

Answers

A1: Working within the health and science sector

Assessment practice

- 1 The Equality Act 2010.
- 2 Terms (of employment).
- 3 Where the employer or employers negotiate agreements with trade unions or staff associations which represent a group of employees.
- 4 No. In the case of 'gross misconduct', such as stealing from your employer, you can be dismissed without notice.
- 5 Any two from:
 - ▶ to comply with legislation
 - ▶ to ensure fair and equitable treatment
 - ▶ to prevent prejudice and discrimination
 - ▶ to promote social inclusion
 - ▶ to tackle the cycle of disadvantage
 - ▶ to promote respecting, celebrating and valuing of individuals.
- 6 Ensuring individuals are protected from harm, such as a vulnerable child or adult being abused by a carer or relative.
- 7 Any two from:
 - ▶ ensuring consistency
 - ▶ maintaining health and safety
 - ▶ monitoring processes and procedures
 - ▶ facilitating continuous improvement
 - ▶ facilitating objective, independent review.
- 8 In this situation, beneficence means that the government had to consider the different options for creating capacity in hospitals so that seriously ill COVID-19 patients could be treated (beneficence). They also had to consider whether the course of action would cause harm to patients being transferred to care homes or to other residents in those care homes (nonmaleficence). Patients being transferred might not have had any choice (autonomy) and might not have been aware of the risks to them or to other care home residents and staff (informed consent). Care home management may not have been told if returning patients were infected, for reasons of patient confidentiality. However, this should have been overridden by the need for truthfulness and justice (the fair treatment of residents in care homes who contracted COVID-19 and died as a result of this action). In

conclusion, this was a difficult situation at a time when less was known about COVID-19. However, mistakes were made and many people died as a result.

A2: The healthcare sector

Test yourself

A2.1

- 1 The National Health Service is provided by the state (government). It provides:
 - ▶ healthcare, free at the point of use, throughout the UK
 - ▶ prevention of ill-health
 - ▶ the promotion of healthy living lifestyles.
- 2 Any three from:
 - ▶ private residential care homes
 - ▶ BUPA
 - ▶ Nuffield Health Hospitals
 - ▶ non-NHS dentists/cosmetic dentistry
 - ▶ opticians.
- 3 A non-profit organisation is a business whose aim is not to make money for directors, owners or shareholders but rather its purpose is to provide help and support for individuals in need. Examples include Mind, Childline, British Heart Foundation, Dementia UK, Macmillan Cancer Support, Marie Curie, Diabetes UK, Barnardo's, Shelter, Age UK.
- 4 Any three from:
 - ▶ people's own homes
 - ▶ community clinics
 - ▶ community centres
 - ▶ schools
 - ▶ hospitals
 - ▶ local authority departments
 - ▶ GP surgeries
 - ▶ nursing homes.
- 5 Prison, custody suite.

A2.2

- 1 Primary care is where an individual has made, themselves, a first contact with a medical practitioner.
- 2 Any four from:
 - ▶ GP surgery
 - ▶ dentist
 - ▶ optician
 - ▶ walk-in centres
 - ▶ A&E (accident and emergency department)

- ▶ NHS 111 telephone service
 - ▶ community health services such as health visitors and school nurses.
- 3 People who need, use and care about healthcare services are encouraged to get involved in providing feedback on local area services. For example, all GP practices must have a PPG (patient participation group) made up of patients from their practice. These groups meet regularly with staff and talk about how to improve services and promote health for people who use the practice.
- 4 ▶ Healthcare services which individuals are referred to, usually by their GP.
- ▶ Planned care treating a specific illness, condition or injury, such as carrying out an operation, for example, a hip replacement or removal of tonsils.
 - ▶ Specialised care, for example, at a clinic that specialises in the illness or condition. This could be, for example, a series of appointments with a physiotherapist to help with a sports injury.
- 5 Any three from:
- ▶ often long-term care
 - ▶ highly specialised care
 - ▶ can be used as respite (short breaks) for families
 - ▶ end of life care (palliative care).

A2.3

- 1 Any four from:
- ▶ pre-existing health conditions, such as diabetes
 - ▶ physical disabilities, such as multiple sclerosis
 - ▶ mental health conditions, such as anxiety, depression, panic disorder, OCD
 - ▶ learning difficulties
 - ▶ different ages – infancy, childhood, adulthood, senior years
 - ▶ social care needs.
- 2 ▶ Socioeconomic: live in a deprived area, unemployed/low income; can't afford cost of some services, e.g. dentist; cost of public transport to get there/expensive parking; don't want to/can't afford to take time off work; unaware of services/poor education; unfamiliar with/don't understand medical terminology/jargon.
- ▶ Psychological: fear of diagnosis; embarrassed about their problem; may feel there is stigma in using the service; scared, e.g. of dentists.
 - ▶ Physical: lack of access – no ramps, lifts or disabled parking/toilets; service not available at convenient times, e.g. after work or early morning; sensory impairments not catered for: information not available in Braille or large print, staff not trained in BSL.
 - ▶ Cultural and language: staff only speaking English; information only available in English; service ethnocentric, practitioners not aware of cultural differences; no female staff; some treatments not acceptable to some cultures.

- ▶ Geographical: no local services; lack of transport to get there – not on a bus route; waiting lists – may be a long wait for services in some areas.

- 3 Any two from:

Personal factor	Examples of how it affects the services required
Pre-existing health conditions, such as diabetes	Diabetes management: Blood tests at the GP surgery every 3 months to monitor glucose levels Checks of any wounds as they may heal slowly and cause ulcers Regular eye checks as vision can be affected by diabetes
Physical disabilities, such as multiple sclerosis	Ongoing support with managing specific symptoms: Each may require different types of care and support Help with mobility, such as needing walking aids Need for physiotherapy
Mental health conditions, such as anxiety, depression, panic disorder, OCD (obsessive compulsive disorder)	Psychological therapies, such as Cognitive behaviour therapies (CBT) Prescribing medication
Learning difficulties	Annual health checks: People with a learning disability sometimes have poor physical and mental health Health issues may not be recognised or conditions not noticed The NHS encourages individuals aged 14 and over who are on their GP's learning disability register to have an annual health check
Different ages – infancy, childhood, adulthood, senior years	Common children's illnesses Childhood vaccinations Ageing process Personal factors at different life stages Illnesses and ageing affect the types of services required. See section A8.4 for detailed information about support and services required at different ages in the lifespan
Social care needs	Support with activities of daily living and maintaining independence

A2.4

- 1 They promote healthier choices by offering information and advice. They support independent management of conditions.
- 2 They support the work of health professionals with ongoing monitoring of conditions. They support health teams to manage appointments more efficiently.
- 3 Any four from:
 - ▶ Order repeat prescriptions – see your available medicines, request a new repeat prescription and choose a pharmacy for your prescriptions to be sent to.
 - ▶ Book appointments – search for, book and cancel appointments at your GP surgery. See details of your upcoming and past appointments.
 - ▶ Get health advice – search trusted NHS information and advice on hundreds of conditions and treatments. You can also answer questions to get instant advice and medical help near you.
 - ▶ View your health record – securely access your GP health record to see information such as your allergies and your current and past medicines. If your GP surgery has given you access to your detailed medical record, you can also see information including test results and details of your consultations.
 - ▶ Register to be an organ donor – choose to donate some or all of your organs and check your registered decision.
 - ▶ Find out how the NHS uses your data – choose whether data from your health records is shared for research and planning.
- 4 Surgery preparation assisted by the use of 3D printed models; custom-made prosthetics; 3D printing of surgical instruments; bioprinting tissues and organs.
- 5 Benefits include:
 - ▶ a smaller incision
 - ▶ less damage to healthy tissue
 - ▶ less pain
 - ▶ shorter hospital stay
 - ▶ less visible scars
 - ▶ faster recovery and return to normal activities.

The above points may be interrelated, e.g. less damage to healthy tissue will result in quicker healing.

A2.5

- 1 ▶ Everyone in the UK should be entitled to use the NHS.
 - ▶ Healthcare should be provided free of charge at point of use.
 - ▶ Healthcare should be based on need rather than on the ability to pay for it.
- 2 1952.
- 3 ▶ The basic personal care that nurses used to provide is now more likely to be provided by healthcare assistants.
 - ▶ Nursing is now a degree-level profession and they are involved in providing more complex care that historically was provided by doctors.
- 4 Any three from:
 - ▶ providing more care in the community
 - ▶ promoting overall wellbeing
 - ▶ preventing, rather than treating, illness
 - ▶ creating strategies to challenge health inequalities and deprivation in society
 - ▶ increasing multi-agency working to support individuals.
- 5 Any two from:
 - ▶ Funded through private medical insurance or individual payments for treatment or care.
 - ▶ This sector continues to expand – sometimes to avoid NHS waiting times.
 - ▶ Sometimes the NHS will buy in private treatment in order to shorten waiting lists.

A2.7

- 1 Any four from:
 - ▶ confidentiality
 - ▶ equal opportunities
 - ▶ reporting of accidents
 - ▶ health and safety
 - ▶ whistleblowing
 - ▶ safeguarding
 - ▶ storage and dispensing of medicines.
- 2 Any three from:
 - ▶ provide quality standardised care for all patients and service users
 - ▶ ensure safety of all service users
 - ▶ prevent errors
 - ▶ provide consistency
 - ▶ promote health and wellbeing
 - ▶ ensure safety and wellbeing for practitioners.
- 3 Health and safety risks: poor standards of care; neglect; abuse; causing harm; injury, death of residents, patients, staff or visitors.

Harm to self and the individual: examples could be fractured limbs, food poisoning, disease, exposure to infection, burns; illness, disease getting worse.

- 4 Any three from:
 - ▶ The care provider could fail a CQC inspection.
 - ▶ The CQC publishes inspection reports which could rate the care provider as 'inadequate'.
 - ▶ The CQC can issue warning notices and fines if standards are not met.
 - ▶ Could result in increased monitoring of the setting, e.g. CQC, local authority inspections and re-inspections.
 - ▶ Requirement for individuals to undergo further training/retraining.
- 5 ▶ Individuals can be 'struck off' their professional register due to 'fitness to practise' concerns and not allowed to practise at all.
 - ▶ Practice may be restricted – they may be limited in what they are allowed to do.
 - ▶ Loss of professional status and reputation.

A2.9

- 1 Evidence-based practice is about making better decisions and providing the best standard of care by considering all the facts, knowledge, data, statistics, etc. that are available and using them as a basis for making a decision.
- 2 Any three from:
 - ▶ facilitates improvements in person-centred care
 - ▶ improves outcomes for individuals
 - ▶ improves safety
 - ▶ promotes equality in provision
 - ▶ informs health promotion requirements.
- 3 Any two from:
 - ▶ encourages quality provision
 - ▶ improves cost effectiveness
 - ▶ improves capability and competency of the workforce.

A2.11

- 1 ▶ Scope of role
 - ▶ Purpose of role
 - ▶ Responsibilities
 - ▶ Reporting lines
 - ▶ Accountabilities
- 2 Essential: the ability and knowledge needed to do a specific task or type of work. Desirable: other skills that the employer would like but are extra to the main skills needed.
- 3 Qualities or characteristics that someone has, for example, confidence, cheerfulness, trustworthiness, a willingness to learn.

A2.13

- 1 Any three from:
 - ▶ pandemic/epidemic/endemic diseases
 - ▶ extreme weather
 - ▶ infrastructure
 - ▶ geographical events, e.g. fires, floods and earthquakes
 - ▶ government policy.
- 2 Possible answers include:
 - ▶ Nearly a third of hospitals have seen long waits balloon, with more than 10 per cent of patients going a year without treatment.
 - ▶ There has been major disruption to cancer services, with some hospitals struggling to treat half of their patients within the target time of two months.
 - ▶ Concern is growing for 45 000 'missing cancer patients' after drops in GP referrals and screening services across the UK.
- 3 To ensure readiness of health facilities to cope with the challenges of a disaster, hospitals and other healthcare organisations have to be well prepared and should have a disaster recovery plan.
- 4 Examples include:
 - ▶ communications
 - ▶ resources and assets
 - ▶ safety and security
 - ▶ staff responsibilities
 - ▶ utilities management.

A2.14

- 1 World Health Organization.
- 2 ▶ Aims to building a better, healthier future for people all over the world.
 - ▶ The organisation's major role is to direct and coordinate international health within the United Nations system.
 - ▶ The main areas of work are: health systems; health through the life-course; non-communicable and communicable diseases; preparedness, surveillance and response.
 - ▶ In addition to medical doctors, public health specialists, scientists and epidemiologists, WHO staff include people trained to manage administrative, financial and information systems, as well as experts in the fields of health statistics, economics and emergency relief. Working together, they aim to help achieve health objectives by supporting national health policies and strategies.
- 3 UK Health Security Agency.

- 4 Any four from:
- ▶ local health protection teams to deal with infections and other threats
 - ▶ support and resources for local authorities to manage local outbreaks
 - ▶ the COVID-19 testing programme
 - ▶ contact tracing
 - ▶ the Joint Biosecurity Centre
 - ▶ emergency response and preparedness to deal with the most severe incidents at national and local levels
 - ▶ research laboratories and associated services
 - ▶ specialist epidemiology and surveillance of all infectious diseases
 - ▶ global health security
 - ▶ specialistic scientific advice on immunisation and countermeasures.
- 5 Any two from:
- ▶ Public health is concerned with protecting, and improving, the health of the population rather than focusing on the health of the individual.
 - ▶ Public health and wellbeing are promoted to benefit society as a whole and to reduce health inequalities.
 - ▶ Improves each generation's prospects.
 - ▶ Raises public awareness of risks.
 - ▶ Reduction of pressure on the NHS.
 - ▶ Educates people on how to live healthier lifestyles and self-care.
 - ▶ Reduces numbers of people impacted by health issues and preventable illness.

Assessment practice

- 1 ▶ Community health services include pharmacies, hospices, nursing homes, home care agencies, voluntary sector services and carers.
- ▶ Community health services provide support across a range of needs and age groups but are most often used by children, older people, those living with frailty or chronic conditions, and people who are near the end of their life.
- ▶ Community services often support people with multiple, complex health needs who depend on many health and social care services to meet those needs.
- ▶ The increasing numbers of people living longer and with long-term conditions mean that more people are likely to need support from community health services in the future.

Barrier	Example
Socioeconomic	Live in a deprived area, unemployed/low income Can't afford cost of some services, e.g. dentist Cost of public transport to get there/expensive parking Don't want to/can't afford to take time off work Unaware of services/poor education Unfamiliar with/don't understand medical terminology/jargon
Psychological	Fear of diagnosis Embarrassed about their health problems May feel there is stigma in using the service Anxious/scared, e.g. of dentists
Geographical	No local services Lack of transport to get there, e.g. not on a bus route Waiting lists – may be a long wait for services in some areas

- 3 Public health protection involves protecting the nation from public health hazards by preparing for and responding to public health emergencies. It also involves improving the health of the whole population by sharing information and expertise and by identifying and preparing for future public health challenges.

The public health approach is unlike a disease-oriented approach, which focuses on interventions for a single condition, often at a single life stage. Addressing the wider influences on health helps to improve the overall health of the population by helping to improve the conditions into which people are born, live and work.

Conclusion: Public health is concerned with protecting, and improving, the health of the population rather than focusing on the health of the individual. Public health and wellbeing are promoted to benefit society as a whole and to reduce health inequalities. By altering government strategies and approaches to healthcare, the negative effects of environments and inequalities impacting the population can be reduced, which could benefit the whole population across their lifespan, as well as future generations.

- 4 A charity organisation is a business whose aim is not to make money for directors, owners or shareholders; rather, its purpose is to provide help and support for individuals in need. Services are mainly provided by volunteers who do not get paid and who give their time for free. They can provide specialist care and support for no charge. They can offer important advice and support services which are additional to NHS services, which can be stretched.

Specialist help and advice are available for many conditions and situations – consider charities such as Mind (mental health), Dementia UK, British Heart Foundation, Childline.

- 5 Any four from:
- ▶ a smaller incision
 - ▶ less damage to healthy tissue
 - ▶ less pain
 - ▶ shorter hospital stay
 - ▶ less visible scars
 - ▶ faster recovery and return to normal activities.
- 6
- ▶ GP surgery – primary
 - ▶ Hospice – tertiary
 - ▶ Hospital maternity department – secondary
 - ▶ Optician – primary
 - ▶ Physiotherapy clinic – secondary
 - ▶ Residential nursing home – tertiary
- 7 Individual – the implant provides constant reassurance, quick checks can be made whenever needed by downloading monitoring data, improved quality of life, alarm goes off if there is a problem with medication, for example, easy to download data to the hospital.

NHS – cost-effective, remote monitoring reduces hospital visits and so saves specialists time, enables close monitoring of the effects of medication – it is easier to determine if changes are needed, easy access to monitoring information.

- 8
- a** Any two appropriate policies, e.g. confidentiality, dispensing of medicines, health and safety, equal opportunities, safeguarding, whistleblowing, reporting of accidents, lone working.
- b** Following policies and procedures is a requirement of the role of a healthcare worker. Most policies and procedures are in place to protect service providers and service users from harm and to protect their rights. Other reasons include:
- ▶ Following policies helps provide quality, standardised care for all.
 - ▶ They ensure the safety of all staff and service users.
 - ▶ Policies help to prevent errors.
 - ▶ Policies help to achieve consistency of care.

- 9 Evidence-based practice is about making better decisions and providing the best standard of care by considering all the facts, knowledge, data, statistics, etc. that are available and using them as a basis for making a decision.
- 10
- ▶ During a disaster situation, hospitals and other healthcare settings must continue to provide essential medical care to their communities.
 - ▶ Any incident that causes loss of infrastructure or causes a patient surge, such as a natural disaster, terrorist act, or chemical, biological or explosive hazard, requires a response and recovery plan which enables the continuing provision of healthcare.
 - ▶ Without appropriate emergency planning, local health systems can easily become overwhelmed while attempting to provide care during a critical event.
 - ▶ Limited resources, a surge in demand for medical services, and the disruption of communication and supply lines create a significant barrier to the provision of healthcare.

A3: Health, safety and environmental regulations in the health and science sector

Test yourself

A3.1

- 1 Environmental Protection Act (EPA) 1990.
- 2 RIDDOR 2013 is the main set of regulations, together with Management of Health and Safety at Work Regulations 1999. In addition, the Personal Protective Equipment at Work (Amendment) Regulations 2022 and Manual Handling Operations Regulations 1992 are relevant.
- 3 COSHH Regulations 2002, Special Waste Regulations 1996 and Hazardous Waste Regulations 2005.
- 4 An accident is 'work-related' if any of the following played a significant role: the way the work was carried out; any machinery, plant, substances or equipment used for the work; the condition of the site or premises where the accident happened.
- 5 The following injuries are reportable under RIDDOR when they result from a work-related accident: the death of any person; specified injuries to workers; injuries to workers which result in them being unable to work for more than seven days; injuries to non-workers which result in them being taken directly to hospital for treatment, or specified injuries to non-workers which occur on the premises.
- 6 Both.

A3.2

- 1 Something that has the potential to cause harm.
- 2 1 Identify the hazards. 2 Decide who might be harmed and how. 3 Evaluate the risks and decide on precautions. 4 Record findings and implement them. 5 Review the assessment and update if necessary.

A3.3

- 1 Any three from:
 - ▶ encouraging individuals to take reasonable care of their own and others' safety
 - ▶ modelling good practice (leading by example)
 - ▶ providing clear organisational policies and SOPs
 - ▶ ensuring there is clearly visible information and guidance
 - ▶ maintaining equipment and removing faulty equipment
 - ▶ ensuring working environments are clean, tidy and hazard free
 - ▶ providing statutory training.
- 2 Any three from:
 - ▶ taking care of their own and others' safety
 - ▶ following organisational policies and SOPs
 - ▶ following processes for recording and reporting issues and concerns
 - ▶ following correct manual handling techniques
 - ▶ ensuring working environments are clean, tidy and hazard free
 - ▶ appropriately storing equipment and materials
 - ▶ completing statutory training.
- 3 Badly maintained equipment increases the likelihood of failure and can become a serious hazard. Faulty equipment can represent a hazard.
- 4 Items on the floor can be a trip hazard; unnecessary items can conceal other hazards; the need to move items to get at other things can be a hazard; dirty work areas can be a source of chemical or bacterial contamination.
- 5 Any three from:
 - ▶ How heavy are the boxes?
 - ▶ Can I lift them safely or do I need specialist equipment?
 - ▶ Are there any obstacles on the route?
 - ▶ Are the shelves too high for me to safely lift the boxes onto?
- 6 When new people start work; when there is exposure to new or increased risks; when existing knowledge or skills have become rusty or out of date.

A3.4

- 1 Any three from:
 - ▶ Use a chemical spillage kit.
 - ▶ Use appropriate PPE.

- ▶ Consider whether you have the training and capability to deal with the situation.
 - ▶ Consider whether it is necessary to evacuate the area.
 - ▶ Secure the area.
- 2 If the situation is too hazardous to deal with yourself.
 - 3 C To investigate the cause and learn safety lessons.

Assessment practice

- 1 Everyone – management and employees.
- 2 As far as reasonably practicable.
- 3 The SOPs would normally be written first, but the risk assessment might mean that changes are needed in the SOPs.
- 4 A = W; B = X, Y and Z
- 5 A half-day induction may not allow sufficient time for proper health and safety training. Five years may be too long between refresher courses. A longer induction process should be introduced to allow for full health and safety training. More frequent refresher training should be introduced. Training should be offered to temporary staff, visitors, etc. Training should be provided when somebody changes job or the nature of their job changes.
- 6 The HR department may not have the necessary skills or information to prepare risk assessments. The production department should have the necessary expertise to prepare the SOPs. Putting risk assessments and SOPs on the company intranet is not enough to make all staff fully aware. Staff training will need to be carried out to ensure SOPs are understood and used consistently. The company should introduce a monitoring procedure to ensure SOPs are followed consistently. As the company is new it may need new SOPs as it introduces procedures or processes.
- 7 Because all steps should be taken to minimise risk, only then should appropriate PPE be used.
- 8 EPA would require that disposal does not cause pollution. COSHH would require full assessment and control of risk before starting and ensuring that procedures are followed to prevent harm to employees, the public or the environment. Manual Handling Operations Regulations 1992 would require you or your employer to consider any risk involved in lifting, carrying, moving or emptying containers.
- 9 RIDDOR requires all accidents to be recorded if they lead to an employee being unable to work for more than three days. Accidents need to be reported only if they lead to an employee being unable to work for more than seven days. Reportable injuries must always be reported. These include death and a list of specified injuries.

- 10 They would need to consider WEEE, which controls the transport and disposal of all electrical and electronic equipment. They would also have to consider whether any chemical hazards were present; these might be covered by COSHH, the Special Waste Regulations 1996 and the Hazardous Waste Regulations 2005. They would also need to consider the Manual Handling Operations Regulations 1992 as these would cover handling and moving equipment.

A4: Health and safety regulations applicable in the healthcare sector

Assessment practice

- 1 **a** Employers must provide adequate and appropriate equipment, facilities and personnel to ensure their employees receive immediate attention if they are injured or taken ill at work.
b Local authorities are required to provide services that improve people's independence and wellbeing.
- 2 **B** Employees have a duty to co-operate with their employer to protect themselves and others from the harmful effects of ionising radiation.
- 3 Vaccines are subject to the same approval process as all medicines, under the authority of the MHRA. They are tested extensively in clinical trials for safety and efficacy. Like all medicines, vaccines are given only when the benefits outweigh the risks. Even after approval, the MHRA monitors all medicines, including vaccines, for very rare side-effects that may not have been discovered during the clinical trials.
- 4 If items are being taken, the colleague should have reported it to their line manager, otherwise they risk being accused of theft themselves. It is the employee's responsibility to make sure their first-aid box is fully stocked, but the employer must pay for the contents.
- 5 If someone stops breathing or suffers a cardiac arrest, there is a very limited time available before they suffer permanent damage or even death. If someone does not have a pulse or has stopped breathing, it is essential that they can receive CPR as quickly as possible.
- 6 You must ensure that any action you take does not harm you or the patient. Besides making them comfortable and ensuring there is no immediate risk to life, you should not attempt to move them unaided but call for help from a colleague.

A5: Managing information and data within the health and science sector

Test yourself

A5.1

- 1 **a** Closed **b** Closed **c** Open
- 2 **a** Public databases or official statistics
b Survey
c Practical investigation
d Observation

A5.2

- 1 Qualitative data is descriptive or text-based, quantitative data is numerical.
- 2 Data can be collected without the need to be present; data can be captured continuously, for long periods if necessary; once captured by the computer, the data can be analysed and processed.
- 3 **a** In a table with one column for each day's measurement and one row for each patient. A mean (and possibly standard deviation) could be calculated for each patient, and this would be put in the rightmost column.
b As a scatter graph to see if there is any correlation between the two variables.
- 4 **a** A pie chart **b** A bar chart

A5.4

- 1 Advantages include the ability to control variables, repeat experiments and calculate a mean; one weakness is the possibility of over-applying or extrapolating the results from a simple system to a more complex one.
- 2 It will most likely have been subject to peer review.
- 3 Objective observations are things that can be measured, such as pulse, temperature or respiration rate. Subjective observations are signs that cannot be measured consistently, such as how a person or patient feels.

A5.5

- 1 **a** The use of algorithms to imitate the way in which humans learn.
b Computer systems where resources are distributed over many servers or data centres.
- 2 Mobile devices are in widespread use/they can be used for observation or data collection outside a laboratory situation/they can be used as the basis of track and trace applications.
- 3 They provide an audit that can assist with ensuring patient confidentiality.

- 4 They can take data from multiple sources and present it in a way that makes it easier to understand.

A5.6

- 1 Data Protection Act 2018 and General Data Protection Regulation (GDPR) 2018 (retained in domestic law as the UK GDPR).
- 2 **C** Providing a patient's medical history to an intensive care doctor when the patient is in a coma. (D would be acceptable only if the destination country had equivalent data protection standards.)

A5.9

- 1 Benefit: ease of access to data, speed of analysis, standardisation, real-time monitoring, cost saving. Risk: data corruption, data theft/ransomware, patient confidentiality can be compromised.
- 2 By making it easier to share data and it enables collaborative working.

Assessment practice

- 1 **a** Quantitative **b** Qualitative
c Quantitative **d** Qualitative
- 2 **a** Continuous (you can have fractions of a week)
b Discrete (you cannot have fractions of a child)
c Continuous (the average can be any number, including fractions)
d Discrete
e Continuous
- 3 Any two from:
 - ▶ Restrict access to only authorised people.
 - ▶ Use password protection of files or screens.
 - ▶ Use regular backup procedures.
 - ▶ Implement effective cyber security measures.
 There are several other 'correct' answers.
- 4 Any two from:
 - ▶ Data can be collected without the need for a human operator to be present.
 - ▶ Data can be captured continuously, for long periods if necessary.
 - ▶ Once captured by the computer, the data can be analysed and processed.
- 5 You should discuss both closed-question and open-question surveys and the difference between them as well as their advantages and disadvantages. Other points to include might be the methods of data collection (online surveys, interviews) and their ease or difficulty, as well as the analysis of the data collected.
- 6 You should describe how machine learning can be used in diagnosis; this can be viewed as removing the role of the practitioner, or as taking away routine or laborious tasks, giving them more time for patient care. Other topics might include the role of proteomics

and DNA sequencing (genomics) in researching the causes of disease or its diagnosis.

- 7 You should describe the risks of unauthorised access to patient data, such as loss of confidence by patients, possible breaches of the Data Protection Act 2018/ GDPR 2018. You should also cover the importance of policies – so that everyone knows what steps they should take to protect patient data and what their responsibilities are.
- 8 You should describe different security measures such as controlling access to data, but also cover ways in which the integrity of the data is maintained – these include performing regular backups of data, keeping data backups 'off-site' or in the cloud, and guarding against cyber attack.

A6: Managing personal information

Test yourself

A6.1

- 1 Any four from:
 - ▶ completed as soon as possible after care/ medication provided
 - ▶ exact details of care provided or medication administered
 - ▶ no gaps in information provided
 - ▶ succinct
 - ▶ legible handwriting
 - ▶ only using agreed abbreviations
 - ▶ using patient's actual words.
- 2 Any one from:

The Data Protection Act 2018, including the provisions of the General Data Protection Regulation 2018 (GDPR)

 - ▶ Emphasis on 'consent' so information should be shared only if the individual has given permission.
 - ▶ Limits how long information should be kept, states that information should be kept 'no longer than necessary' and should be deleted or destroyed, e.g. shredded, when it is no longer needed.
 - ▶ All staff have the responsibility for ensuring that confidential information is kept securely and not disclosed inappropriately.

The Care Act 2014

 - ▶ Gives Local Authorities responsibility to ensure that appropriate information is shared to assist in multi-disciplinary team working.

The Human Rights Act 1998

 - ▶ Provides individuals with the right to 'respect, privacy and family life'. This supports maintaining confidentiality of information in care settings to ensure an individual's privacy.

The Equality Act 2010

- ▶ Identifies nine 'protected characteristics' which it is illegal to discriminate against someone for having. This means, for example, information about someone's sexuality must never be shared without their consent, to avoid them being treated differently because of it.

The Freedom of Information Act 2000

- ▶ Gives individuals the right to view any information kept about them by public bodies, such as the UK Government, the NHS and Local Authorities. This includes documents, reports and e-mails between co-workers.
- 3 Abbreviations are open to misunderstanding as people may not be familiar with them. Some abbreviations may mean different things in different care settings and so may cause confusion.
 - 4 Check with someone more senior. Always ask your supervisor, or another senior member of staff in the department if your supervisor is not available.
 - 5
 - ▶ Ensure information is legible where records have been recorded by hand, using black ballpoint pen.
 - ▶ Ensure all records have a date, time and signature.
 - ▶ If using electronic systems, ensure care is taken to enter data records accurately.
 - ▶ Your main responsibility is to ensure that any record keeping that you carry out is done accurately, so for digital records enter information carefully. Do not type too fast as errors are more likely to occur.

A6.3

Student's own answers.

A6.7

- 1 Presentation – can include video clips of good practice to break up slides of written information. A more engaging format than a printed handout. Can be emailed to everyone so they have it to refer to in future.
- 2 Social media – inappropriate format for important information that must be followed and is a legal requirement for data protection. Lacks serious emphasis.

Assessment practice

1 Timely:

- ▶ The longer it is left, the less likely it is that the record will be fully accurate.
- ▶ Completing records too long after an event can result in gaps in the information due to not remembering exactly what happened.
- ▶ The information may be time sensitive and needed urgently in order to continue providing appropriate care.

Accurate:

- ▶ Incomplete or muddled record keeping can have serious consequences for patients if something is misunderstood.
 - ▶ Type of care given must be provided so that there is an accurate record of all interactions and treatments.
 - ▶ Accurate records of administering medication are essential to avoid double doses, for example, which could have serious consequences for the patient and the member of staff.
 - ▶ For accuracy it is preferable to use patients' actual words, with quotation marks.
- 2
 - a Always ask your supervisor, or another senior member of staff in the department if your supervisor is not available.
 - b Records of individuals using care services and staff records are confidential and so must be kept safe and secure. Never leave folders or reports lying around, always log out of electronic records and never move away from the computer leaving documents open. To maintain proper security, those who need to access electronic records will have been given a password.
 - 3 Always log out of electronic records when you have completed your task; never walk away leaving information on show. Electronic records are usually password protected – you must never share the password with anyone. Anyone who needs and is permitted to access electronic records will have been issued with a password.
 - 4 Legislation: Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR). This piece of legislation requires organisations to have recording and reporting systems in place to enable the efficient reporting of workplace injuries, diseases and accidents. This law states that records must be kept of any accident, occupational disease or dangerous occurrence that is specifically listed in the legislation, and any other accident that results in a worker being absent for more than seven consecutive days. The employer's records must state the following:
 - ▶ date, time and location of the event
 - ▶ details of the individuals involved
 - ▶ a summary of what happened
 - ▶ details of the injury/illness that resulted.

Employers must report the full details to the Health and Safety Executive. The HSE will review the report and this may result in an investigation. So, it is essential that accurate records are kept and are readily available.

- 5 Using common abbreviations enables patient records to be produced more quickly as whole words will not have to be written out repeatedly – for example, PRN

(pro re nata) meaning 'give as needed' which would refer to medication. Also, the records will be shorter due to fewer words being used, which means they take less time to create and to read.

However, they are open to misunderstanding and may mean different things in different care settings. For example, DNR could mean 'do not resuscitate' or 'district nurse referral'. You should never use your own abbreviations as it is unlikely that others will know the meaning. Only use abbreviations that you have been told to use by your supervisor which are appropriate for the setting and/or records in question.

Using abbreviations can save time when record keeping, you do not have to write out certain details fully, and as long as everyone is familiar with the meaning of the abbreviations being used it can be more convenient.

- 6 An audit is when a review or inspection is carried out to ensure compliance with regulations, policies or legislation. In a healthcare setting an audit could be carried out to check whether staff are following record-keeping policies and procedures. This helps to identify good practice and also to indicate whether any improvements are required.

Accurate record keeping also helps to provide an 'audit trail', i.e. a clear path of evidence showing what actions have been taken, when and by whom, which would be especially useful in any investigation about misconduct, abuse or an accident.

Main responsibilities include ensuring that any record keeping is done accurately, so for digital records, information must be entered carefully. Do not type too fast as errors are more likely to occur. There should be an accurate and legible record of the date and time of what is being done. Use a black pen and print if your handwriting is difficult to read.

- 7 Oral report: this is spoken information and is useful and efficient when information needs to be summarised and passed on quickly. An example is the shift changeover on a hospital ward. This is called the 'handover'. The nurse in charge will speak to the new team, giving an overview of patients on the ward so that the staff taking over have all the key information to start looking after the patients straight away. Any issues or problems will be flagged and a brief review of the condition of each patient will be given.

Written report: this can be on paper or in an electronic format. The report could be a family's record of interactions with a social worker or test results sent from the hospital to a GP. Written information is

usually more detailed than an oral report and can provide a permanent record of information over time.

Presentation: this is usually delivered with the aid of slide shows, presented on a screen to a group of people, but could also involve video or audio. The presenter talks through the slides, giving a commentary. The slides can include pictures, diagrams, charts and written information. Presentations are useful for the delivery of training or providing information for a group of people. Quite a lot of information can be given, with the benefit that it can be revisited easily at a later date if delegates are sent a copy. Presentations can be used for sharing good practice in a team meeting or reporting the results of a research project.

- 8 For example:

- ▶ Purpose limitation: information should be collected for a specific purpose only. Organisations such as the NHS and health and social care settings can hold information about staff and clients for a clear purpose and must use it only for that purpose.
- ▶ Storage limitation: information should be kept for no longer than necessary. Data should be deleted or destroyed when it is no longer needed – for example, staff should securely delete or shred sensitive or personal data.
- ▶ Lawfulness, fairness and transparency: people have a right to know and view any information that is being held about them, to know how their information is being used, to have errors corrected and to prevent any data being used for advertising or marketing.

- 9 A client history consists of factual information about the person. It establishes relevant background information about their life and gathers information about their lifestyle that can contribute to developing an understanding of their illness or condition. Further details are needed to gain an insight into the person's state of health and their circumstances. These details include:

- ▶ Presenting complaint: a description of any symptoms that they are experiencing and that are concerning the individual.
- ▶ Drug history: this includes details of any prescribed or over-the-counter medicines they are taking. Information about recreational drug use is also relevant.
- ▶ Family history: are they a parent? Do they have any dependants, that is family members or others relying on them for financial or other support? Do they work and if so, what type of employment? What type of housing do they live in?

These aspects of the individual's family, work responsibilities and their type or standard of housing could have an influence, either positive or negative, on their state of health. Poor (or lack of) housing, stress and pressure at work or with family responsibilities could be having a negative impact. Equally, the individual may have extended family and friends who are available for support if required.

- 10 There are situations when information must be shared for the purpose of ensuring effective diagnosis, treatment and care of individuals, such as a handover briefing at the shift change on a hospital ward. Other occasions are when there is risk of harm to individuals, for example, in a serious situation regarding someone's mental health or in an emergency healthcare event such as a seriously injured child, or if a crime has been committed or there is a risk of it being committed – for example, the misuse of medication. Safeguarding issues, such as suspected harm or abuse of a child or older adult, would have to be shared following safeguarding procedures.

In some situations, however, it is helpful and beneficial to share information with colleagues. These could involve successful projects or initiatives, or successful everyday care practice that care workers can share with their colleagues.

Important considerations include the reason why information is being shared, for example, to support the individual's care or to present outcomes of a project. Is it essential or desirable to share the information? It is necessary to inform the individual that the information needs to be shared and why. The individual must be asked for consent unless it is required by law to share or the benefit in sharing information outweighs keeping it confidential (for example, safeguarding risks). Where the age or mental capacity of the individual is of concern, there may be a need to inform an appropriate adult or advocate if sharing an individual's information.

A7: Good scientific and clinical practice

Test yourself

A7.3

- 1 A set of sequential steps or instructions designed to standardise the approach to a process or action.
- 2 Any two from:
 - ▶ to maintain health and safety because SOPs will have been subject to a risk assessment

- ▶ to ensure consistent outcomes or performance because processes or procedures are carried out in a consistent way
- ▶ because there might be legal or organisational requirements to follow an SOP
- ▶ because professional bodies might require adherence to correct procedures
- ▶ so that you can show compliance with required standards for audit purposes.

- 3 Any two from:

- ▶ Procedures might be carried out in an unsafe way.
- ▶ The method used may be inconsistent.
- ▶ You may fall foul of legal or organisational requirements, making you subject to legal or disciplinary action.
- ▶ You may fall short of the requirements of professional bodies.
- ▶ You may not be able to show compliance in the event of an audit or inspection.

- 4 So that there is documentary evidence of compliance in the event of an audit or inspection.

A7.4

- 1 **a** Centrally or locally in each department.
b Either in hard copy or electronically, e.g. on an intranet or other network.
- 2 Any two from:
 - ▶ Methods may have changed.
 - ▶ Equipment or processes may have been updated.
 - ▶ Regulations may have changed.
 - ▶ Roles and responsibilities may have changed.
- 3 Controlling the production and distribution of SOPs; maintaining a central deposit that can be accessed but not removed or downloaded; maintaining a central index or database.
- 4 To show that everything has been done correctly and to provide an audit trail in case something goes wrong.

A7.5

- 1 By preventing transmission through contaminated surfaces (fomites), such as hard surfaces (door handles, handrails, light switches, mobile phones) or fabrics (clothing, towels and furnishings); through aerosols, produced by breathing, coughing or sneezing; by preventing accumulation of waste, rubbish, dirt, etc. that can provide a breeding ground for infectious microorganisms or for vermin that can be vectors for disease.
- 2 Microbial cultures may become contaminated with other microorganisms that compete; samples can be contaminated during the sampling process or during transport or storage; analytical reagents can be contaminated which may invalidate any analysis performed using them.

A7.7

- 1 Any two from:
 - ▶ There could be risks to health and safety.
 - ▶ Results could become invalid.
 - ▶ Work could become less efficient.
 - ▶ Equipment could be damaged.
- 2 One that is close to the true value.
- 3 Because it reduces the uncertainty in any measurement.

Assessment practice

- 1 Consistency, predictability, reproducibility, reliability and ensuring the health, safety and wellbeing of ourselves and others.
- 2 Any two advantages from:
 - ▶ The SOPs are more easily available.
 - ▶ The SOPs can be found more easily by database searching.
 - ▶ It is easier to use version control to ensure that all SOPs are the most up to date.
 - ▶ It is easier to incorporate online/electronic logging or auditing.
 One disadvantage from:
 - ▶ If the system goes down, SOPs will not be available.
 - ▶ People may be tempted to print out their own copies, which then may be outdated.
 - ▶ Version control might be easier with a system of issuing new versions of SOPs in exchange for previous versions.
- 3 Lack of calibration might lead to inaccurate measurements. This could have an impact on product quality/patient safety. It could also have financial or legal implications if the organisation does not meet legal/customer/stakeholder requirements.
- 4 **D** Put a note in the equipment log to say that it is not working correctly.
- 5 Sofia is correct because calibration of a piece of equipment will make the measurement closer to the true value.
- 6 The package should be opened as soon as possible in case special storage is required. The product label or accompanying data sheet (if present) should give details of how the product should be stored, e.g. at +4 °C or –20 °C or protected from heat or light.
- 7 Any two from:
 - ▶ Inaccurate temperature measurement could lead to a possible infection being missed, meaning the patient does not receive appropriate medication.
 - ▶ Wrong or unnecessary blood tests might be ordered that are not needed for this patient.

- ▶ Accurate records ensure that prescribed medication is given at the right time or correct dose, otherwise the patient's chemotherapy medication may be ineffective.
 - ▶ Accurate blood pressure recording allows identification of a wide range of health issues that might have an impact on the patient's cancer.
- 8 Follow the SOP. This might include steps such as: ensure the vials are clean and securely closed (most are self-closing nowadays, but you should always check), ensure they are correctly labelled and matched with patients' records, ensure they are transferred as quickly as possible, store at 4 °C overnight if they cannot be transferred the same day, ensure they reach the analytical lab within 24 hours of being taken.
 - 9 Any two from:
 - ▶ There might be duplication, meaning more stock is carried than is required.
 - ▶ Some items may require special storage facilities that may not be present/may be more efficient if centralised.
 - ▶ Effective stock rotation may be more difficult.
 - ▶ Perishable items such as insulin may not get used before their expiry dates.
 - 10 Proper stock control is essential for health and safety of staff/patients/public. Inadequate stock control may lead to increased costs while proper stock control may make savings.

A8: Providing person-centred care**Test yourself****A8.3**

- 1 **a** Regulatory inspections enable service users to be informed about the quality and standard of care.
b Reassurance that the services being provided are of the required standard, which promotes trust in the organisation because an external body has carried out checks.
- 2 **a** Health and Safety at Work Act.
b The Health and Safety Executive (HSE).
- 3 ▶ Provides guidance for maintaining data protection in care settings and explanations of data protection legislation, such as GDPR regulations.
▶ Website has 'At a glance' summaries, for example, data protection involving children.
▶ Provides checklists organisations can use to review their data protection policies and procedures.
▶ Carries out audits and advisory visits across health organisations in relation to personal data and produces reports indicating areas of concern, good practice and recommendations for future practice.

A8.6

- 1 Personalisation means to put the individual first in the process of planning, developing and providing care. It involves creating tailored support to the individual needs and desires. Person-centred care ensures the individual is involved in decision-making by discussing their care needs and then providing them with, for example, information about different options available that will meet their needs. The individual can then choose care that they prefer. This is enabling and empowering, ensuring the individual is at the centre of their care and has choice and control.
- 2 Any three from:
 - ▶ The person is at the centre of the planning process, which is based on their individual preferences and identified needs.
 - ▶ Family and friends can be partners in the process.
 - ▶ The plan will identify what is important to the person, both in the present and in the future, helping them to make informed choices.
 - ▶ The plan helps the person to achieve what they wish for individually and in the community, e.g. continue to work with a physical disability.
 - ▶ The plan is reviewed and adapted over time as needed to continue to meet the person's changing care needs.
- 3 Physiological needs, safety and security, love and belonging, self-esteem, self-actualisation.
 - ▶ Physiological – meeting basic needs such as food and drink, warm and comfortable accommodation.
 - ▶ Love and belonging – welcomed by other residents/patients/staff. Visits from family.
 - ▶ Self-esteem – being consulted about any care needs and having choice and control to make own decisions.

A8.8

- 1 Capacity is the ability to make a decision. It involves understanding information and remembering it for long enough to make a decision and to be able to communicate it to others.
- 2 Any two from:
When:
 - ▶ the person lacks the capacity to consent to care arrangements
 - ▶ the person has a serious mental disorder
 - ▶ the arrangements are necessary to prevent harm for the individual
 - ▶ the arrangements must be proportionate to the likelihood and severity of harm.
- 3 To:
 - ▶ introduce a simpler process that involves families more and gives swifter access to assessments

- ▶ be less burdensome on people, carers, families and local authorities
- ▶ allow the NHS, rather than local authorities, to make decisions about patients, allowing a more efficient and clearly accountable process
- ▶ consider restrictions of people's liberties as part of their overall care package
- ▶ get rid of repeat assessments and authorisations when someone moves between a care home, hospital and ambulance as part of their treatment.

Assessment practice

- 1 Care professionals have to be 'registered' by their professional body in order to practise within that profession. The regulatory body, such as the Nursing and Midwifery Council, sets standards which the care professional must meet in order to achieve registration and practise. The standards include, for example, a specified number of hours of CPD (continuing professional development) to ensure knowledge and skills are kept up to date.
- 2 Any four from:
 - ▶ There is transparency about the standard of services being provided.
 - ▶ The public know that independent checks are carried out.
 - ▶ Gives people confidence in quality of health and care services.
 - ▶ The rating grade for an inspection may help individuals to choose whether or not to use that service.
 - ▶ The ratings enable individuals to compare services and care settings.
 - ▶ The strengths of the quality of care provided are identified.
 - ▶ Helps practitioners do their job effectively – they know what needs to improve.
- 3 Principles: empowerment, protection, prevention, proportionality, partnership, accountability.
Examples in practice:
 - ▶ Working together, Jamal, his mum, the supermarket manager and the key worker agree on a trial period, with support in place to see how Jamal gets on with the job. Review after a few weeks to see if extra support is needed or not (partnership, empowerment, proportionality, protection).
 - ▶ The supermarket provides a support colleague for Jamal to train and supervise him and to monitor how he is getting on (partnership, proportionality, prevention, accountability).

- 4 The CQC is the regulator of health and social care for England. It carries out inspections of care services such as hospitals, GP surgeries, care homes, community care services, mental health services and social service departments to ensure that care standards are being met. The role of the CQC includes registering and licensing care services to ensure essential standards of quality and safety are met.

The CQC carries out inspections of health and social care settings to monitor that the care provided continues to meet the standards required. It publishes inspection reports which rate care settings: 'outstanding', 'good', 'requires improvement', 'inadequate'. It issues cautions, warning notices and fines if standards are not met. Following an inspection, it provides recommendations of how the service can improve.

Where there are serious concerns about standards, the CQC can put a care provider into special measures – this means informing them of improvements which have to be made within a specified time and the CQC will carry out a reinspection within six months. Finally, it can close down a service, to protect service users, if the service does not improve and continues to provide inadequate care.

- 5 Social prescribing is when individuals are referred to support and help from the community, in order to improve their health and wellbeing. Sometimes known as 'community referral', it involves a range of local, non-clinical services. Examples include local support groups, where meeting people with the same problems provides peer support, and local activity groups (for example walking, knitting or swimming) that meet to improve mental health and general health and wellbeing.

- 6 Personalisation involves:
- ▶ meeting individuals' needs
 - ▶ choice and control
 - ▶ personal budgets
 - ▶ independent living
 - ▶ making informed decisions
 - ▶ being empowered.

Person-centred care ensures the individual is involved in decision-making by discussing their care needs and then providing them with, for example, information about different options available that will meet their needs. The individual can then choose care that they prefer. This is enabling and empowering, ensuring the individual is at the centre of their care and has choice and control.

The introduction of 'personal budgets' supports person-centred care as it is an amount of money the individual is awarded by the local authority to spend on the help they need. This helps them to achieve what is important

to them and supports their choice and control. The emphasis is on individuals being able to choose the services they want rather than having a fixed range of standard services, a 'one-size-fits-all' approach, which may not meet their needs as successfully.

- 7 The psychologist Abraham Maslow used a 'humanistic' approach, which is person-centred, focused on the individual and their needs. His theory created a hierarchy of human needs – it is a theory of human motivation.

The basic physiological needs that have to be met in order to survive, such as food, water and shelter, are shown at the bottom of the pyramid. Maslow's theory states that only when those basic physical needs have been met will a person have the motivation to progress to the next level of the pyramid.

When safety and security, followed by emotional needs, are met, a person will have the motivation to progress to trying to fulfil the higher-order needs for their personal development and achievement. Only then will a person 'self-actualise', that is, become the person they want to be.

- 8 Examples of communication barriers:

Visually impaired:

- ▶ information not available in different formats, e.g. Braille, large print.

Hearing impaired:

- ▶ hearing loop not available
- ▶ no staff available who have been trained in sign language/Makaton
- ▶ special methods such as PECS are not available
- ▶ individual can't lipread.

Examples of how to overcome the barriers:

- ▶ Use gestures or flash cards/pictures if appropriate.
- ▶ Make use of aids to communication such as a hearing loop system.
- ▶ Use communication appropriate to the individual – specialist communication methods such as Braille or signing.
- ▶ Use technological aids, such as Dynavox or a Lightwriter.
- ▶ Use positive body language, such as nodding agreement and making eye contact.
- ▶ Use active listening by demonstrating interest in response to what a person is saying, using body language to show a positive reaction.
- ▶ Use appropriate vocabulary, e.g. shorter words may be easier to lipread.
- ▶ Listen to their needs – use active listening.

- 9 Examples could include:

- ▶ counsellor
- ▶ faith support
- ▶ family/friends

- ▶ GP
- ▶ hospice staff
- ▶ Macmillan nurse
- ▶ occupational therapist
- ▶ practice nurse
- ▶ social worker.

10 The 6Cs are the key principles that underpin person-centred practice – Care, Compassion, Communication, Courage, Commitment, Competence.

Compassion/Care: many procedures in healthcare and social care require privacy, for example, showering and dressing someone or carrying out intimate procedures. It is vital to respect and protect the individual's privacy and dignity.

Competence: a practitioner must always act in the best interests of the individuals when carrying out their responsibilities and ensure their patients are kept safe from any harm.

Communication: essential for developing good relationships with service users, their families and also with colleagues. Being able to listen carefully and speak in a way that individuals receiving care and support can understand.

Courage: being brave and able to speak up about concerns; doing the right thing and having the courage to try something new, such as new ways of working.

Commitment: a care worker who is dedicated to providing care and support to meet individuals' needs.

throughout their lives. For example, there is to be more money available for primary care, meaning that patients will have treatment from their own GP if possible, instead of having to go into hospital.

2 According to the World Health Organization, a collaborative approach means 'multiple health workers from different professional backgrounds working together with patients, families, carers (caregivers), and communities to deliver the highest quality of care'. It is not just the NHS working in isolation but the whole community together, including the government and businesses. For example, a strategy to help a patient who has had a stroke return to their own home involves several professionals across the healthcare sector, as well as support from their family. While in hospital, the patient will be helped to walk and regain their strength with physiotherapy. The pharmacy will deliver their medication and an occupational therapist will go out to their home to ensure it is suitable for them to return to. When they return home their GP will visit them if there are any problems and the community nurse may assess their continence situation.

3 Individuals must be encouraged to self-manage their health and wellbeing as they will feel that they are making the decisions for themselves. They will feel empowered by their choices, making them much more likely to change their negative lifestyle than if someone else tells them what to do. Examples of poor lifestyle choices include smoking, drinking alcohol, poor diet and lack of exercise. At the same time, it should be noted that the lowest-income groups often have the poorest health outcomes. This could be due to the stress of living on a low income or barriers to accessing exercise facilities or opportunities to improve their diet.

Lifestyle choices can affect cardiovascular, nutritional, neurological and psychological health. For example, smoking and heavy drinking have been closely linked to a higher likelihood of developing cancer, heart disease and strokes. Having a poor diet can lead to malnutrition, cancer and heart disease. A sedentary lifestyle can lead to similar outcomes. Making healthy lifestyle choices can help an individual to live longer and avoid many serious illnesses.

- 4** Heart rate, respiratory rate, blood pressure, level of consciousness, oxygen saturation, temperature.
- 5**
- a** If the skin looks bluish or purple this can indicate a problem with oxygen (saturation).
 - b** Flushed skin can be an indicator of a fever or high blood pressure.
 - c** Very dry skin can indicate dehydration.

A9: Health and wellbeing

Test yourself

A9.2

1 The idea of the NHS Long Term Plan is that good health is about more than treating individuals when they are ill; it is about prevention of the illness in the first place. This plan emphasises how problems with ill health can be avoided by tackling health inequalities and by encouraging individuals to review their lifestyle choices. The NHS Long Term Plan sets out these health inequalities as:

- ▶ poor living environment
- ▶ poverty
- ▶ lack of life chances
- ▶ poor educational opportunities.

Furthermore, the aim of the NHS Long Term Plan is that there will be world-class care for everyone

A9.3

- 1 Proteins, carbohydrates, fats, vitamins and minerals.
 - 2 A contraindication is a reason that makes it inadvisable to combine certain foods with particular drugs. Food can affect some medicines taken by individuals depending what individuals eat or when they eat it. Taking a medicine at the same time as eating a certain food can cause the body not to absorb the medicine. Alternatively, certain foods may delay or decrease the absorption of the drug. For example, dairy foods such as milk, cheese or yogurt should not be combined with antibiotics. This is because the antibiotics combine with the calcium in the milk products to form an insoluble substance that the body is unable to absorb. Another example of food to watch out for is grapefruit, which has a negative impact when mixed with cholesterol-lowering medication.
 - 3 Monitoring of food and drink consumed helps healthcare workers to ensure that the individual has the proper intake of fluid and other nutrients. It is important that the individual has nutritious food in order to stay healthy. Monitoring of output helps determine whether there is adequate output of urine as well as normal defecation. If the individual is in danger of malnutrition and dehydration, the amount of food and fluid given and consumed by the individual should be recorded.
 - 4 The carer could work with the individual's family to ensure the individual has sufficient nutrition and hydration. Family members and carers can help by reinforcing what the healthcare professional has said to the individual about their feeding habits. They can also plan a strategy to use with the individual so that everyone follows the same plan to encourage good nutrition. For example, there could be a weekly menu for the individual so everyone knows what the individual will be eating every mealtime. This ensures consistency.
 - 5 A wide range of different professionals could work together to help with effective nutrition and hydration. They can help sort out any issues that the individual may have with eating. For example, if the individual has problems with their mouth or teeth, the dentist can help. A dietician could make suggestions for alternative dishes if the original menu does not suit the individual, perhaps suggesting liquidising some food, e.g. turning vegetables into soup if chewing is too difficult or takes too long, so they can still gain the nutrients found in vegetables. A GP could help to diagnose and treat indigestion.
- ▶ air pollution
 - ▶ smoking too prevalent
 - ▶ cyber bullying on social media
 - ▶ access to green spaces
 - ▶ childhood obesity
 - ▶ overcrowded homes
 - ▶ alcohol consumption
 - ▶ loneliness
 - ▶ lack of exercise.
- 2 An individual, as an adult, can maximise the chances of good health through habits such as:
 - ▶ not smoking
 - ▶ drinking in moderation
 - ▶ looking after their mental health
 - ▶ working or volunteering to improve a sense of self-worth
 - ▶ visiting the dentist for check-ups and attending regular screening appointments such as cervical smear tests.
 - 3 Individuals must be healthy mentally as well as physically. Small improvements in wellbeing can help reduce mental health problems. These improvements are known as 'The Five Ways to Wellbeing':
 - ▶ Be active – take part in an activity which is enjoyable for you.
 - ▶ Keep learning – learning new skills can give a sense of achievement.
 - ▶ Take notice of what's going on around you and be interested.
 - ▶ Connect with people, neighbours and family.
 - ▶ Give to people – even the smallest act can count, it could be a smile or a kind word.
 - 4
 - ▶ Poor waste management
 - ▶ Poor sanitation (e.g. access to clean water)
 - ▶ Lack of affordable housing
 - ▶ Pollution
 - ▶ Unable to access affordable energy sources
 - ▶ Difficulties accessing health and social care services
 - ▶ Difficulties accessing leisure and recreation facilities

A9.5

- 1 The NIHP was created in response to the emergence of the novel coronavirus (COVID-19). It was designed to be a new public health agency to protect the public against external threats to the UK, pandemics and infectious diseases. It was formed in 2021 by uniting the Public Health England (PHE), the Joint Biosecurity Centre and Track and Trace. NIHP continues PHE's health improvement and wider prevention work, supporting the government's stated aims of giving children the best start in life, tackling risk factors such as obesity and smoking (among others) and reducing health inequalities.

A9.4

- 1 Any five from:
 - ▶ badly maintained home
 - ▶ insufficient sleep
 - ▶ overuse of screen time

- 2 It saves money being wasted on producing resources which already exist. Other health promotion units which have run campaigns can also advise on what works and what does not.
- 3 Usually individuals visit their local GP surgery or healthcare centre when they are not well. They may need a consultation if they have a medical problem such as trouble breathing. This could be a good opportunity to advise them about giving up smoking as they may be more likely to try this if they feel that is what has caused their medical problem. It is not appropriate to pressurise the patient but merely a good opportunity to offer them access to the smoking cessation programme. Other areas to follow up could be taking the patient's blood pressure.

Social care practitioners could offer health-promotion advice to the service users they support. For example, a social worker may make suggestions to a family they are supporting on how to manage their budget to provide nutritious healthy meals. Alternatively, they may encourage an individual with special needs to partake in daily exercise to improve their mental health and physical fitness.

- 4 Many different charities are involved in health promotion, e.g. the British Heart Foundation offers exercise classes on YouTube. It also offers healthy eating information on its website and in leaflets.

Voluntary organisations can make a huge contribution in helping the NHS and other public bodies to deliver improved services. Small, locally-based charities and social enterprises often deliver preventative services that keep people away from hospital or GP appointments. They can offer community exercise groups, cooking healthy meals on a budget, mindfulness, etc. Even the national charities can offer localised services which reinforce the message given by national government agencies. Some argue that the NHS should be able to provide these services; however, where charities and voluntary organisations share common goals and have expertise in the relevant areas, it can be an effective method of supporting public health.

A9.6

- 1 Making better decisions by considering all the relevant and correct facts, statistics, etc. and using them as a basis for making a decision, rather than relying on assumptions or previous practice which is not effective.
- 2 MECC builds on the idea that the NHS is well placed to make small, brief interventions which could help someone change their lifestyle to the benefit of their health and wellbeing. These interventions could be as short as 30 seconds but are argued to be useful as healthcare staff could encourage and support patients,

suggesting other services which could help the individual if necessary. Mental, physical and emotional health and wellbeing could all be improved this way.

A healthcare professional may be able to address two or more issues in one meeting. For example, a young mother brings her school-age child into a clinic or GP surgery for immunisation. The healthcare professional may notice that the child has issues with their teeth and gums and may mention the fact to the child's mother. Having discussed the child's habits, the healthcare worker could suggest dietary changes such as reducing their refined sugar intake. This would be a very brief intervention as it might take only 30 seconds, but it could have a huge impact on the child's health if it could help to stop them developing serious problems. If, however, the mother needed more advice, she might have to be referred to the dietician or dental services, which would take a little longer and would fall into the category of brief intervention.

- 3
 - ▶ Stop smoking.
 - ▶ Drink alcohol within recommended units.
 - ▶ Eat healthily.
 - ▶ Be physically active.
 - ▶ Keep to a healthy weight.
 - ▶ Improve mental health and wellbeing.

A9.7

- 1 People who are overweight have a greater risk of developing type 2 diabetes, although people of any weight can develop it. Type 2 diabetes occurs when the body cannot make enough insulin or cannot properly use the insulin it makes. What an individual eats is an important factor: the risk of developing type 2 diabetes is increased by a diet full of quickly absorbed sugars and refined carbohydrates – the cells slowly become resistant to the effects of insulin so blood sugar or glucose will remain at a high level. Over time this can harm almost every organ in the body.
- 2 What an individual eats and drinks has a real effect on their heart and blood pressure. The healthier their eating habits are, the lower their blood pressure is likely to be (assuming no other relevant health conditions). If an individual does have high blood pressure, it is even more important to make healthy changes to their diet. If they take medicines for their blood pressure, then a healthy blood pressure diet can reduce the number of medicines they may need. For some individuals, following blood pressure-friendly eating habits may help them to avoid medicines altogether. Blood pressure can rise if an individual's diet contains too much salt. If the blood pressure remains high, over time there is a risk of the individual having a stroke.

- 3 Cardiovascular disease (CVD) is a general term for conditions affecting the heart or blood vessels. It is usually associated with a build-up of fatty deposits inside the arteries (atherosclerosis) and an increased risk of blood clots. It can also be associated with damage to arteries in organs such as the brain, heart, kidneys and eyes.
- 4 Vitamin A: night blindness and skin problems. Vitamin B-complex: beri-beri, skin problems, anaemia, muscle weakness, mouth ulcers. Vitamin C: scurvy, wounds take a long time to heal, may be liable to infections.

A9.9

- 1 A holistic concept of health considers the whole person rather than just the separate aspects of health. It recognises that each aspect of health impacts the others. It is very difficult to separate the aspects of health as they are interrelated and interdependent. For example, if a person is emotionally upset, their mental and physical health can be affected. So, too, could emotional and spiritual health.
- 2 Community-centred approaches are seen as successful by Public Health England NHS in tackling ill health. They provide value for money in that there will be less use of both GP and hospital services as well as a reduction in the use of prescription drugs. Community-centred approaches help people to feel part of society and empower them to access services and social resources. They may be particularly suitable for members of marginalised communities who feel less able to access traditional healthcare settings or face barriers in doing so. If individuals engage with others in their community, they are more likely to follow the direction given to them by people they know and trust.
- 3 Integrated care provides people with the support they need across local councils, the NHS and other partners. The idea is that barriers between GPs, hospitals and council services have been removed, meaning people no longer have disjointed care.

A9.11

- 1 Any three from: Parkinson's disease, Alzheimer's disease, age-related macular degeneration, arthritis, osteoporosis, osteoarthritis, rheumatoid arthritis, rheumatism.
- 2 Many older people may retire at 65 but increasingly people are working for longer. For some this may be an economic necessity, while others may feel they will lose their status and a sense of who they are when they retire. For example, a headteacher is no longer a headteacher or a factory manager is not a factory manager and they feel they have lost their

role in society. People often feel the loss of their purpose in life as well as their income, which can fall significantly, perhaps by half or even more. They may miss people and feel they have lost friends as they no longer see their work colleagues every day. For some who live with a spouse/partner who does not go out to work, there could be stress in their relationship with the spouse/partner who may be used to being at home by themselves during the day.

- 3 So that the mother can pass on immunity to the baby.

Assessment practice

- 1 According to current NHS advice, adults should do at least 30 minutes of moderately intense exercise for five days each week if they wish to improve their general health, so Barney needs to do at least 150 minutes of exercise each week, thus he is 100 minutes short of the NHS advice. Physical inactivity over a period of time can lead to increased risk of chronic disease and obesity. Exercise can help an individual to maintain lean tissue. Overweight and obese people have a higher risk of developing heart disease, hypertension, strokes and type 2 diabetes. An inactive lifestyle is one of the top risk factors for heart disease, but it is one that is remedied by taking exercise.

Regular exercise can strengthen the heart and improve the circulation so the body uses oxygen more efficiently. Lungs benefit from increased capacity as aerobic exercise makes the lungs work harder. The result is greater lung efficiency, which improves stamina and overall health. Exercise also has the advantage of increasing energy and endurance and helping to lower blood pressure. When exercising, the heart muscle contracts more often and more powerfully, so it increases in size and strength. Cardiac (heart) output increases, so more blood is pumped out to the body by the heart. As a result, the individual who exercises regularly will generally have a lower resting heart rate than those who do not, with a quicker recovery time from exercise. Exercise can help to prevent certain diseases such as bowel cancer as exercise can speed the path of food through the colon, so preventing constipation. Regular exercise coupled with a balanced diet is an important factor in maintaining good health.

- 2 An end-of-life care plan is a written plan that sets out an individual's preferences, wishes, beliefs and values regarding their future care in circumstances where they are likely to be near death. The plan gives them the chance to express their wishes about where they would like to receive care (say, at home or in a hospice rather than in hospital) and where they would like to

die. It can contain an advanced decision (so if their condition deteriorates they have already recorded their choices) or living will in case the individual cannot communicate their wishes if they become too ill. They can document that they wish to refuse a certain type of treatment in the future. For example, they may wish to refuse chemotherapy in favour of quality of life, or have a 'Do not resuscitate' instruction on their plan. Having this kind of care plan can empower the individual so that their wishes will be respected, help to guide professionals working with them, and take away difficult decisions from their family.

The plan may include power of attorney. This is a legal document which gives someone the authority to act on behalf of another person. For example, if a parent's mind is deteriorating through dementia and they recognise that they will not be able to make decisions in the future, they may appoint their daughter/son as their spokesperson who will make decisions for and about them. They know the family member will act in their best interests.

- 3 a Samadara consumes just over 41 units each week – well over the recommended limit of 14 units.

- b The liver has many functions that are essential to health, such as:

- ▶ breaking down drugs, alcohol and other potentially toxic substances
- ▶ producing bile to aid with the digestion of fats
- ▶ storing nutrients like glucose in the form of glycogen, as well as certain types of vitamins
- ▶ making proteins that are important for blood clotting.

Various substances can damage the liver. While liver tissue can regenerate, continued damage such as constantly having to break down alcohol can lead to the build-up of scar tissue. This is because the liver cells die and do not have the chance to regrow. As scar tissue forms, it replaces healthy liver tissue. This can impair the liver's ability to carry out its vital functions. Alcohol consumption is one of the leading causes of liver damage.

When liver damage has happened due to alcohol, it is called alcohol-related liver disease (ARLD).

Alcohol-related liver disease does not cause any symptoms until the liver has been severely damaged. There are three stages of ARLD:

- ▶ Alcoholic fatty liver disease – this is when drinking large amounts of alcohol, even for a few days, can result in fatty deposits in the liver.
- ▶ Alcoholic hepatitis – this is when the liver has been abused by drinking large amounts of alcohol over a longer period of time.

- ▶ Cirrhosis – this is when the liver cells have died off and been replaced by extensive scar tissue and is the sign of long-term abuse.

- 4 This was not the right approach to take with Will. Mandi should have worked with him to produce a personalised care and support plan following an initial holistic assessment about the person's health and wellbeing needs. The individual is central to the process. The person, or their family, works hand in hand with their health and social care professionals to complete this assessment, which then leads to producing an agreed personalised care and support plan with people who use the services. When drawing up bespoke treatment plans, the healthcare professional must consider:

- ▶ empowerment and power
- ▶ the person as an individual
- ▶ respecting the individual's values and preferences
- ▶ choice and autonomy
- ▶ respect and dignity
- ▶ empathy and compassion.

- 5 Aadesh should consider any three of the following:

- ▶ Heart rate – the heart rate is normally 60–100 times a minute. However, when an individual is ill or fighting off an infection, the heart rate speeds up to help the circulation of oxygen and immune cells to help fight off the infection. Bacteria or infection that causes a disease and is accompanied by fever causes the heart rate to rise.
- ▶ Respiratory rate – the usual breathing rate for an adult is 12–20 breaths per minute but infections increase the rate. Breathing should be silent and easy, with the patient not working to breathe. Fast breathing is a sign that the patient has an infection such as pneumonia, or heart failure or blood loss.
- ▶ Blood pressure – normal blood pressure for adults is in the range of 110/60 to 120/80. High blood pressure is defined as 140+ while low blood pressure is below 100. Blood pressure is often raised when a patient suffers from dehydration because of fever.
- ▶ Level of consciousness – patients can be alert with eyes open or confused with eyes open. As well as verbal responses if they can, patients can respond to voice or pain stimulus, for example, pinching a toe or finger or shining a torch in the eyes. They are said to be unresponsive if there is no response to voice or pain, which could indicate a coma.
- ▶ Oxygen saturation – normal oxygen saturation is at least 90 per cent, with 94–100 per cent regarded as normal, so if saturation levels fall it could indicate that the lungs are not functioning efficiently and may be filling with fluid. There could also be excess carbon dioxide as the lungs become inefficient at expelling it.

- ▶ Temperature – an adult's average temperature is 36–37°C. A higher temperature than this is called a fever or hyperthermia. Below 35°C is called hypothermia. Coupled with an increased pulse and breathing, the fever is a sign of the body trying to fight off an infection. High fevers can damage the liver, kidney or other organs and can even cause death.

- 6 There are many different aids available to help individuals feed themselves. These include different types of cutlery, plates, bowls, trays and drinking aids. Perhaps the simplest assistive aid is a drinking straw which allows the individual to drink without lifting the cup or glass. This would be useful for someone with a tremor or a poor grip. Individuals with arthritis of the hand, which can cause poor grip, can have cutlery with thick handles. Plates with rubber bases to stop the plate slipping are useful for individuals who may have the use of only one hand. Two-handled mugs with a lid are useful as there is less likelihood of the individual spilling their drink and they have the security of being able to use both hands to hold it. These assistive aids promote independence and self-confidence as well as safer eating.

The important issue is to let individuals choose which assistive aids they would like to use. In terms of mental health, the health professional may be able to signpost Sara to support groups for stroke patients who can sympathise with her and offer mutual support for her and her family and friends.

- 7 Diet can have a real effect on the heart and blood pressure. The healthier an individual's eating habits are, the more moderate their blood pressure is likely to be (assuming no other relevant health conditions). If an individual does have high blood pressure, it is even more important to make healthy changes to their diet. For some individuals, following blood pressure-friendly eating habits may help them to avoid medicines altogether. Blood pressure can rise if an individual's diet contains too much salt. If the blood pressure remains high, over time there is a risk of the individual having a stroke. Mark could also start to take regular exercise, which will also lower his blood pressure.
- 8 According to the plan, problems with ill health can be avoided by tackling health inequalities and by encouraging individuals to review their lifestyle choices. The NHS Long Term Plan sets out these health inequalities as:
- ▶ poor living environment
 - ▶ poverty

- ▶ lack of life chances
- ▶ poor educational opportunities.

These health inequalities, apart from the obvious negative impact on individuals, ultimately cost the NHS more because there is greater use of hospitals by people in deprived areas due to increased need. For example, people who live in poor housing which is difficult to heat in winter are most at risk of respiratory illnesses. Furthermore, if they have poor educational opportunities, they may be on the minimum wage or be unemployed and find it difficult to cover their expenses. The NHS intends to address these inequalities and make sure that everyone has the best start in life by providing continuity of care through pregnancy to birth and beyond.

- 9 Forgetfulness is a common complaint among older adults. As people age, they experience physiological changes that can cause slowness in brain function. It takes longer to learn and recall information. People often mistake this slowing of the mental processes for true memory loss. Many mental abilities are unaffected by normal ageing. If an individual continues to make an effort to learn new things and engage in cognitive activities, this can minimise ageing effects on cognitive health.

The causes of age-related memory loss are:

- ▶ the hippocampus, a region of the brain involved in the formation and retrieval of memories, often deteriorates with age
- ▶ hormones and proteins that protect and repair brain cells and stimulate neural growth also decline with age
- ▶ older people often experience decreased blood flow to the brain, which can impair memory and lead to changes in cognitive skills.

- 10 If an individual is not eating, the best way to deal with it is to ask them what the issue is and then try to resolve it. There are many barriers to eating that could be the cause. It may be that they are having medication or a treatment which makes them feel nauseous so they do not want to eat or they have lost their appetite. The medication could also cause constipation so they feel too bloated to eat. They may have a sore mouth or problems with their teeth so it is painful when anything is in their mouth. Lacking taste and smell can also cause a barrier as often the smell of food will make the mouth water and start the flow of gastric juices. You could also remind Emily that she needs to eat her meals so she can recover and be discharged, which may help with motivation to persevere.

A10: Infection prevention and control in health specific settings

Test yourself

A10.1

- 1 Clinical waste should be separated into different containers for disposal which indicate how hazardous or infectious it might be. A colour-coding system has been developed to indicate to everyone dealing with the waste just what is in each container and how they need to be disposed of to prevent the possibility of the spread of infection either to the people handling the waste or to the environment. For example, if highly infectious waste were to be sent to a landfill site instead of to an incinerator, the material could leak into the water table, polluting rivers and sewers and possibly causing disease, for example. For the safety of everybody who will handle the waste after it has left the clinical area, it is important for the person disposing of the waste to put it in the correct container. This avoids accidental infection such as being injected by used needles, which could have very serious health implications.
- 2 Any two from:
Disposable gloves are worn when performing or assisting in a procedure that involves a risk of contact with body fluids, broken skin, dirty instruments and harmful substances such as chemicals and disinfectants. This includes procedures that involve:
 - ▶ a risk of being splashed by body fluids (blood, saliva, sputum, vomit, urine or faeces, for instance)
 - ▶ contact with the patient's eyes, nose, ears, lips, mouth or genital area, or any instruments that have been in contact with these

- ▶ contact with an open wound or cut
- ▶ handling potentially harmful substances, such as disinfectants.

Aprons are not needed to carry out many normal aspects of day-to-day care with patients, such as helping them to go for short walks, but they will be needed for:

- ▶ performing or assisting in a procedure that might involve splashing of body fluids
- ▶ performing or helping the patient with personal hygiene tasks such as washing
- ▶ carrying out cleaning and tidying tasks in the patient's living space, such as bed-making.

Healthcare workers routinely use face masks as part of their personal protective equipment. However, masks do not protect the wearer from inhaling small particles that can remain airborne for long periods of time. Face masks are effective barriers for retaining large droplets which can be released from the wearer through talking, coughing or sneezing. They are useful in many patient care areas as they may reduce wound site contamination during surgical or dental procedures. But face masks cannot be used as protection from many hazardous airborne materials. Often these face masks are used in conjunction with a face shield.

- 3 Water temperatures of at least 60°C are high enough to kill bacteria and viruses which may be carried by healthcare workers' uniforms.
- 4 Aseptic means free from contamination caused by harmful bacteria, viruses, or other micro-organisms, i.e. surgically sterile or sterilised.
- 5 Any three from:

Moments	When	Why
1 Before patient contact	Always clean your hands before touching a patient.	To protect patient against germs on the healthcare worker's hands.
2 Before a clean/aseptic procedure	Clean hands immediately before any clean/aseptic procedure as this prevents contamination. An aseptic procedure could be a change of dressing or bandage for the patient.	To prevent harmful germs from both healthcare worker and patient entering patient's body if dressing is not kept sterile.
3 After body fluid exposure risk	Clean hands immediately after exposure to body fluids (and after glove removal).	To protect healthcare worker and environment from harmful patient germs.
4 After patient contact	Clean hands when touching a patient and their immediate surroundings and when leaving patient's side.	To protect healthcare worker and environment from harmful patient germs.
5 After contact with patient surroundings	Clean hands after touching any object or furniture in the patient's immediate surroundings when leaving – even if patient has not been touched.	To protect healthcare worker and environment from patient's germs.

A10.2

- 1 The process by which bacteria or other micro-organisms are transferred from one person to another with harmful effect.
- 2 The purpose of handwashing is to remove or destroy any bacteria picked up on the hands. Bacteria and viruses can easily be spread by touch. They may be picked up from contaminated surfaces, objects or people, then passed on to others. Effective hand decontamination – either by washing with soap and water or with an alcohol-based hand-rub – is recognised as crucial in reducing avoidable infection.
- 3 Handwashing with soap and water is effective in removing most microorganisms from the hands and can go a long way towards preventing cross contamination (where food is contaminated by contact with other food) and cross infection (where infection is passed from one person to another, which occurs when microbes are passed between them). This is especially the case in health settings where more harmful organisms might be picked up from infected individuals and passed on to others if hand hygiene is ignored.
- 4 To ensure that the cut stays dry and is able to heal and so that the plaster does not drop off. The cut may contain bacteria which could be passed on to another person or surface so it must be covered.
- 5 Any five from: smallpox, measles, plague, typhoid, anthrax, diphtheria, food poisoning, scarlet fever, tuberculosis, viral hepatitis, tetanus, meningitis, mumps, whooping cough.

A10.3

- 1 Disinfectant is used to reduce the number of micro-organisms on surfaces to a level that is considered safe, but which may not necessarily destroy some viruses or bacterial spores. Disinfection is usually acceptable for items that pose a medium risk of infection if these devices cannot be effectively sterilised.
- 2 Chemical disinfection is not as effective as heat disinfection. Heat disinfectants such as dishwashers, washing machines and washer-disinfectors clean the item and then expose the items to hot water for the required time to achieve thermal disinfection:
 - ▶ 65 °C for 10 minutes
 - ▶ 71 °C for 3 minutes
 - ▶ 80 °C for 1 minute
 - ▶ 90 °C for 1 second.

While most chemical disinfectants are capable of inactivating bacteria and certain types of viruses (those which have an 'envelope', an outer layer), many are not so effective against some viruses – for example, the hepatitis viruses, cysts and bacterial spores.

- 3 Decontamination is a process or combination of processes such as cleaning, disinfecting and sterilising that removes or destroys contaminants so that infectious agents cannot cause infection. As soon as a piece of equipment is contaminated with urine, blood, vomit, etc. it should be removed from service. It must be decontaminated as soon as possible, but best practice is to do it immediately, away from busy areas in the healthcare setting. Decontamination is essential to lower the number of cross infections between people and to prevent healthcare associated infections (HCAIs).
- 4 Sterilising means to kill all microbes and their spores, whether harmful or not, present on a surface or object. This is thus more effective than disinfection. This can be done using steam in machines called autoclaves which use steam heated to 121–134 °C.

A10.4

- 1 There is a national colour-coding scheme for hospital cleaning materials and equipment. All NHS organisations should have adopted this code for cleaning materials. All cleaning items, for example, cloths (reusable and disposable), mops, buckets, aprons and gloves, should be colour coded according to where they are used. This includes those items used to clean catering departments. This scheme ensures that wherever a healthcare worker goes in the country, all NHS hospitals will be following the same colour code.
- 2 Yellow is used for isolation areas.
- 3 Vacuum cleaners should be kept well maintained to minimise dust dispersal, and should be equipped with HEPA (high-efficiency particulate air) filters, especially for use in high-risk patient-care areas. A HEPA filter is a type of filter that can trap tiny particles that other vacuum cleaners would simply recirculate back into the air. HEPA vacuums are recommended for minimising dust and other common allergens.
- 4 Any three from:
 - ▶ application of chemical
 - ▶ application of high pressure
 - ▶ application of heat
 - ▶ application of irradiation and filtration.

- 5 Irradiation is the process of exposing surfaces and objects to different types of radiation for sterilisation. Mainly electromagnetic radiation, such as ultraviolet light, microwaves, X-rays and gamma rays, is used for this purpose. Both X-rays and gamma rays can be used for the sterilisation of medical equipment such as syringes, needles, cannulas. Microwaves can be used for the sterilisation of any medical instruments that do not melt. Ultra-violet light is usually used to sterilise patient rooms as well as operating theatres. If delivered at appropriate levels, all forms of ionising radiation can sterilise objects, including medical instruments. Irradiation works by disrupting the bacterial DNA of the microorganisms, preventing bacterial division.

Assessment practice

- 1 It is not a good idea for Bharti to visit her partner as he will be vulnerable to infections because of his heart surgery. Bharti could pass on her diarrhoea and sickness to the whole ward, which could cause a serious outbreak as Bharti could have norovirus, which is highly contagious. What may be a minor ailment in a healthy person could kill a vulnerable person. Bharti should stay away until she is completely better.
- 2 NICE, in collaboration with Public Health England (PHE), has developed clinical syndrome-specific guidance and advice, which offer evidence-based antimicrobial prescribing information for all care settings to help slow the development of antimicrobial resistances. This is part of an approach it is promoting across the whole healthcare system and related organisations of antimicrobial stewardship, to ensure they continue to have some effectiveness in future. Under this, clear guidelines are offered to prescribers on whether they should prescribe antibiotics or not. For example, that they should:
 - ▶ only prescribe antibiotics in line with NICE antimicrobial guidelines
 - ▶ ensure medicines prescribed are clinically effective and cost-effective.

So Vinnie should not be prescribed antibiotics as he has just had two lots and they will become ineffective for him.
- 3 The best way of preventing infection spreading in the home or anywhere is to keep the hands clean by washing frequently with warm water and soap. The hands can pass on an infection and can pick up germs from one place and transfer them to another. The importance of this basic step should not be underestimated and should become part of everyone's routine.

The purpose of handwashing is to remove or destroy any bacteria picked up on the hands. Bacteria and viruses can easily be spread by touch. They may be picked up from contaminated surfaces, objects or people, then passed on to others. Effective hand decontamination – either by washing with soap and water or with an alcohol-based hand-rub – is recognised as crucial in reducing avoidable infection.
- 4 Any two from:
 - ▶ MRSA (full name methicillin-resistant *Staphylococcus aureus*)
 - ▶ *Clostridium difficile* (also known as *C. difficile* or *C. diff.*)
 - ▶ NDM-1
 - ▶ *Klebsiella pneumoniae*.
- 5 Any three from:
 - ▶ Regular washing or showering will help prevent build-up of dirt and sweat. Extra care must be taken where sweat is trapped in folds of skin.
 - ▶ The healthcare worker should wear a clean uniform every day in their place of work.
 - ▶ Clean teeth mean healthy teeth and less chance of bad breath. Teeth should be brushed at least twice a day – in the morning and before going to bed. Particular attention should be paid to the gumline as individuals often forget to brush their gums as well as their teeth. Anti-bacterial mouthwash can help to maintain oral hygiene. A visit to the dentist every six months is recommended to ensure any problems are spotted early.
 - ▶ Covering the mouth and nose when coughing and sneezing helps reduce the spread of germs. Flu and other infections are spread through microscopic water droplets expelled from an infected person, commonly through coughing, sneezing and hand-to-mouth contact.
 - ▶ Healthcare workers should have short, clean nails as dirt and bacteria can easily become trapped under long nails and contribute to the spread of illness and infection. Long nails are also more likely to snag or damage gloves worn as part of PPE.

- Dirty hair can spread infection, particularly if it is loose and hanging around the face. Tying hair back, where it is long enough, is essential in health and social care as it can contain bacteria which could cause infection. Furthermore, cross infection (transferring infections from one place to another) could occur if the hair is allowed to trail in body fluids when a healthcare worker is cleaning up a patient or serving food on the ward. Besides this, long hair which is not tied back may get in the way during many tasks, risking getting caught or impairing the healthcare worker's vision.

- 6 a** The Health and Safety at Work Act 1974 places responsibility on both the employer and individual employees to do what is reasonable to adequately control the risks of infection for staff and others. Under this legislation all employees have the responsibility to co-operate with the employer on matters of health and safety and in the context of healthcare, particularly regarding the reduction of risks from healthcare-associated infections (HCAs). Instruction should be given on the use of appropriate PPE as part of this. It is also the employees' responsibility to identify any issues and report them.
- b** The Control of Substances Hazardous to Health (COSHH) Regulations 2002 require employers to prevent or control exposure of employees, patients, visitors, etc. to biological hazardous substances, such as certain microorganisms, at work. In hospitals and residential care homes, risks may arise from the handling of clinical waste and soiled laundry, which can be contaminated with a variety of pathogenic organisms. Such hazards should be identified and assessed under the provisions of COSHH. Procedures for safe handling, segregation, storage, spillage control and disposal should be laid down and staff should be trained accordingly. Staff should be protected against hazardous substances they may use in their work activities, for example, staff in residential care homes and hospitals are particularly at risk from clinical waste, including soiled laundry. Therefore, staff should be trained in safe working procedures and hygiene standards, as well as being provided with appropriate protective equipment.

The requirements of COSHH also affect the use and storage of hazardous materials. It states

that all settings must have a COSHH file, which is kept up to date, listing all the hazardous substances stored on the premises. Hazardous substances used in healthcare settings include some cleaning materials, disinfectants and microorganisms from soiled laundry and clinical waste. All cleaning materials, for example, bleach, should be kept out of reach of vulnerable individuals. This can be achieved by keeping the substances in a locked cupboard when not in use. When working with any hazardous substances the healthcare worker should ensure precautions listed in the COSHH file are followed. Guidance for storage of hazardous substances is also given in the COSHH file.

- c** The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013 are concerned with certain types of injury, occupational ill health and dangerous occurrences which occur within the workplace. This includes serious incidents that involve any individual present, including non-employees, for instance visitors or patients. As well as reporting these the employer has the responsibility of reporting certain notifiable diseases. It is important that such diseases are reported to the relevant medical authorities so that the wider community can be protected.

A11: Safeguarding

Test yourself

A11.2

- 1** Protecting an individual's health, wellbeing and human rights; enabling them to live free from harm, abuse and neglect.
- 2** To safeguard both adults and children from harm and abuse by preventing unsuitable people from working with vulnerable adults and children. This involves:
 - criminal records checks by searching police records and barred list information
 - deciding whether it is appropriate for a person to be placed on or removed from a barred list.

An employer will request a DBS check for roles that may involve working or volunteering in health, social care and childcare settings, or any role involving interaction with children and vulnerable adults.

- 3 Any three from:
- ▶ Always assume a person has capacity unless proven otherwise.
 - ▶ Take all practicable steps to enable people to make their own decisions.
 - ▶ Carefully consider actions to ensure the least restrictive option is taken.
 - ▶ Always act in their best interests for a person without capacity.
 - ▶ Do not assume mental incapacity because of an unwise decision.

- 4 Any two from:

Local authorities should:

- ▶ establish safeguarding adults boards (SABs); these include the NHS, the local authority and the police, who will work together to develop and implement joint safeguarding strategies
- ▶ implement (and lead) a multi-agency local adult safeguarding system that prevents abuse, harm and neglect (but if it does occur will be able to act swiftly to stop it)
- ▶ investigate when they suspect a vulnerable adult may be at risk of abuse, harm or neglect
- ▶ carry out a safeguarding adults review (SAR) when someone with care and support needs dies as a result of neglect, harm or abuse and there is a concern that more could have been done to protect them
- ▶ arrange for an independent advocate to represent and support an individual who is the subject of a safeguarding enquiry or review.

Just as the Amendment to the Mental Capacity Act above emphasises that any decisions must involve the person concerned, and that their wishes, feelings and views must be considered, so too does the Care Act. Any actions taken to support and protect the individual should have a minimum effect on their rights and freedom.

- 5 The rules that order individuals to be looked after were not being followed properly because staff found them too complicated. Also, many individuals who were unable to make decisions for themselves were ordered to be looked after, so their rights were eroded as their wishes and feelings were not being taken into consideration. Under the Amendment, rules should be easier to understand as it changes who decides for people who lack capacity. If the individual is in hospital, the hospital makes the decision. If they are in a care home or their own home or supported accommodation, the local council decides. Otherwise the decision is taken by the NHS Clinical Commissioning Group (CCG).

The Amendment has made it clear that an individual cannot be ordered to be looked after before talking to:

- ▶ the individual
- ▶ someone who can make decisions for the individual by law
- ▶ an independent mental capacity advocate
- ▶ anyone the individual has said can help make a decision for them
- ▶ people who care for the individual, for example, a family member or carer.

A11.4

- 1 Any three from:

- ▶ age
- ▶ individuals with health issues
- ▶ being physically dependent on others
- ▶ lack of mental capacity
- ▶ history of abuse
- ▶ social isolation
- ▶ drug/alcohol abuse
- ▶ finance
- ▶ religion.

- 2 Any three from:

- ▶ children
- ▶ young people
- ▶ elderly people
- ▶ adults receiving care in their home
- ▶ individuals with physical, mental or sensory impairments or learning disabilities
- ▶ people who do not live near friends and family
- ▶ unemployed individuals or low-paid workers
- ▶ people financially dependent on others
- ▶ socioeconomically disadvantaged individuals
- ▶ people from minority ethnic groups.

- 3 FGM, also previously known as female circumcision or cutting, is when a female's external genitals are deliberately removed, cut or injured for non-medical reasons. These may include because of expectations in an individual's cultural, social or religious community to do so, where it may be seen as beneficial for female hygiene or making a woman marriageable.

This practice often takes place between infancy and 15 years of age. It can cause medical complications and discomfort or pain for the individual. It is often performed by someone with no medical training and without anaesthetic or antiseptic treatment. It is illegal in many countries, including the UK, but it is still carried out in certain African, Middle Eastern and Asian countries.

- 4 Any four from:
 - ▶ criminal exploitation
 - ▶ domestic servitude
 - ▶ forced labour
 - ▶ sexual exploitation and other forms such as forced marriage, organ removal
 - ▶ forced begging
 - ▶ illegal adoption.
 - 5 Abuse by people (usually adults) who have power over young people and use it to sexually abuse them. This can involve a broad range of exploitative activity from seemingly 'consensual' relationships and informal exchanges of sex through to serious organised crimes.
 - 6 Bullying can take place anywhere – at school, at work, at the gym, on the sports field, etc. There is no legal definition but it is usually defined as repeated behaviour which is intended to hurt someone either emotionally or physically. It is often aimed at certain individuals because of a perceived difference, which may include their ethnicity, religion, gender, sexual orientation or any other aspect such as appearance or disability.
 - 7 Any practice used by families to control behaviour in order to protect the reputation of the family. Victims are most likely to be female but it can happen to males as well. If an individual is deemed to have brought shame or dishonour to their family by behaviour such as having relationships with friends or partners their family do not approve of, then members of the immediate family will punish that individual, including with violence. Being in a same-sex relationship or becoming pregnant outside of a family-approved marriage may also be causes of such disapproval. Sometimes the extended family and even other members of the community become involved, either directly or by collusion or covering up the abuse. Forced marriage is one form of honour-based abuse.
- A11.7**
- 1 If any disclosures are made to a healthcare worker, they must explain to the individual disclosing abuse that they will have to pass on the information because of the risks posed to that person's health and wellbeing. It is the healthcare worker's duty not to delay reporting disclosures to ensure the individual is protected from any further risk of abuse.
 - 2 Public awareness campaigns can make a big difference. The public has an important role to play in safeguarding children and adults they know or encounter by recognising and helping to prevent abuse. It is the responsibility of all agencies and organisations to ensure that there is a lot of public awareness and understanding of child and adult abuse. Public awareness campaigns are designed to inform and educate the public on what is meant by abuse and the signs and symptoms to look out for. They should also inform people about where to get help and advice.
 - 3 Staff in any setting working with children and vulnerable adults should undertake training courses on safeguarding children and vulnerable adults that provide up-to-date information. This ensures their knowledge and skills remain current and effective. At the time of writing, government guidance states that safeguarding training must be undertaken by staff at least every three years and at least every two years for designated officers. It must be appropriate to the job role (i.e. relevant to the situations they encounter and the scope of their job role) and include an understanding of the possible signs and symptoms of vulnerable child/vulnerable adult abuse, how to respond when abuse is disclosed or suspected, and the latest safeguarding legislation, national and local policies and procedures.
 - 4
 - a When a member of staff speaks up or raises a concern ('makes a disclosure') about working practices which are unethical, dangerous and/or break the law and are in the public interest to disclose. These fall into certain categories and often involve unsafe working practices that may harm individuals in their care. Healthcare professionals may whistleblow if the care is poor or dangerous and the patient may be harmed because of this. This is important because they have a duty to report their concerns.
 - b The Act protects workers from dismissal if they disclose information about malpractice, including abuse at their current workplace, and provides a legal framework for whistleblowing. After investigation, even if they prove to be wrong, if they can show that they believed it to be true, then the Act protects them from losing their job because of this or from being passed over for promotion.
 - 5
 - a This approach sees the person as an individual, focusing on their personal needs, wants, goals and aspirations. The individual becomes central to the healthcare process. The support the individual needs must be designed in partnership with the individual, their family and/or carers.

- b** Any three from:
 - ▶ knowing the person as an individual
 - ▶ empowerment and power
 - ▶ respecting the individual's values and preferences
 - ▶ choice and autonomy
 - ▶ respect and dignity
 - ▶ empathy and compassion.

6 a Agencies such as schools, social services, health services, youth organisations, charities and the police should work alongside one another to protect children, young people and vulnerable adults from abuse and to prevent further harm and abuse.

- b** All agencies involved must understand the role they have to play in safeguarding as well as the roles others have. All professionals must be committed to working alongside other professionals who may work in different agencies and have different roles.

A11.8

- 1** Clinical effectiveness is a key factor in patient safety. It means that information collected from national and international validated and reliable research is used to identify which practices are safe, effective and efficient. In other words, which treatments work and have evidence to verify their success. Drawing all the information together helps healthcare professionals and their patients make decisions about what is best for the patient.
- 2** The patient must be at the centre of any treatment and should be treated as an individual. They must be given safe and clinically excellent care. The patient must feel a valued and equal partner in any discussion about their care; they need to feel in control and should be treated with honesty, respect and dignity. Patient experience is improved when they can make informed choices about their care because they have been given high-quality information to help guide their decision-making. Patients who take part in shared decision-making are more likely to follow advice given by the healthcare professional when they are discharged from hospital. Generally, patients who have better experiences have better health outcomes – for example, they are discharged more quickly from hospital because they have recovered faster from their procedure.
- 3** It helps if the healthcare professional spends more time with the patient to explain all the available options to them. Although this may take more time

at the beginning of the treatment, for the healthcare professional it will be worthwhile when they have an informed patient who is much happier and more likely to have positive outcomes. This will make the patient feel involved in their clinical journey; their self-esteem will be boosted. This will have a positive effect on them, which should aid their recovery.

A11.9

- 1 a** When individuals come to believe and support extreme ideas or doctrine around political, religious or social ideals, especially with regard to the use of violence. It is a form of exploitation involving individuals being influenced and coerced into extremism.
- b** Any two from:
 - ▶ The person may feel lonely or unhappy about themselves or feel they do not fit into their peer group.
 - ▶ They may be bullied or harassed, or feel discriminated against, and are looking for a place to belong and where they feel valued.
 - ▶ They may be dreaming of glory and feel they could save the world if they join a terrorist or extremist group.
- c** Any three from:
 - ▶ detachment from family and friends
 - ▶ raised levels of anger
 - ▶ failure or avoidance of discussing own view
 - ▶ increased interest in privacy or secretive behaviour.
- 2 a** Prevent is a community safeguarding programme about identifying individuals, including children and young people, before they become radicalised. It is about early intervention.
- b** Any two from:
 - ▶ Pursue – to stop terrorist attacks.
 - ▶ Prevent – to stop people being drawn into terrorism.
 - ▶ Protect – to strengthen the UK's protection against terrorism.
 - ▶ Prepare – to lessen the effect of a terrorist attack.

A11.10

- 1 a** To:
 - ▶ protect the public
 - ▶ uphold professional standards
 - ▶ maintain public confidence in the healthcare professions.

- b** Any three from:
 - ▶ Setting standards of competence and conduct for healthcare professionals.
 - ▶ Checking training and education courses are suitable.
 - ▶ Keeping a register of professionals.
 - ▶ Following up complaints about registered professionals.
- c** Types of behaviour that could cause a healthcare professional to be struck off the register include sexual misconduct, criminal offending for serious crimes such as assault or murder, or dishonesty. Dishonesty is not just stealing but also includes covering up when things go wrong and could or did cause harm to a patient. Examples of incompetence could be inadequately exploring a patient's medical history or misinterpreting baseline observations such as oxygen saturation or level of consciousness, or realising they are out of their depth but not asking a colleague for help.
- 2** It is important that everyone has the right to be treated fairly and equally; healthcare workers should respect patients' rights, choices and beliefs. Some attitudes towards and assumptions about patients can create barriers, such as stereotyping or lacking respect for cultural and ethnic differences. Unless a healthcare professional communicates with each person as an individual, they are likely to make assumptions about them based on something they have seen or read, for example, that all older people are weak and frail. The judgement or prejudice may be inaccurate but it could affect the interaction with that person.
- 3** When practitioners communicate effectively, share best practice and work co-operatively with colleagues.
- ▶ arranging repairs for faulty/broken equipment, ordering missing materials
- ▶ clarifying the job role
- ▶ reviewing the workload
- ▶ supervision and support
- ▶ additional training
- ▶ an occupational health referral.
- c** If Janine is still not meeting the standard by Stage 3 of the review, she may be advised to apply for other vacancies within the organisation. These vacancies may be at a lower grade but she will be guaranteed an interview if she meets the minimum requirements. Throughout this unsatisfactory performance management process she will have written confirmation of targets, etc. that have been agreed, so she will know exactly what to do for her work to be considered satisfactory.
- 3 a** A situation where a person of trust or an organisation's own interests are in direct conflict with the interest of the patient. It could also mean the person of trust or the organisation sets to benefit from the patient.
- b** ▶ Be open and honest, acting with integrity. A person acting with integrity is honest and truthful and always follows moral principles. As a public employee, they must be as open as possible about all their decisions and actions. They must also declare any private interests which may relate to their duties as a healthcare worker, and follow workplace guidelines. These will give the healthcare worker a framework for how to report conflicts of interest; they will also say which person has the responsibility for conflicts of interest. Under current guidelines, healthcare staff can accept small gifts up to the value of £50 from patients without declaring them; however, gifts of money or vouchers must always be declined.
- ▶ Declare any personal conflicts (for example, that you have a personal relationship with the individual). If a member of staff does not declare a relationship with a job applicant in the setting they work in, they could be accused of favouritism or giving preferential treatment to one of the candidates, or they could potentially lose their job. There must be transparency in the recruitment process as it is essential in avoiding real or perceived favouritism of friends or relations, and that decisions are made based on facts and not on relationships or connections with the people involved.

Assessment practice

- 1** Any three from: empowerment, prevention, proportionality, protection, partnership, accountability.
- 2 a** Managers should consider the possible causes of the concern, which may be:
 - ▶ inadequate training
 - ▶ the health and wellbeing of the worker
 - ▶ a lack of supervision or support
 - ▶ broken or damaged equipment, missing materials
 - ▶ poor systems, policies and procedures.
- b** Janine must be given the chance to improve so the manager may consider the following help for her:
 - ▶ a coach/mentor
 - ▶ reviewing systems, policies and procedures

- 4 Any evidence from disclosures of abuse must be carefully recorded word for word with as much detail as possible. Concerns should not be passed on verbally without a written record to support them. The reason for this is that verbal statements can be altered, parts conveyed inaccurately and the meaning changed as it is passed on. To help with this, each healthcare setting should have a special form for recording disclosures. Everything that has happened must be recorded as the healthcare worker may need to make a formal statement to the police or the investigating team, for which there must be a detailed account of what was said and how.
- 5 Clinical photography could provide evidence of physical injuries in abuse cases. This could be useful for assessing and evidencing the abused person's condition. Before any clinical photographs are taken, the individual must give their permission and consent. The photographer must ensure confidentiality and security of the photographs as these are medical records which contain sensitive personal information. The photographs must not be used for any other purpose than evidence of physical injuries. Only digital cameras/devices supplied by the health trust should be used. The photographer must ensure that the correct date and time are set. Digital cameras/devices must be carried in a secure bag. Where digital devices such as tablets or smartphones are used, they must be password secure.
- 6 Actions should be proportionate to the risk as being overprotective can disadvantage service users in being able to make their own decisions. This principle states that those responsible for safeguarding should utilise preventative measures or respond to a safeguarding issue and provide the least intrusive response appropriate to the risk presented, not apply a one-size-fits-all response. This ensures that any decision takes the child, young person or adult into account when dealing with abuse. All risks are considered and addressed so that no further harm is done.
- 7 Empowerment is to enable an individual to be in control of their life and able to make their own decisions. To do this, an individual must have access to all the information they need to help them come to a decision. The individual may need help and support from the healthcare worker to weigh up all the facts. It takes the power and control from the healthcare worker and places it where it belongs, with the service user. Individuals should be encouraged to make their own decisions and to be involved as much as possible in making decisions about their own life as they know what they would like. In this way people are empowered and allowed to keep their dignity and self-respect, and they also gain confidence.
- 8 Enables individuals and others who work in and visit healthcare settings to openly raise and discuss any concerns and complaints. To make the policy accessible it should be in different languages, large print and different formats, ensuring everyone who meets can make sense of it. This in turn will help to create an environment of mutual trust and respect, where individuals take an active role in making their own decisions about whether they complain or not. Care workers have a responsibility to support individuals in their care if they wish to make a complaint. Responding promptly to complaints and concerns and ensuring complaints procedures are available in formats that are understood and reinforced will mean individuals will be more likely to raise any concerns in relation to safeguarding vulnerable adults.
- 9 Information collected from national and international validated and reliable research is used to identify which practices are safe, effective and efficient. In other words, which treatments work and have evidence to verify their success. Drawing all the information together helps healthcare professionals and their patients make decisions about what is best for the patient. The promotion of clinical effectiveness in the NHS has been stated as a key priority of the current government. Clinical effectiveness aims to ensure that healthcare practice is based on the best available data. It is a key component for improving patient safety and quality health service delivery. Evidence-based practice, as the name suggests, means that when a healthcare professional makes a treatment decision with their patient, it is based on their clinical expertise, sound research and the patient's preferences.
- 10 a Any four from:
 - ▶ Working together for patients – this requires all healthcare staff to put patients first. Patients, their families, carers, etc. must be fully involved in the care offered. If staff are unhappy about anything, they are expected to speak up.
 - ▶ Respect and dignity – every person is an individual. They should be valued and their needs addressed. They should have a voice, be listened to and be taken seriously.

- ▶ Everyone counts – nobody must be discriminated against or excluded. Available resources must be used wisely for the benefit of the whole community.
 - ▶ Commitment to quality – patients must have quality of care; their treatment should be effective and safe. Feedback from patients should be encouraged and acted on to improve the care.
 - ▶ Compassion – anxiety, pain and distress must be met with kindness, care and compassion. Staff must provide comfort and support to help relieve any patient from suffering.
 - ▶ Improving lives – people's health and wellbeing can be improved by clinical excellence, professionalism, innovative practice and service improvements.
- b** Every NHS trust will use the six core values for their own behavioural framework. They may alter or change the words but the principles behind their policies will remain the same. These values will be used in staff appraisal discussions/performance management as well as forming the basis of any feedback or discussion on everyday practice. Students applying for university courses in healthcare are tested on these values.

B1: Core science concepts

Test yourself

B1.5

- 1 Magnification is how much bigger the image is than the object. Resolution is the smallest distance between two points that can be seen as separate.
- 2 So that light can pass through the sample.
- 3 $1.5 \text{ mm} = 1500 \mu\text{m}$, $1500 \div 7.5 = \times 200$
- 4 $10 \text{ mm} = 10\,000 \mu\text{m}$, $10\,000 \div 400 = 25 \mu\text{m}$

B1.7

- 1 All living things are made up of one or more cells. Cells are the most basic unit of structure and function in all living things. All cells are created by pre-existing cells.
- 2
 - a Interphase
 - b Metaphase
 - c Prophase
 - d Telophase
- 3 Because DNA is replicated in interphase and this is necessary to form two chromatids that can be separated in mitosis.

B1.8

- 1 Glycosidic bond.
- 2 Amino acids and monosaccharides.
- 3 Primary structure is the sequence of amino acids; secondary structure is the way parts of the polypeptide chain are folded; tertiary structure is the three-dimensional shape of the protein; quaternary structure is when two or more polypeptide chains form a functional protein.
- 4 Fatty acids and glycerol.
- 5 A phospholipid is formed when one of the fatty acids in a triglyceride is substituted by a phosphate-containing group.

B1.11

- 1 Large multicellular organisms require specialised exchange and transport mechanisms because they have a low SA:Vol ratio so cannot rely on simple diffusion for exchange. This means they need a specialised exchange organ. By having a specialised exchange organ, they need a transport mechanism to take substances between the exchange organ and the tissues.
- 2 Large surface area, short diffusion pathway, maintenance of high concentration gradient
- 3 Phospholipids are arranged in a bilayer with their hydrophobic tails on the inside and hydrophilic heads on the outside. Proteins are attached to or embedded in the membrane and are able to move within the membrane.
- 4 Polar molecules require special transport mechanisms to cross cell membranes because they cannot move into the phospholipid bilayer and so cannot move across the membrane by simple diffusion.
- 5 Active transport requires ATP or a source of energy and move substances against a concentration gradient.

B1.13

- 1 A sequence of DNA that codes for a polypeptide
- 2 DNA has deoxyribose, RNA has ribose; DNA has T, RNA has U; DNA is double stranded, RNA is single stranded; DNA is very long, RNA is relatively short.
- 3 Hydrogen bonding between A – T and G – C.

B1.15

- 1 **A** Disease-causing microorganism.
- 2
 - a Eukaryote
 - b Prokaryote
 - c Eukaryote

B1.22

- 1
 - a Any two from: tuberculosis, cholera, food poisoning, chlamydia, gonorrhoea.
 - b Any two from: flu, common cold, mumps, measles, SARS, COVID-19.
- 2 A pathogen is a disease-causing microorganism; a vector is the organism that transfers the pathogen from host to host.
- 3
 - a Any two from: direct contact with an infected person or surface; sharing of needles; unprotected sexual contact.
 - b Droplet infection, dust particles.
 - c Any two from: eating contaminated food or water; contact with infected bodily fluids on inanimate objects; being bitten by an insect vector.
- 4 Poor sanitation or overcrowding.
- 5 A protein or glycoprotein on the surface of a cell that allows the immune system to recognise the cell as self or non-self.
- 6 Specific response is slower and different for each type of pathogen.
- 7 Primary immune response is slower/produces fewer antibodies; secondary immune response involves memory cells.

B1.23

- 1 The inflammatory response and the proliferation phase.
- 2 They remove dead or damaged body cells.
- 3 There is increased blood flow to the site of injury during the inflammatory response. Formation of a blood clot helps to seal the wound to prevent entry of pathogens. This also helps to bind the edges of the wound together and form scar tissue.
- 4 Any two from:
 - ▶ reduction in blood pressure after injury
 - ▶ excessive bleeding
 - ▶ severe allergic reactions
 - ▶ infection of the blood.

B1.25

- 1 The study and analysis of the distribution and patterns of disease in populations and why they occur. It also covers the application of this study and analysis to the control of health problems.
- 2
 - a Incidence is the rate at which new cases of disease occur; prevalence is the proportion of a population affected by the disease at a particular time.
 - b Morbidity describes illness or ill health; mortality means death caused by a particular disease.

B1.26

- 1 Identify trends and patterns in the data and how the disease spreads. This can help with identifying the cause of the disease and how it can be prevented.
- 2 Because it can help prevent the incidence of disease which will decrease the overall prevalence, rather than just treating it when it occurs.

B1.27

- 1 They increase awareness in the general population and help people to reduce their risk of disease.
- 2 Any two from:
 - ▶ restricting access to drugs of abuse
 - ▶ restricting sale of certain goods based on age
 - ▶ restricting movement of people.

B1.28

- 1 Because homeostasis maintains blood glucose, temperature, water content of the body within a narrow range/there are small fluctuations around the normal level.
- 2 The endocrine system and the nervous system
- 3
 - a Because enzymes are adapted to work best at body temperature.
 - b To prevent damage to cells due to movement of water by osmosis.
 - c Because cells need a constant supply of glucose to carry out aerobic respiration supplying ATP for energy.

B1.29

- 1
 - a She has blood pressure and resting heart rate in the normal range, but her resting respiration rate is high.
 - b This is most likely within the normal range as resting heart rate in children is higher than in adults.
 - c Both his resting heart rate and blood pressure are above the normal range.
 - d Although her resting heart rate is below the normal range, this is not unusual in trained athletes and is not a cause for concern. Her blood pressure is within the normal range.
- 2 Increase in blood pressure leading to increased risk of cardiovascular disease and increased risk of type 2 diabetes.

B1.32

- 1 Gamma radiation is a form of electromagnetic radiation; alpha and beta radiation both consist of particles.

- 2 10 years = 4 half-lives, so remaining activity will be
 $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times 500\,000 = \frac{1}{16} \times 500\,000 = 31\,250 \text{ Bq}$

B1.35

- 1 a Kilogram (kg)
 b Metre (m)

2

Convert from	Convert to	Answer
1250 mm	m	1.25 m
0.0005 kg	g	0.5 g

- 3 a 1.26×10^6
 b 1.35×10^{-7}

Assessment practice

- 1 a **D** Rough endoplasmic reticulum.
 b A phospholipid bilayer in which proteins are embedded like tiles in a mosaic and are free to move around.
- 2 **D** Proteins, polysaccharides and lipids are all formed by condensation reactions.
- 3 a The DNA is replicated to produce chromosomes consisting of two chromatids. The chromatids separate and each daughter cell has an exact copy of the DNA of the parent cell.
 b Prophase, metaphase, anaphase, telophase.
- 4 $11.3 \text{ mm} = 11\,300 \mu\text{m}$, so magnification = $11\,300 \div 1.5 = \times 7533$
- 5 a Because malaria is caused by a eukaryotic parasite.
 b Because insecticides kill the mosquito vector that transfers the malaria parasite into humans.
- 6 Both slogans were short and easily memorable. The first was used during lockdown to encourage compliance with the restrictions. The second focused on hand hygiene, face coverings and social distancing.

However, the first slogan did not contain an education message, whereas the second one encouraged safe behaviour. Also, the second slogan only makes sense if you have had a fuller explanation. Slogans can reinforce a message, but they need to be used in conjunction with an education element.

- 7 Vaccines stimulate antibody production, however longer-term protection against infection relies on memory cells. Antibody concentrations could fall, but if memory cells are present, they will lead to a rapid secondary response on exposure to the

pathogen. Also, antibody concentrations do not indicate the level of cell-mediated immunity.

- 8 Source A is an alpha emitter because it has low penetration/cannot pass through the wall of the bottle. Source B is a beta emitter because most of the radiation is absorbed by the aluminium and beta radiation has medium penetration. However, source B is also a gamma emitter as some of the radiation passes through the aluminium so it has high penetration but is absorbed by the lead.
- 9 **C** Morbidity describes the state of ill health and mortality means death caused by a disease.
- 10 a Patient A had suffered injury because a broken arm is unlikely to be life threatening or life changing. Patient B may have suffered trauma because they were unconscious with low blood pressure, and a swollen abdomen might indicate severe internal injury/involuntary inflammatory response.
 b Patient B was given intravenous fluids to increase their blood pressure and kept warm because they might be ischaemic/in shock. The MRI scan would help identify any internal injury and indicate whether urgent surgery was needed.
 c Remove any external metal objects and try to find out (as far as possible with an unconscious patient) if they have any metal implants.

B2: Further science concepts in health

Test yourself

B2.1

- 1 Fibrous joints are fixed, cartilaginous joints allow limited movement and synovial joints allow a greater degree of movement.
- 2 Any three from: long, short, flat, irregular, sesamoid.
- 3 They both consist of collagen, ligaments connect bones together whereas tendons connect muscles to bones.
- 4 a Myosin b Actin

B2.7

- 1 a They all have endothelial cells – arteries and veins are lined with endothelial cells, capillaries consist of a single layer of endothelial cells.
 b Arteries have a smaller lumen than veins; arteries have thicker layers of muscle/elastic tissue.

- 2 Blood enters the right atrium and passes through the tricuspid valve into the right atrium. It then passes via the semi-lunar valves into the pulmonary artery to the lungs. It returns from the lungs via the pulmonary vein to the left atrium. It flows through the bicuspid valve into the left ventricle. From there it passes into the aorta via the semi-lunar valves.
- 3 Because the blood passes through the heart twice for every full circuit of the body.
- 4
 - a The SAN acts as a pacemaker generating electrical signals that spread over the atria, stimulating contraction; there is no outside stimulation of the SAN, it happens automatically.
 - b Electrical activity generated by the SAN reaches the AVN. After a short delay, the AVN sends electrical impulses via the bundle of His that stimulates the ventricles to contract from the base up towards the valves.

B2.9

- 1 The diaphragm and the intercostal muscles.
- 2 The alveoli walls are a single layer of cells so there is a short diffusion pathway; many alveoli means that there is a very large surface area for diffusion; ventilation of the lungs (breathing) maintains a high concentration of oxygen and low concentration of carbon dioxide in the alveoli.
- 3 Pulmonary surfactant acts like a detergent reducing the surface tension of water coating the surface of the epithelial cells. This makes it easier to inflate the lungs and also stops the surfaces of the alveoli sticking together.
- 4 Because breathing out at rest involves relaxation (of external intercostals and diaphragm) and recoil (of elastic tissue) whereas forced expiration also involves contraction of internal intercostal muscles.

B2.12

- 1 Oesophagus, stomach, small and large intestines.
- 2 Mucosa, submucosa, muscularis and serosa.
- 3 The mouth and the stomach.
- 4
 - a In the mouth; converts starch to maltose.
 - b In the small intestine; converts lactose to glucose and galactose.
 - c In the stomach; converts proteins into smaller fragments (peptides).
- 5 In the epithelial cells in the ileum.

B2.15

- 1 Ovaries and uterus in females, testes in males
- 2 Because only specific target cells will have the correct receptors for that hormone.
- 3 Insulin and glucagon.
- 4
 - a The hypothalamus/posterior pituitary.
 - b The kidney/nephron/collecting duct.
 - c It reduces water loss in the urine/increases water reabsorption.

B2.19

- 1
 - a Sensory neurones carry impulses from receptors to the central nervous system.
 - b Motor neurones carry impulses from the central nervous system (CNS) to effectors like muscles or glands.
- 2 The myelin sheath consists of Schwann cells wrapped around the axon to insulate it. Gaps in the myelin sheath called nodes of Ranvier allow the nerve impulse to jump from one gap to the next, speeding up transmission.
- 3 Transmission along the nerve cells is an electrical signal whereas transmission between nerve cells uses chemicals/neurotransmitters.

B2.22

- 1 High pressure in the capillaries of the glomerulus forces fluid out of the blood and into the lumen of Bowman's capsule. Red blood cells and large proteins remain in the blood.
- 2 Ions are pumped out of the ascending limb and diffuse into the descending limb. This increases the concentration of ions towards the bottom of the loop. This means that the water potential is lowest towards the bottom of the medulla. As urine passes along the collecting duct it is always in contact with medulla that has a lower water potential, so water can move out of the collecting duct by osmosis.
- 3 When the water potential of the blood falls, the pituitary responds by releasing more ADH. ADH increases the permeability of the collecting duct so that more water can be reabsorbed by osmosis. This means the water potential of the blood will increase.
- 4 Diabetes, hypertension and kidney inflammation.
- 5 It replaces the function of the kidney by removing toxic urea from the blood and maintaining the correct levels of minerals.

B2.24

- 1 It helps to waterproof the skin and forms hair/nails.
- 2 Sweat helps to control body temperature by cooling the body and also excreting inorganic ions and urea.
- 3 Because vitamin D is produced in the skin when it is exposed to sunlight. As there is less exposure to sunlight in colder climates, vitamin D deficiency can develop.

B2.27

- 1 Male and female gametes are formed and then fuse in the process of fertilisation to form a zygote. The zygote develops into the embryo and then the foetus.
- 2
 - a They collect the egg released by the ovary and convey it to the uterus. Fertilisation also occurs in the fallopian tubes.
 - b The ring of muscle acts as a barrier to the uterus and is contracted during pregnancy to protect the foetus. During childbirth, the cervix dilates to allow passage of the baby into the birth canal.
 - c It receives sperm, forms the birth canal and allows loss of menstrual blood.
- 3 Sperm is produced in the testes and carried along the vas deferens. Seminal fluid is added from the seminal vesicles and prostate fluid is added from the prostate gland before the semen is ejaculated via the urethra.
- 4 To produce egg cells and to protect and nourish the developing foetus.
- 5
 - a FSH stimulates growth of the follicle in the ovary.
 - b The surge in LH causes ovulation.
- 6 Menstruation is bleeding from the vagina caused by breakdown of the lining of the uterus.
- 7 Menstruation is triggered by the fall in levels of progesterone and oestrogen around day 28 of the cycle.

Assessment practice

- 1
 - a Contracted muscle, because the thick and thin filaments are (fully) overlapping.
 - b Mitochondria are the site of ATP production, and ATP is required to break cross-bridges between actin and myosin/return the myosin head to its original shape. Without sufficient ATP, the sarcomeres cannot shorten properly and muscle contraction is impaired.
- 2 Gastrin is produced by cells in the stomach and its main target is also the stomach, where it stimulates release of hydrochloric acid. Gastrin

also stimulates secretion of digestive enzymes by the stomach, as well as stimulating release of fluids from the pancreas that are involved in digestion. These are examples of chemical digestion. Gastrin also stimulates contraction of stomach muscles, which helps mix the food with acid and digestive enzymes. This is an example of physical digestion.

- 3
 - a The concentrations of glucose, urea and mineral ions are the same in both because they can all pass into the filtrate. The concentration of proteins is much lower in the filtrate, because large proteins cannot pass into the filtrate and remain in the blood.
 - b Glucose is reabsorbed in the nephron and so does not appear in the urine.
 - c ADH increases the permeability of the collecting duct to water by increasing aquaporins in the epithelial cell-surface membrane. When the water content of the blood falls, the pituitary releases more ADH, and so more water is reabsorbed by osmosis. This increases the concentration of urea in the urine. When the water content of the blood rises, the pituitary releases less ADH, and so less water is reabsorbed by osmosis and the concentration of urea falls. Urea is not reabsorbed in the nephron.
 - d Because in the absence of insulin, the concentration of glucose in the blood rises to such a high level that it cannot all be reabsorbed by the kidneys.
- 4 The most important action is for the patient to stop smoking, as this can prevent the disease progressing. Short-acting bronchodilator/reliever inhalers can be used to treat the symptoms, or long-acting inhalers can be used if these are not effective. Inhaled steroids can be used if bronchodilators are not effective, and oral steroids can be given for short periods if absolutely necessary. Pulmonary rehabilitation can be given to provide a course of exercise, as well as educating the patient and providing dietary advice.
- 5
 - a Adrenaline is released from the adrenal medulla and travels in the blood to the heart. It binds to receptors on the cells in the SAN, increasing the rate at which it generates electrical impulses. This increases the rate at which the atria and ventricles contract, increasing the heart rate and so pumping more blood around the body. This increases the delivery of glucose and oxygen to the muscles, so that they can produce more ATP, allowing them to contract more strongly and for longer in case of having to fight or run away.

- b** The nervous system responds more quickly than the endocrine system. Therefore, the sympathetic nervous system will increase heart rate immediately. Adrenaline will maintain the increased heart rate but will also act on the liver and muscles to prepare the body for fight or flight.
- 6** Both responses involve inflammation. This increases blood flow to the site of injury or infection. As a result, more lymphocytes are available to fight pathogens and, in injury, to remove dead or damaged cells.
- 7** The symptoms of chronic disease can be treated but the disease cannot be cured. This can affect a patient's mental health. Talking therapies can support a patient's mental health by helping them to come to terms with living with the disease. They can also help a patient to change their behaviour in order to manage their symptoms.
- 8** Partial mastectomy/lumpectomy/conservative surgery can be performed, provided there has been no spread to adjacent tissues/lymph nodes.

Chemotherapy/radiotherapy can be used to kill any remaining cancer cells.

Tumours that are dependent on hormones for growth can be treated with oestrogen blockers/tamoxifen.

Monoclonal antibodies can be used for more advanced cancer.

- 9 a** FSH stimulates development of the follicle that produces oestrogen and oestrogen inhibits production of FSH. LH stimulates ovulation and development of the corpus luteum, which releases progesterone that inhibits release of LH.
- b** Because endometriosis is caused by growth of endometrial cells/cells like the lining of the uterus in other parts of the abdomen, and these bleed each period causing inflammation/scarring.
- 10 a** They are exocrine glands/play a part in excretion because sweat contains inorganic ions and urea.
- b** Emollients/moisturisers help to soften dry, irritated skin, and products such as soap can cause irritation that makes symptoms worse. However, these are not enough to control more severe symptoms that require corticosteroids to reduce inflammation, but these can have side effects such as thinning of the skin.