Adolescent medicine

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After reading this chapter you should be able to:

- manage transition of adolescents with chronic health needs to adult services
- assess and diagnose risk-taking behaviours including non-adherence, self-harm, alcohol and substance misuse and make appropriate referral to specialist services
- to assess, diagnose and manage eating disorders and know the risks and complications of treatment
- to assess, diagnose and manage problems relating to sexual health including contraception, sexually transmitted disease and teenage pregnancy

Know how to manage transition of adolescents with chronic health needs to adult services

Adolescent health needs

Adolescence is defined as the transition from childhood to adulthood and is characterised by typical physical, psychological and social changes that do not occur at any other time during a person's life. The onset of adolescence is heralded by the physical changes of puberty, whereas in later adolescence key psychosocial transitions signal the emergence into adulthood. The key events of adolescence are:

- completion of growth and sexual development
- development of a personal identity which is distinct from that of their carers
- formation of intimate relationships with members of their peer group
- development of autonomy and independence

The WHO defines adolescence as 10–19 years and youth defined as up to 25 years. However, it is increasingly argued that there are biological, psychological and social reasons to extend the definition of adolescence beyond 19 years of age and even up to 25 years as the neurobiological changes of adolescence continue into the third decade of life.

Adolescence is a time of great opportunity where the individual develops interests, friendships, lifestyles and belief systems that form a basis for their adult lives. It is also a time of great health vulnerability with an increased risk of death and morbidity from injury, an increased susceptibility to mental illness and poorer outcomes from any pregnancy.

Control of long-term conditions such as asthma, epilepsy, arthritis and diabetes often deteriorates during adolescence, and risks from acute infections (such as meningococcal disease), allergic disease (fatal anaphylaxis) and cancer are also increased compared to school-age children. Young people with neurodevelopmental disorders are at increased risk of health-related problems as they navigate the psychological and social transitions to adulthood. When considering young people aged 10–19 years, it is important to recognise that the patterns of mortality, morbidity and presentation of illness are very similar to those of young adults and therefore the needs of young people in relation to healthcare providers are similar to those of young adults. Increasingly, the two age groups are considered together as adolescents and young adults (AYA) in a healthcare context.

Risk-taking behaviours during adolescence contribute to mortality and morbidity during this key developmental stage. It is now understood, however, that the risk-taking behaviours which create health vulnerabilities are a key and necessary aspect of development which facilitate the transition to adulthood.

The challenge for paediatricians is to:

- understand the unique patterns of illness and injury during adolescence and their social determinants
- provide developmentally appropriate healthcare services for young people and support their transition to adulthood with an improvement rather than a deterioration in their health
- work with young people, families, other health providers and governments to ensure services and policies are

in place which promote the health needs of adolescents and young adults
- research and innovate to enhance the health of young people and improve access to developmentally appropriate healthcare through meaningful and ethical participation
- promote the health and safety of young people, respect their individual rights, reduce health inequalities and tackle the social determinants of health as this is likely to have important health and economic consequences into the future.

The use of formal interview tools can help discussions with adolescents and ensure that important areas that may impact on health are addressed. One such tool is the structured HEEADSSS method of interview developed by Drs Goldenring and Rosen that provides introductory phrases for each of the listed topics.

PRACTICE POINT – the HEEADSSS structured interview

- H - Home environment
- E - Education and Employment
- E - Eating
- A - Activities (peer related)
- D – Drugs
- S – Sexuality
- S - Suicide/depression
- S - Safety

Legal framework

As young people acquire independence during the transition to adulthood, they are permitted greater rights as citizens and this includes the right to vote, the right to work and the right to make decisions for themselves free from parental involvement. They are also granted the right to participate in a range of activities that are prohibited for children such as consensual sexual intercourse, getting married, driving motor vehicles, buying alcohol and tobacco, gambling and obtaining financial credit.

In England and Wales, the Children Act 1989 applies to all children and young people up to their 18th birthday and outlines the responsibility of the state and parents in this regard. There is, however, other UK legislation that permits young people to receive adult responsibilities at ages younger than 18yrs. For example, young people can apply for a provisional driving licence at 17yrs of age, can legally have consensual sex from 16yrs of age and are assumed to have mental capacity to make some decisions from age 16ys or earlier.

The key to understanding the legal framework is the issue of context. There is no single piece of UK legislation that defines adulthood, rather a series of different pieces of legislation that define when a young person can acquire the right to adult responsibilities. From a healthcare perspective, it is crucial that paediatricians have expertise in the legal framework of consent and confidentiality in relation to children and young people. This topic is presented in more detail in Chapter 32 on Ethics and Law.

Know how to assess and diagnose risk taking behaviours including non-adherence, self-harm, alcohol and substance misuse and make appropriate referral to specialist services

Risk-taking behaviour

Substance abuse

Substance misuse by adolescents and young adults is a major public health concern as it contributes to morbidity and mortality in adolescence. Over the lifetime of an individual, much of the morbidity and mortality attributed to alcohol, tobacco and other drugs can be traced to behaviours that begin during adolescence. Substance use is also associated with risks of abuse, poor educational and employment outcomes, criminality, disrupted peer and family relationships as well as a range of mental and physical health disorders.

Alcohol, tobacco and cannabis are the substances most often used by adolescents although trends in drug use do vary over time. There have been recent reductions in prevalence of adolescent alcohol use and smoking in the UK but with increases in the use of cannabis, novel psychoactive substances and vaping. Shifting trends in drug use are predictable and cyclical, although they are influenced by population level factors such as legislation, taxation and law enforcement activity.

The period of adolescence includes the ongoing state of brain development and is a time of risk-taking and sensation-seeking behaviours. Such behaviour would include substance use that may lead to permanent changes. The CRAFFT screen is a brief screening tool that has been validated in the adolescent primary care setting to identify problematic substance use and uses a series of six questions to explore the topic and help identify those young people who may need support.

Alcohol

Alcohol is the drug most commonly used by adolescents and is a CNS depressant that stimulates the endorphin and dopaminergic reward systems. It is rapidly absorbed and has physical, mood and cognitive effects.

Recent UK data show that although rates of alcohol use continue to rise with increasing age, the number of young people who drink and the amount that they drink appears

to be decreasing gradually over time. Similarly rates of hospitalisation of young people for alcohol-related conditions are falling.

Alcohol use increases with age and, among 15 year olds in England, 18% report drinking in the previous week. Alcohol use in young people remains a serious public health concern as alcohol contributes to preventable deaths and injury and alcohol use established in adolescence tracks into adulthood.

Alcohol use in young people has been associated with the following:

- injury—motor vehicle accidents, falls, interpersonal violence
- victim of physical/sexual assault
- sexual risk behaviours
- criminality
- self-harm and suicidality

Alcohol is neurotoxic and whilst the extent of the effects on the developing adolescent brain have not been fully elucidated, it is known that binge drinking and heavy alcohol use in adolescence has effects on brain structure and function including impaired learning, impaired memory and disruption of the sleep-wake cycle. Young people do appear to be more tolerant of the acute intoxicating effects of alcohol and show fewer acute withdrawal effects than adults.

Children of parents with an alcohol use disorder are four to ten times more likely to develop the same problem. The perceptions of parental approval of alcohol use and the parents' use of alcohol have been identified as risk factors for adolescent initiation of drinking behaviours. Early initiation of alcohol before 14 years of age is associated with an increased risk of alcohol use disorder.

Marketing and media influences have a substantial effect on alcohol use by young people. This includes alcohol industry–sponsored advertising but also the depiction of alcohol use in media and exposure to alcohol use by peers and older adults through the internet and social media.

Alcohol use disorders

The diagnostic criteria for alcohol use disorders describe a maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by two or more of the following, occurring at any time in the same 12-month period:

- alcohol often taken in larger amounts or over a longer period than was intended
- persistent desire or unsuccessful efforts to cut down or control alcohol use
- excess time is spent in obtaining alcohol, using alcohol or recovering from its effects
- craving for, or a strong desire to use alcohol
- recurrent alcohol use resulting in a failure to fulfil major role obligations
- continued alcohol use despite having social or interpersonal problems caused by alcohol
- important social, occupational or recreational activities are given up because of alcohol use
- recurrent alcohol use in situations in which it is physically hazardous

If alcohol misuse is identified as a potential problem, then a brief assessment of the duration and severity of the alcohol misuse is required. Young people under 16 years of age with alcohol use disorder should be referred to a specialist child and adolescent mental health service (CAMHS).

Tobacco and vaping

Smoking is the primary cause of preventable morbidity and mortality in the UK, accounting for one in six of all deaths. One in five young people try smoking at some point; however, regular smoking is less common and there has been recent and significant downward trend in smoking by young people.

Risk factors for smoking in adolescence include

- low socioeconomic status
- low educational attainment
- parental, sibling or peer smoking
- those with low self-esteem or depression
- lesbian, gay and bisexual young people

Nicotine is a highly addictive substance and abstinence leads to withdrawal symptoms:

- cravings
- increased appetite
- depression
- poor concentration
- irritability/aggression
- sleep disruption

All young people who smoke should be advised to stop and should be offered referral to a local smoking cessation service or given information on how to access such services. Interventions can increase the chances of smoking cessation and generally fall into two categories: medication and psychological support. The evidence suggests that smokers are four times more likely to quit successfully by using a combination of pharmacological and psychological intervention.

Nicotine replacement therapy

Nicotine replacement therapy (NRT) works by substituting the nicotine provided in cigarettes, alleviating nicotine withdrawal symptoms and allowing users to gradually reduce their dependence on nicotine. NRT includes nicotine-containing chewing gum, transdermal patches,

lozenges, mouth spray, inhalator and nasal spray and is usually taken for 8 to 12 weeks.

E-cigarettes and vaping

Electronic cigarette use (also known as vaping) is increasing amongst adolescents and young adults and there is emerging evidence that they may be effective in helping adult smokers to quit. NICE advises that young people wishing to stop smoking should be advised that whilst the safety and quality cannot be assured, e-cigarettes are likely to be less harmful than cigarettes. Recent reports of vaping-associated lung injury have added to concerns regarding their safety.

Illicit drugs

Cannabis

Marijuana is derived from the dried seeds, stems, leaves and flowering tops of the plant *Cannabis sativa* and is the most commonly used illegal substance in the UK. It may be smoked, vaped or ingested with smoking being the most common route (table 3.1).

Table 3.1 Cannabis names and methods of intake

Methods	Names	
smoked:	weed	hash or hashish
spliff or joint – rolled in a cigarette paper	pot	ganja
	dope	bud
blunt – a hollowed out cigar	grass	pollen
bowl – a pipe	skunk	bhang
bong – a water pipe	resin	sensi
ingested: (brownies/cakes)	puff	sensimiella

Onset of use typically occurs in adolescence although the peak prevalence of use is among young adults. Adolescents and young adults are more susceptible than adults to the adverse effects of marijuana use and more likely to develop cannabis use disorders.

The effects of inhalation are usually apparent within 30 minutes and typically lasts 2–3 hours, but with ingestion the effect-onset is delayed and lasts longer. The recognised effects of acute intoxication from cannabis are:

- euphoria
- distorted perception
- reduced inhibition
- anxiety
- psychotic symptoms
- cognitive impairment
- processing difficulties
- sedation
- increased appetite
- tachycardia
- orthostatic hypotension
- supine hypertension
- conjunctival injection

Short-term effects may include impairments of

- short-term memory which will affect learning and retention of information
- motor coordination—increasing the risk of injury through accidents
- judgment and risk perception—increasing the risk of injury, assault and potentially harmful or risky sexual behaviours

Repeated use of cannabis leads to tolerance, and a cannabis withdrawal syndrome has been described with symptoms of withdrawal being similar to those of nicotine withdrawal. They typically appear within one day of cessation, peak after one week, and may last up to two weeks. Withdrawal symptoms include irritability, depression, anxiety, restlessness, reduced appetite, sleep problems and weight loss.

Repeated exposure to cannabis in adolescence leads to neurotoxic effects in brain structure and function which persist into adulthood and may not be entirely reversible. This includes an association between frequent use of cannabis and a significant decline in IQ whilst heavy cannabis use has also been associated with poor educational and social outcomes. Given the importance of educational attainment to adolescent development and outcomes, the cognitive effects of cannabis are of particular concern.

Adolescent-onset cannabis use is associated with mental disorders including a risk of developing a psychotic disorder (including schizophrenia) which is increased in those with a family history. Regular use in adolescence is also associated with anxiety, depression, suicidality and deterioration in symptoms in those who already have depression, bipolar disorder or schizophrenia.

Assessment should include enquiring about cannabis use in the past year and this may be incorporated into adolescent psychosocial screening tool such as HEEADSSS. If the young person endorses use in the last year, then the CRAFFT questions can help to elicit problematic substance misuse. Cannabis use is detectable on urine toxicology testing although this is not true for synthetic cannabinoids. Emergency presentations related to cannabis are rare. For those with acute marijuana intoxication, supportive care is all that is required.

There are no specific pharmacotherapies available to treat cannabis use disorder and intervention is based on motivational enhancement and cognitive behavioural therapies, which may be delivered in individual or group settings.

Other drugs of abuse

Use of other drugs of abuse such as opioids, MDMA (ecstasy), benzodiazepines, amphetamines, LSD, ketamine and novel psychoactive substances is much less common

in adolescence, but they are all associated with significant potential harms.

Novel psychoactive substances are synthetic drugs that are designed to mimic the effects of other psychoactive substances. They can be grouped into four main categories—stimulants, cannabinoids, hallucinogens and depressants—and all can be taken in a number of ways. Toxicity is a significant concern for novel psychoactive substances and they are not "safe" alternatives.

Inhalants

Inhalants are most frequently used by younger adolescents (10–12yrs) and use decreases with age. The four groups of inhalants are volatile solvents, aerosols, nitrites and medical gases. They have a rapid onset of action, low cost and are often readily available in legal products such as spray paint, glues, cleaning fluid, permanent markers and deodorants. They are typically inhaled from a plastic bag ("bagging") or saturated cloth ("huffing").

Indicators of inhalant abuse may be subtle and it may only be suspected when potential inhalants are discovered by parents/carers. Abusers may have chemical odours on the breath or clothes, show a change in behaviour or develop a marked decrease in appetite. Young people may exhibit confusion, poor concentration, depression, irritability, hostility and paranoia and inhalation of solvents may lead to peri-nasal and peri-oral rashes and epistaxis. Social and educational decline and neglect of personal care are commonly seen. Initially they cause stimulation progressing to depression and their use often escalates as the 'high' is short lived. Inhalant abuse can lead to sudden death and for chronic users may lead to irreversible neurological, renal, cardiac or hepatic injury.

Nitrites including amyl, butyl and isobutyl nitrites are known as 'poppers'. They lead to vasodilatation, increased sexual pleasure and a mild high or 'rush'.

In recent years, abuse of 'laughing gas'—nitrous oxide—has increased as the drug is sold in balloons or canisters and is inhaled for a rapid onset. Inhalants are not detected by routine urine drug screenings.

Self-harm

Self-harm is defined as self-poisoning or self-injury irrespective of the apparent purpose of the act and includes any form of behaviour that leads to self-injury. National guidance avoids the use of the term 'deliberate' and other descriptions that imply the presence or absence of suicidal intent such as 'attempted suicide', 'parasuicide', 'non-suicidal self-injury'.

Community-based studies estimate around 10% of young people reported self-harm whilst other UK and European studies have suggested rates between 15% to 22%. Young females report two to four times higher rates of self-harm than young males and there has been a trend of increasing hospitalisations in young people for self-harm (Figure 3.1). Most young people who do self-harm do not attend hospital and many do not seek or access medical or psychological treatment. Suicide is a leading cause of death in young people and the risk is greater for boys than girls.

Young people may not be able to explain why they self-harm and this is not surprising when self-harm itself is a way of communicating, coping or adapting to intense emotional or psychological distress. The act of self-harm may serve a number of purposes in relation to the intense distress including distracting, self-punishing, communicating, controlling and distracting.

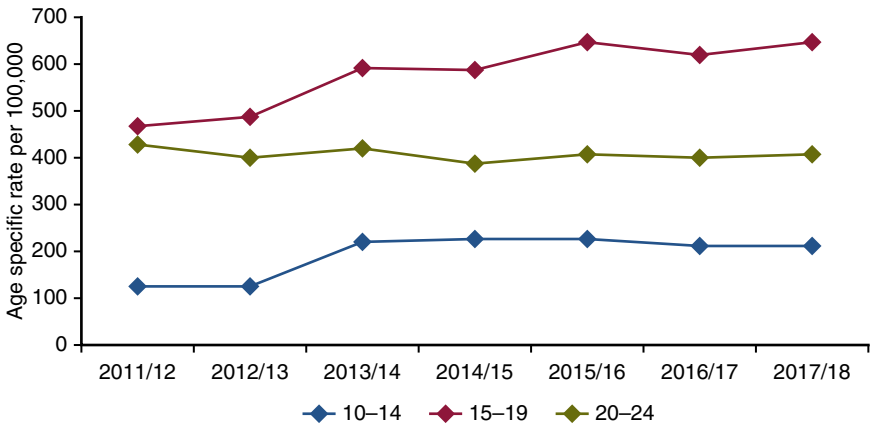

Fig. 3.1 Hospitalisation for self-harm rates among 10–24 year olds in England (Source: Public Health England Hospital Episode Statistics 2017/18. Permission to use via Open Government Licence.)

Risk factors for self-harm

- female gender
- affective or depressive symptoms
- onset of sexual activity
- sexual and gender identity
- adverse childhood experiences such as abuse, bullying, parental separation or death
- mental health disorders
- drug and alcohol use

The focus of paediatric management is:

- emergency assessment of the method, extent, timing and context of the self-harm
- emergency management of the injury or poisoning
- initial assessment of psychosocial risks and resilience and risk of abuse or neglect
- establishing whether the young person is fit for a comprehensive psychosocial assessment and any issues relating to legal framework such as consent and confidentiality
- ensuring a comprehensive psychosocial assessment of risk and need is undertaken and the results shared appropriately between professionals, young person and parents/carers
- a care plan is established with the young person to promote their safety and well-being and reduced the risk of death or serious harm

Working with young people who self-harm can induce a range of negative emotions (including anger, frustration and sadness), and paediatricians and other health professionals need to be aware of the potential for this and to understand how it may influence a professional response.

Assessment of risk

Certain aspects of the history may indicate an increased risk of later completed suicide or repetition of the attempt. These include:

- specific plan for suicide or suicidal intent
- final acts—writing a note
- no regret or a regret that attempt has failed
- potentially fatal method of self-harm
- known mental illness—depression
- repeated attempts with escalation of frequency or risk
- lack of engagement with professional response
- suicide attempts in a first-degree relative or completed suicide in any relative
- friend who has died by suicide
- making a suicide pact with another

The young person should be referred to a specialist child and adolescent mental health service that can offer an urgent comprehensive psychosocial assessment of both risk and need. If there are safeguarding concerns, a referral should be made to child protection services. The assessment of risk should include the risk of a future completed suicide and the risk of repetition as well as to document any other risks to the young person.

In addition to identifying the current resources, coping abilities and protective factors of the young person and family the assessment should also consider the needs of the young person and family in relation to safeguarding risks, mental health issues, drug or alcohol use and financial needs. It is important that paediatric and CAMHS services collaborate closely with colleagues in social care and health professionals with safeguarding expertise.

Safety planning

Parents and carers should be advised regarding safe storage of medicines and removal of sharps and provided with contacts for local and national crisis support services.

Outcomes

Suicide is uncommon before 15 years of age but increases in prevalence with age, and it is clear that rates of death from suicide are increasing in young people. The strongest predictors of suicide in young people are self-harm, cannabis and other drug use, exposure to self-harm in others and personality type. Specific groups who are at increased risk are:

- children looked after
- bereaved young people (especially those bereaved by suicide)
- LGBT+ young people
- university and college students

Know how to assess, diagnose and manage eating disorders and know the risks and complications of treatment

Eating disorders

Eating disorders are psychological disorders characterised by a preoccupation with weight and shape leading to unhealthy eating behaviours. They are relatively common and cause significant physical and psychosocial morbidity. The causes of eating disorders are complex and are likely to be multifactorial but include:

- biological—possibly genetic
- psychological—low self-esteem
- cultural—peer pressure to be a particular weight or shape

They can be categorised as:

- restrictive eating disorders—anorexia nervosa
- binge-purge type eating behaviours—bulimia nervosa

Anorexia nervosa

Diagnosed in a patient by identifying:

- restriction of energy intake
- fear of gaining weight
- disturbance of body image

Q. Picture of a 14 years old boy, with progressive weight loss & poor appetite over the last 6 months, height of 9th centile, very active in school activities and sports. He has good school performance, and otherwise normal. FBC, Electrolytes are normal. Normal bowel habits.

- DM
- Anorexia nervosa
- Hypothyroid
- celiac

Ans- b

All three features must be present to make the diagnosis, but the presence of two would lead to a diagnosis of atypical anorexia nervosa.

The young person with anorexia nervosa will restrict their energy intake relative to requirements which leads to a significantly low body weight in the context of age, sex, development and physical health.

They demonstrate a fear of gaining weight or becoming fat or display persistent behaviour that interferes with weight gain, even though they are underweight. They are often worried that if they eat normally they will become fat, so they often start altering their diet by avoiding fatty foods and carbohydrates with the aim of losing weight. They may also change behaviours to achieve weight loss such as excessive exercise, self-induced vomiting and laxative abuse.

They also display a disturbance of body image, with undue influence of body weight or shape on self-evaluation or denial of the seriousness of the current low body weight. Young people with anorexia nervosa will often see themselves as being overweight despite being a healthy weight or underweight. They see themselves as being good or bad depending on how much they have eaten and how much they weigh and may also feel that others are judging them in the same way.

Bulimia nervosa

People with bulimia nervosa can appear perfectly healthy. Usually, they maintain a normal body weight but are very worried about what people think of them and are preoccupied with dieting and losing weight.

Bulimia can be a way of dealing with difficult feelings. When a person with bulimia feels sad, angry, unloved or depressed, they may binge on large quantities of food. They often feel ashamed after a binge and try to counteract it by making themselves sick, taking large amounts of laxatives or starving for a few days.

Clinical presentation

Young people with an eating disorder may present in a variety of ways. Their difficulties often come to light after family or friends raise concerns or they present with physical manifestations of the eating disorder (table 3.2). The physical manifestations of anorexia nervosa result from weight loss and malnutrition. With starvation, there is:

- loss of tissue mass from internal organs (brain, heart)
- metabolic rate slows down
- hormonal systems are suppressed

Whilst people with bulimia are often not underweight, physical manifestations are related to the mode and degree of purging.

The initial assessment includes:

- assessment of the degree of malnutrition—height, weight, BMI centile, rate of weight loss
- identification of abnormal cognitions around food and weight
- evaluation of the potential medical complications
- psychosocial assessment (HEEADSSS)
- identification of associated conditions such as depression or obsessive-compulsive disorders
- assessment for other medical conditions which may account for the weight loss

Investigations

When a young person presents with a suspected eating disorder, initial investigations should be focused on:

- excluding other causes for weight loss
- seeking evidence of malnutrition
- seeking acute medical complications—bone marrow suppression, renal and liver impairment, electrolyte abnormalities.

Initial investigations should include a full blood count, inflammatory markers, thyroid function, coeliac serology, renal function, liver function, bone profile and magnesium.

Treatment and management

Treatment of eating disorders is best managed in the community by a multidisciplinary team including psychiatrists, psychologists, dieticians, and medical and nursing staff, and the initial treatment will be aimed at weight restoration and nutritional stabilisation. Psychological therapies include:

- family therapy (preferred treatment anorexia nervosa)
- cognitive behavioural therapy (preferred for bulimia nervosa)

Paediatricians also have a role for those young people who are medically unstable and for assessment and management of complications of chronic illness such as growth, pubertal development and bone health.

Acute admissions should be reserved for those who are severely malnourished, medically unstable, have acute complications from being underweight or have acute food refusal. The aim of an acute admission is to achieve medical stabilisation and begin weight restoration and the Junior MARSIPAN Tool (Royal College of Psychiatrists) can be used to assess the level of risk for a young person with an eating disorder. Weight restoration should be achieved by the oral route where possible but if nasogastric feeding is needed then consideration needs to be given as to whether the young person has the capacity to consent to such an intervention. Nasogastric feeding can be implemented for those who do not consent, depending on their age, under

Table 3.2 **Physical manifestations of eating disorders**

	Anorexia nervosa	Bulimia nervosa
metabolic	fatigue bradycardia, hypothermia, poor peripheral perfusion	fatigue
cardiovascular	postural changes in heart rate and blood pressure leading to dizziness and syncope reduced myocardial contractility, arrythmias, heart failure and prolonged QTc	postural changes in heart rate and blood pressure leading to dizziness and syncope arrythmias and cardiomyopathy
respiratory		aspiration pneumonia
gastrointestinal	delayed gastric emptying leading to early satiety, pain and bloating constipation raised liver transaminases	tooth decay parotid swelling, oesophagitis, Mallory-Weiss tears, oesophageal rupture acute pancreatitis ileus secondary to laxative use
renal	dehydration elevated creatinine	dehydration elevated creatinine
neurological	poor concentration and recall	seizures
endocrine	sick euthyroid syndrome suppression of the hypothalamic-gonadal axis leading to delayed or arrested puberty primary or secondary amenorrhoea faltering growth	oligomenorrhoea
musculoskeletal	weakness muscle wasting low bone mineral density and increased fracture risk	muscle weakness and cramps
haematological	anaemia, leucopenia, neutropenia, thrombocytopenia	
dermatological	lanugo hair, dry skin, hair loss	calluses on the dorsum of the hand (secondary to induced vomiting)

the Children Act 1989 with parental consent (best interests) or by use of the Mental Health Act.

Food and nutrition are the treatments for all of the manifestations associated with being underweight and medications are not used routinely to treat eating disorders. Occasionally anxiolytics will be prescribed for a young person with an eating disorder with the aim of decreasing the eating disorder cognitions, and the prescribing is usually led by CAMHS.

Potential complications

Young people who have been starved and had restricted intake for a period of time are at risk of refeeding syndrome which is a serious and potentially fatal complication. During starvation, the body is energy depleted and once glycogen stores have been consumed, the body starts to break down fats, protein and muscle as an alternative energy source. With refeeding, the body changes from a catabolic to an anabolic state and carbohydrates become the primary energy source again. The subsequent insulin secretion leads to a rapid shift of electrolytes from extracellular to intracellular compartments. Phosphate is needed for glucose metabolism, and the increased use of phosphate combined with total body depletion leads to extracellular hypophosphataemia (the hallmark of biochemical refeeding syndrome). Low phosphate levels impact on metabolic processes and can affect all systems, leading to clinical refeeding syndrome. Potassium moves into cells to give hypokalaemia. Clinical features of the syndrome include:

- delirium with visual and auditory hallucinations
- dyspnoea
- paraesthesia
- generalized weakness and fatigue
- peripheral oedema
- seizures
- coma

Clinical refeeding syndrome can be prevented by:

- correction of hypophosphataemia
- gradual introduction of nutrition
- monitoring of electrolytes—phosphate, sodium, potassium, magnesium and calcium
- monitoring of ECG (evidence of prolonged QTc)

Important sequelae

Being chronically underweight can lead to suppression of the hypothalamic-gonadal axis, and the reduction in gonadal hormones leads to delayed or arrested puberty. Low oestrogen levels, along with other hormones, leads to decreased bone mineral deposition and increased resorption; this can affect both linear growth of the bones (implications for height) and final bone density (leading to brittle bones and increased fracture risk). Restoring a healthy weight is the primary treatment for both of these sequelae.

To be able to assess, diagnose and manage problems relating to sexual health including contraception, sexually transmitted disease and teenage pregnancy

Sexual health

For a young person to enjoy good sexual health, they need to avoid unplanned pregnancy and sexually transmitted infections (STIs). A positive approach to relationships and sex requires self-esteem, an understanding of themselves and the ability to make informed choices. To make informed choices, they need to:

- understand the risks associated with different sexual practices
- have the communication skills to be able to negotiate and engage in safer sex (such as the ability to say no to sex without condoms)
- have access to contraceptive advice and the skills needed to be able to use this effectively (knowing how to use a condom)

It is important to utilise opportunities when young people present to health care settings to assess risk-taking behaviours in sexual health and give advice and health promotion on safe sexual practices. Discussions should focus around behaviour change and provision of information about local services.

In order to be effective, sexual health services need to be accessible, convenient and confidential. They should provide:

- testing for STI and pregnancy
- contraceptive advice and provision
- contact tracing and partner notification
- vaccinations

It is important that services are able to offer confidentiality and to consider the possibility of child sexual abuse or exploitation.

PRACTICE POINT - teenagers and sex: some facts

- the average age of first sex in the UK is 16 years for both males and females
- 31% of boys and 29% of girls have sex before they are 16 years old
- 6.9% of young people aged between 16–24 report being pressured into sex
- average age when child sexual abuse (CSE) is first identified is suggested to be 12–15 years
- the rates of teenage pregnancy are falling in the UK
- the proportion of conceptions in young people under 18 years that result in termination is just over 50%
- in England, sexually transmitted infections are highest in 15–24 year olds for both sexes

Teenage pregnancy

Risk factors

Rates of teenage pregnancy are higher in certain vulnerable groups:

- young people in care
- those living in a deprived neighbourhood
- those who have poor school attendance and poor educational attainment
- those with learning difficulties
- those with poor mental health
- those involved in crime
- those with history of sexual abuse

There is an association between alcohol consumption and the likelihood of high-risk sexual behaviours such as unprotected sex. In addition, adolescents are at a higher risk of becoming young parents if their fathers were from the lowest two socioeconomic groups or their mother was pregnant at a teenager.

Consequences of teenage parenthood

Teenage parents are at a higher risk of obstetric complications and maternal mortality. They are more likely to have insufficient social support, experience relationship breakdown, live with relative poverty and face the stigma associated with being a teenage parent. There is a higher risk of postnatal depression and poor mental health and many end up being 'not in education, employment or training (NEET)'.

Health outcomes of child born to young parents

Infants born to teenage parents have a 40% risk of higher mortality and a higher risk of being born prematurely or

small for gestational age. They are less likely to be breast fed and are at an increased risk of poor nutrition. They are twice as likely to be hospitalised due to accidental injuries up to the age of 5 years and are in the highest risk group for behavioural problems.

Reducing teenage pregnancy

It is important that young people receive high quality education about sex and relationships in primary and secondary school and out of school settings. This should focus on providing knowledge and skills such as delaying age of first sex, the risks of unprotected sex and effective contraception and condom use. Parents also need to be provided with information and skills to be able to talk to their children about sex and relationships. Health practitioners working with young people require training on sexual health and relationships.

Paediatricians should be able to provide information to young people on their contraceptive choices and to consider their specific contraceptive and sexual health needs. In particular, paediatricians should know how to facilitate access to contraceptive and sexual health services including timely access to emergency contraception and management of unplanned pregnancy.

Young people need easy access to confidential, youth-friendly, sexual health services. NICE guidance recommends targeted prevention for more vulnerable groups as well as coordinated support for young parents, including contraceptive advice.

Sexually transmitted infection

- helping all young people to protect themselves is a major public health issue
- in England, sexually transmitted infections in heterosexuals are highest in 15–24 year olds (Figure 3.2)
- those under 25 years accounted for 63% of all new chlamydia cases in 2016
- chlamydia is the most frequent STI diagnosis, followed by genital warts and gonorrhoea
- the introduction of the HPV vaccinations in adolescent girls may potentially have had an impact on recent trends in new diagnoses of genital warts. This is now being offered to adolescent boys as well
- in 2017, there was a reduction of 40% of new HIV diagnoses among those aged 15–24 years

Reinfection with acute STIs is a particular problem with young people, but the risk decreases with increasing age.

Chlamydia causes an infection that is often symptomless but may be associated with vaginal bleeding, discharge, abdominal pain, fever and inflammation of the cervix in women and watery discharge from the penis in men. Long-term complications may be severe, particularly

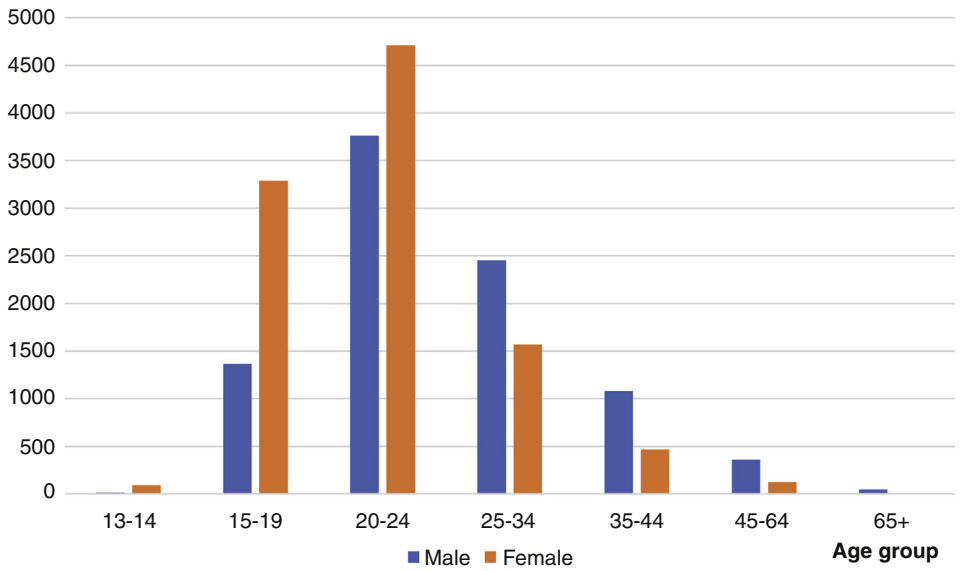

Fig. 3.2 Rates (per 100,000) of new STI diagnoses by age group and gender in England 2019 (Source: Public Health England annual report. Permission to use via Open Government Licence.)

Q. 16 yrs old, sexually active for 2 years, presented with dysuria, vaginal discharge, temp- mildly High 37.5, Supra pubic tenderness on examination, postcoital bleeding for the first time, diagnosis:

- Candida
- Chlamydia
- UTI
- TSS

Ans- b

in women, as it can lead to pelvic inflammatory diseases, ectopic pregnancy and infertility.

Gonorrhoea has an incubation period of only a few days, and males and females may experience a urethral discharge. Women are at risk of long-term serious complications such as infertility and ectopic pregnancy and it is possible to have long-term infection without obvious symptoms.

Syphilis has an incubation period ranging from a few days to 3 months. Symptoms are nonspecific, though illness usually begins with painless, highly infectious sores anywhere around the body but usually at the site of infection.

Genital warts are caused by the human papillomavirus (HPV) and are found around the penis, anus and vagina. Certain types of HPV are associated with cervical cancer and head and neck cancers. Warts often disappear without treatment but can also be removed by freezing, burning and laser treatment.

Genital herpes is a common infection caused by *Herpes simplex virus type 2 or 1*. Symptoms include small blisters in the genital area, which break down to give painful ulcers. Herpes may cause pain on urination.

Acne

Acne vulgaris is a common problem in adolescence and is a multifactorial inflammatory disease affecting the pilosebaceous follicles of the skin.

Increasing androgen production associated with puberty stimulates sebum production, and this can block the pores and result in inflammation of the surrounding skin. The spots are caused by *Propionibacterium acnes*, a common bacterium on the skin that colonises sebaceous areas. This bacteria feeds on sebum and produces waste products and fatty acids that irritate the sebaceous glands and make them inflamed.

The clinical features include

- seborrhoea—increased grease production
- noninflammatory comedomes—open (blackheads) and closed (whiteheads)
- inflammatory lesions (papules, pustules and cysts)

Acne can be painful, itchy and sore and can lead to irreversible scarring if not treated appropriately. In addition to the physical morbidity, it can also have a significant impact on the psychological well-being of a young person, leading to poor self-esteem, depression and anxiety. It can lead to young people avoiding meeting up with friends and leave them relatively isolated.

Factors which can exacerbate acne include:

- stress or emotional tension
- picking at spots
- hormones—exogenous: progesterone-only pill; endogenous: polycystic ovarian syndrome
- menstruation
- drugs—steroids, anticonvulsants, ciclosporin
- greasy emollients

Clinical assessment should address the distribution of acne, type and severity of lesions and the impact on well-being and quality of life. Young people will often underestimate the impact that the condition has and may not volunteer this information. It is good practice to use the HEEADSSS assessment to open up conversations on this issue.

Management

There is no proven evidence to suggest that hygiene, diet or sweating cause acne.

- lifestyle advice:
  - wash face twice daily with a mild cleanser
  - avoid squeezing or picking at spots as this may cause scarring
  - oil-free moisturisers are advised
- medications

Treatment of acne varies depending on the severity and the lesion type.

Those with mild acne are treated with topical treatments such as benzoyl peroxide, topical retinoids and topical antibiotic.

The management of moderate acne requires the addition of oral tetracycline or a macrolide. For young females the combined oral contraceptive pill is another alternative if there are no contraindications.

Topical treatment needs to be applied to the acne-prone areas and not just individual spots and should be continued for at least 6 weeks to see benefit. If a response is seen, the treatment should be continued for at least 6 months.

For those with severe, scarring or resistant acne, treatment with oral isotretinoin is usual. In the UK this treatment should only be delivered by a specialist dermatology service with expertise in monitoring therapy with oral retinoids. Young people usually receive treatment for around 6–8 months, and the treatment requires monitoring of mood, blood count, liver function and serum lipids. The major safety concerns are the potential effect on mood and teratogenicity. Young people with the potential for pregnancy need careful discussion regarding the need for effective contraception. A referral to a dermatology service should be undertaken if the acne is extensive, nodulocystic, scarring or shows no improvement to the initial treatment

CLINICAL SCENARIO

A 15-year-old female who was known to have epilepsy and dyslexia presents to clinic for a routine review. She reports that her seizures have been well controlled but she is feeling fed up and tearful. Her acne is becoming worse and she is embarrassed to go out with her friends. Her mother is concerned about her daughter's appetite and feels that she may have lost weight. The family are also concerned about a change in her mood and increased anxiety about school. Her periods started when she was 12 years of age and she had established a regular pattern but has now not had a period for 2 months.

On examination, she looked thin and had lost 2 kgs since her appointment 3 months previously. She was dressed in a baggy long-sleeved hoody despite it being a warm day. Her blood pressure was 94/55 and her heart rate was 46 bpm. She had cold hands with a capillary refill of 3 seconds peripherally, a low volume pulse and a scaphoid abdomen. She made little eye contact throughout the consultation and had a flat affect. Her BMI was 14.6 which was below the 0.4 centile for her age.

A differential would include an eating disorder, depression, potential side effects of medication and possible underlying medical illnesses such as inflammatory bowel disease, coeliac disease or thyroid abnormalities.

The issues that need consideration are multiple and interrelated. Initially it is important to establish a healthcare appropriate for her maturity and development including the need for an independent consultation and reassurance about confidentiality. A formal HEEADSSS assessment would be important along with obtaining details about her mental health, nutritional intake and attitudes to food which would all allow a comprehensive approach to be developed. Active treatment of her acne would also all help her to regain her self-confidence.

Early investigations were undertaken and excluded some of the listed medical conditions. It became clear that she had developed thoughts and behaviours typical of anorexia nervosa and was significantly restricting her calorie intake.

She was admitted for acute management of her condition by the multidisciplinary team and a comprehensive care plan was developed in collaboration with the patient and her parents. This included ensuring that all the issues identified were addressed.

It was recognised that her problems were likely to require longer term support and therefore planning for transition to adult services would need to be considered.

IMPORTANT CLINICAL POINTS

Illicit drugs

- use of illicit drugs should be considered in young people presenting with abnormal or erratic behaviour
- novel psychoactive substance use may be undetectable on routine urinary drug screening

Anorexia nervosa

- restriction of energy intake, fear of gaining weight and disturbance of body image are cardinal features of anorexia nervosa
- refeeding syndrome is a serious and potentially fatal complication
- hypophosphataemia is the hallmark of biochemical refeeding syndrome and monitoring and correction is vital
- consent for treatment can use the Children Act 1989 (best interests) or the Mental Health Act

Further reading

Eating disorders: recognition and treatment NICE guideline [NG69]. Published: May 2017. Updated: December 2020. https://www.nice.org.uk/guidance/ng69/chapter/Recommendations

Junior MARSIPAN: Management of Really Sick Patients under 18 with Anorexia Nervosa Royal College of Psychiatrists. London. https://www.rcpsych.ac.uk/docs/default-source/improving-care/better-mh-policy/college-reports/college-report-cr168.pdf

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HEEADSSS 3.0: The psychosocial interview for adolescents updated for a new century fuelled by media https://www.contemporarypediatrics.com/view/heeadsss-30-psychosocial-interview-adolescents-updated-new-century-fueled-media

Suicide and suicide attempts in adolescents. Benjamin Shain and Committee on adolescence Pediatrics. 2016; 138(1) https://pediatrics.aappublications.org/content/138/1/e20161420