated femoral head back into the acetabulum. Palpable movement suggests that the hip is dislocated or subluxed, but reducible. Observe for leg length discrepancy and range of abduction; only gentle force is needed.

Palpate the vertebrae, looking for scoliosis. Any abnormal pigmentation, dimples or hairs over the lumbar region

should raise the suspicion of spina bifida. A sacral dimple is common and usually normal if the base is seen.

Neurology

The spontaneous movements of the infant (which should be equal in all limbs) should be observed and then examination of:

- tone: look for both hypotonia and hypertonia
- reflexes: both primitive and deep tendon reflexes

MEDICAL SAMPLE CLERKING

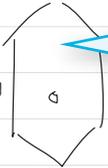
A sample medical clerking is shown in [Fig. 1.3](#). It illustrates some of the points discussed earlier in this chapter.

Hospital No. X000001		Attending Paediatric Consultant: Dr Jones
DOB 15/08/11		
Baby A		
26/09/11 21:30		
6 week old male infant, accompanied by mother		
<u>PC</u>	Vomiting	1. Presenting complaint should be brief but it is helpful to mention relevant background information
<u>HPC</u>	Gradual onset over previous five days Usually occurs in period after feed Vomit is milk only - no bile or blood staining Forceful vomiting - milk clears mother's lap Infant appears hungry and eager to feed. Breast fed Stool frequency reduced. No diarrhoea	
<u>PMH</u>	Born at St Elsewhere's Hospital Born at term, spontaneous vaginal delivery (SVD) Birth weight 3650g Mild jaundice 3-5 days No significant perinatal problems	2. Past medical history should include details of birth and any neonatal problems
<u>DH</u>	Smiles in response Fixing and following Responds to sounds	
<u>Family Hx</u>	Siblings: - Brother aged 4 years - mild Asthma - Sister aged 2 years - VSD, under review Mother aged 31 years, well Operated on for "bowel obstruction" at 4 weeks of age Father aged 33 years - Asthmatic	
<u>Social Hx</u>	Father electrician Mother a nurse (not working) Living in own flat No previous or current contact with social care. No smokers at home. No pets	
<u>Drug Hx</u>	Not on medication No known drug allergies	3. Always record the dose and frequency of any drugs - remember you'll be writing the drug chart later! Always document that you have asked about drug allergies

Fig. 1.3 Clerking.

Continued

<u>O/E</u>	General	Well infant Mild jaundice No dehydration Oral thrush
	ENT	NAD
	CVS	Heart rate 110/min Peripheral pulses present BP - 95/70 mmHg Cardiac impulse normal Heart sounds I & II normal, No murmurs
	RS	Respiratory rate 35/min No recession Breath sounds vesicular, No added sounds
	Abdomen	Not distended, No visible veins Visible peristalsis - intermittent Soft, no masses No hepatomegaly, No splenomegaly Hernial orifices - NAD PR - not done
	CNS	Alert, vigorous Anterior fontanelle - soft, slightly depressed Tone - normal and symmetrical Movements - symmetrical Reflexes - not examined



4. Record your initial observations – they are important. 'Alert and chatty' or 'Distressed and looks unwell' tell you a lot about the patient

5. You can use diagrams to clarify your examination findings

Impression ? pyloric stenosis (PS)

- Plan
1. Observe test feed
 2. Intravenous access
 3. Full blood count, Urea and Electrolytes, Liver function tests and Blood gas
 5. Nil by mouth
 6. Commence maintenance intravenous fluids
 7. Insert Naso-gastric tube on free drainage
 8. Fluid balance chart
 9. Refer to Paediatric Surgical team
 10. Abdominal ultrasound scan to confirm/refute PS

6. Always include a management plan – even when you are still a student. It might not be right but you need to start training yourself to think like a doctor

7. Sign your notes, including printed surname and bleep number

R Kapoor
Kapoor
Bleep 676
FY2 (foundation year)

Fig. 1.3, cont'd

● Chapter Summary

- You need to be flexible and opportunistic with paediatric history taking and examination, adapting your approach to the age of the child.
- Take a thorough social history, being aware of potential child protection issues.
- Always speak to adolescents on their own, as they may disclose things to you that they are not comfortable to say in front of their parents/carers.

FURTHER READING

National Institute for Health and Clinical Excellence (NICE). Neonatal infection (early onset): antibiotics for prevention and treatment (CG149). London: NICE, August 2012. Available from: <https://www.nice.org.uk/guidance/cg149>

Doukrou, M., Segal, T.Y., 2017. Fifteen-minute consultation: communicating with young people – how to use HEEADSSS, a psychosocial interview for adolescents. *Arch Dis Child Educ Pract Ed.* 103, 15–19. <https://doi.org/10.1136/archdischild-2016-311553>.