



BIOMEDICAL SCIENTIST



Details of standard

Occupation summary

This occupation is found in the health and care sector. Biomedical scientists are mainly found working in hospitals, but they may also be found working in other healthcare settings including primary care and in public health. Biomedical scientists may also be employed in industry working in laboratory and research facilities and there maybe opportunity for employment in higher education.

This occupation is regulated by the Health and Care Professions Council and biomedical scientist is a protected title. Upon successful completion of the apprenticeship, including the HCPC approved degree or the HCPC approved Certificate of Competence delivered by the IBMS, the apprentice will be eligible to apply for registration with the HCPC as a biomedical scientist. Biomedical scientists can apply to be members of a professional body eg the Institute of Biomedical Science.

The broad purpose of the occupation is to carry out a range of laboratory and scientific tests to support the diagnosis and treatment of disease. Biomedical scientists investigate a range of medical conditions, including for example cancer, diabetes, blood disorders (eg anaemia), meningitis and hepatitis. Biomedical scientists perform a key role in screening for hereditary and acquired diseases, identifying those caused by bacteria and viruses and monitoring the effects of medication and other treatments. Biomedical scientists must be able to work with computers, sophisticated automated equipment, microscopes and other hi-tech laboratory equipment and to use a wide range of complex modern techniques in their day-to-day work. Biomedical scientists usually specialise in one of three broad discipline areas. These are infection sciences, blood sciences or cellular sciences.

In their daily work, an employee in this occupation interacts with

- patients, service users and carers
- other healthcare scientists and other members of the healthcare science team, for example laboratory assistants
- healthcare professionals, for example allied health professionals, doctors, nurses and healthcare support workers
- administration, management and other non-clinical staff, such as porters, cleaners and receptionists

An employee in this occupation will be responsible for using a range of scientific tools, equipment and techniques to carry out a range of tests, investigations and procedures, playing a critical role in supporting the healthcare team in the diagnosis and treatment of human disease. Biomedical scientists must work

with a high degree of accuracy and must be able to follow standard operating procedures, protocols and policies consistently to ensure the quality of the techniques they use.

Biomedical scientists are responsible for the safe use and day to day maintenance of the laboratory tools and equipment they use. Biomedical scientists are required to communicate effectively, in an easy to understand manner, with patients, carers and other healthcare professionals. Biomedical scientists may provide professional leadership in their area of practice. They may supervise the work of others, for example laboratory assistants, and can delegate certain tasks to their wider team under supervision. They are responsible for maintaining their knowledge and skills and must maintain registration with the Health and Care Professions Council. They may contribute to the development of others. Biomedical scientists are able to apply the principles of evidence-based practice to their decision making, using research other sources of evidence to improve the quality of their practice.

Typical job titles include:

Biomedical scientist

Entry requirements

Entrants will typically have completed either A-levels, including at least one science A-level, or the L4 Healthcare Science Associate Apprenticeship.

Occupation duties

DUTY

Duty 1 Practise safely and effectively within the scope of practice and within the legal and ethical boundaries of the profession.

Duty 2 Look after own health and wellbeing, seeking appropriate support where necessary.

Duty 3 Practise as an autonomous professional, exercising professional judgement.

Duty 4 Practise in a non-discriminatory and inclusive manner recognising the impact of culture, equality and diversity.

Duty 5 Communicate effectively, maintaining confidentiality and records appropriately.

Duty 6 Work with others.

Duty 7 Reflect on, review and assure the quality of own practice.

Duty 8 Draw on appropriate knowledge and skills to inform practise and apply the key concepts of the knowledge base relevant to the profession.

KSBS

K1 K2 K3 K4 K5 K6 K7 K49 K50

S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12

B1 B2 B3 B4 B5

K8 K9 K10

S13 S14 S15

B1 B2 B3 B4 B5

K1 K11

S16 S17 S18 S19 S20 S21 S22

B1 B2 B3 B4 B5

K12 K13 K14 K15

S23 S24 S25

B1 B2 B3 B4 B5

K16 K17 K18 K19 K20 K21 K22 K23 K24
K25 K30

S26 S27 S28 S29 S30 S31 S32 S33 S34
S35 S36 S37 S38

B1 B2 B3 B4 B5

K26 K27 K28 K29 K31

S39 S40 S41 S42 S43 S44 S45

B1 B2 B3 B4 B5

K1 K32 K33 K34

S46 S47 S48 S49 S50 S51 S52

B1 B2 B3 B4 B5

K35 K36 K37 K38 K39 K40 K41 K42 K43
K44 K45 K46 K47 K48

S53 S54 S55 S56 S57 S58 S59 S60 S61
S62 S63 S64 S65 S66 S67 S68 S69 S70

S71 S72 S73 S74 S75 S76 S77 S78 S79
S80

B1 B2 B3 B4 B5

Duty 9 Establish and maintain a safe practice environment.

K7 K49 K50 K51

S81 S82 S83 S84

B1 B2 B3 B4 B5

Duty 10 Promote and prevent ill health.

K52 K53

S85 S86

B1 B2 B3 B4 B5

KSBs

Knowledge

K1: The importance of continuing professional development throughout own career.

K2: The importance of safeguarding and relevant safeguarding processes.

K3: What is required by the Health and Care Professions Council, including but not limited to the Standards of conduct, performance and ethics.

K4: The importance of valid consent which is voluntary and informed, has due regard to capacity, is proportionate to the circumstances and is appropriately documented.

K5: The importance of capacity in the context of delivering care and treatment.

K6: The scope of a professional duty of care and how to exercise that duty.

K7: The legislation, policies and guidance relevant to own profession and scope of practice.

K8: The British, European and International Standards that govern and affect pathology laboratory practice.

K9: The importance of own mental and physical health and wellbeing strategies in maintaining fitness to practise.

K10: How to take appropriate action if own health may affect own ability to practise safely and effectively, including seeking help and support when necessary.

K11: The need for active participation in training, supervision and mentoring in supporting high standards of practice, and personal and professional conduct, and the importance of demonstrating this in practice.

K12: Equality legislation and how to apply it to own practice.

K13: The duty to make reasonable adjustments in practice and be able to make and support reasonable adjustments in own and others' practice.

K14: The characteristics and consequences of barriers to inclusion, including for socially isolated groups.

- K15:** That equality, diversity and inclusion needs to be embedded in the application of all HCPC standards and across all areas of practice.
- K16:** When disclosure of confidential information may be required.
- K17:** The principles of information and data governance and the safe and effective use of health, social care and other relevant information.
- K18:** The need to ensure confidentiality is maintained in all situations in which service users rely on additional communication support, such as interpreters or translators.
- K19:** Recognise that the concepts of confidentiality and informed consent extend to all mediums, including illustrative clinical records such as photography, video and audio recordings and digital platforms.
- K20:** The characteristics and consequences of verbal and non-verbal communication and how these can be affected by difference of any kind including, but not limited to, protected characteristics, intersectional experiences and cultural differences.
- K21:** The need to support the communication needs of service users and carers, such as through the use of an appropriate interpreter.
- K22:** The need to provide service users or people acting on their behalf with the information necessary in accessible formats to enable them to make informed decisions.
- K23:** The risks and possible serious consequences of errors and omissions in both requests for, and results of, laboratory investigations.
- K24:** The need to adhere to protocols of specimen identification, including bar coding and electronic tag systems.
- K25:** The importance of backup storage of electronic data.
- K26:** The principles and practises of other health and care professionals and systems and how they interact with own profession.
- K27:** The need to build and sustain professional relationships as both an autonomous practitioner and collaboratively as a member of a team.
- K28:** The qualities, behaviours and benefits of leadership.
- K29:** Recognise that leadership is a skill all professionals can demonstrate.
- K30:** The need to engage service users and carers in planning and evaluating diagnostics and assessment outcomes to meet their needs and goals.
- K31:** The impact of pathology services on the service user care pathway.
- K32:** The value of reflective practice and the need to record the outcome of such reflection to support continuous improvement.
- K33:** The value of multi-disciplinary reviews, case conferences and other methods of review.
- K34:** The value of gathering and using data for quality assurance and improvement programmes.

- K35:** The structure and function of the human body, together with knowledge of physical and mental health, disease, disorder and dysfunction relevant to their profession.
- K36:** The principles and applications of scientific enquiry, including the evaluation of treatment efficacy and the research process.
- K37:** The roles of other professions in health and social care and understand how they may relate to the role of biomedical scientist.
- K38:** The structure and function of health and social care systems and services in the UK.
- K39:** The theoretical basis of, and the variety of approaches to, assessment and intervention.
- K40:** The underpinning scientific principles of investigations provided by clinical laboratory services.
- K41:** The role of the following specialisms in the diagnosis, treatment and management of disease: cellular science, blood science, infection science, molecular and genetic science and reproductive science.
- K42:** The techniques and associated instrumentation used in the practice of biomedical science.
- K43:** The biological hazards groups and associated containment levels.
- K44:** Recognise a range of research methodologies relevant to own role.
- K45:** Recognise the value of research to the critical evaluation of practice.
- K46:** The implications of non-analytical errors.
- K47:** The extent of the role and responsibility of the laboratory with respect to the quality management of hospital, primary care and community based laboratory services for near- service user testing and non-invasive techniques.
- K48:** The need to assess and evaluate new procedures prior to routine use.
- K49:** The need to maintain the safety of self and others, including service users, carers and colleagues.
- K50:** Relevant health and safety legislation, local operational procedures and policies.
- K51:** The principles of good laboratory practice.
- K52:** The role of own profession in health promotion, health education and preventing ill health.
- K53:** How social, economic and environmental factors, wider determinants of health, can influence a person's health and well-being.

Skills

- S1:** Identify the limits of own practice and when to seek advice or refer to another professional or service.
- S2:** Recognise the need to manage own workload and resources safely and effectively, including managing the emotional burden that comes with working in a pressured environment.
- S3:** Keep own skills and knowledge up to date.
- S4:** Maintain high standards of personal and professional conduct.

- S5:** Promote and protect the service user's interests at all times.
- S6:** Actively look for signs of abuse and engage in relevant safeguarding processes.
- S7:** Respect and uphold the rights, dignity, values, and autonomy of service users, including own role in the assessment, diagnostic, treatment and/or therapeutic process.
- S8:** Recognise that relationships with service users, carers and others should be based on mutual respect and trust, and maintain high standards of care in all circumstances.
- S9:** Obtain valid consent, which is voluntary and informed, has due regard to capacity, is proportionate to the circumstances and is appropriately documented.
- S10:** Exercise a professional duty of care.
- S11:** Apply legislation, policies and guidance relevant to own profession and scope of practice.
- S12:** Recognise the power imbalance which comes with being a health care professional, and ensure it is not for personal gain.
- S13:** Work in accordance with the British, European and International Standards that govern and affect pathology laboratory practice.
- S14:** Identify own anxiety and stress and recognise the potential impact on own practice.
- S15:** Develop and adopt clear strategies for physical and mental self-care and self-awareness, to maintain a high standard of professional effectiveness and a safe working environment.
- S16:** Recognise that they are personally responsible for and must be able to justify their decisions and actions.
- S17:** Use own skills, knowledge and experience, and the information available, to make informed decisions and / or take action where necessary.
- S18:** Make reasoned decisions to initiate, continue, modify or cease treatment or the use of techniques or procedures, and record the decisions and reasoning appropriately.
- S19:** Make and receive appropriate referrals, where necessary.
- S20:** Exercise personal initiative.
- S21:** Demonstrate a logical and systematic approach to problem solving.
- S22:** Use research, reasoning and problem solving skills when determining appropriate actions.
- S23:** Respond appropriately to the needs of all different groups and individuals in practice, recognising this can be affected by difference of any kind including, but not limited to, protected characteristics, intersectional experiences and cultural differences.
- S24:** Recognise the potential impact of own values, beliefs and personal biases, which may be unconscious, on practice and take personal action to ensure all service users and carers are treated appropriately with respect and dignity.
- S25:** Actively challenge barriers to inclusion, supporting the implementation of change wherever possible.

- S26:** Adhere to the professional duty of confidentiality.
- S27:** Respond in a timely manner to situations where it is necessary to share information to safeguard service users, carers and/or the wider public and recognise situations where it is necessary to share information to safeguard service users, carers and/or the wider public.
- S28:** Use effective and appropriate verbal and non-verbal skills to communicate with service users, carers, colleagues and others.
- S29:** Communicate in English to the required standard for the profession.
- S30:** Work with service users and/or carers to facilitate the service user's preferred role in decision-making, and provide service users and carers with the information they may need where appropriate.
- S31:** Modify own means of communication to address the individual communication needs and preferences of service users and carers, and remove any barriers to communication where possible.
- S32:** Use information, communication and digital technologies appropriate to own practice.
- S33:** Communicate the outcomes of biomedical procedures.
- S34:** Keep full, clear and accurate records in accordance with applicable legislation, protocols and guidelines.
- S35:** Manage records and all other information in accordance with applicable legislation, protocols and guidelines.
- S36:** Use digital record keeping tools, where required.
- S37:** Recognise and communicate the risks and possible serious consequences of errors and omissions in both requests for, and results of, laboratory investigations.
- S38:** Use systems for the accurate and correct identification of service users and laboratory specimens.
- S39:** Work in partnership with service users, carers, colleagues and others.
- S40:** Contribute effectively to work undertaken as part of a multi-disciplinary team.
- S41:** Identify anxiety and stress in service users, carers and colleagues, adapting own practice and providing support where appropriate.
- S42:** Identify own leadership qualities, behaviours and approaches, taking into account the importance of equality, diversity and inclusion.
- S43:** Demonstrate leadership behaviours appropriate to own practice.
- S44:** Act as a role model for others.
- S45:** Promote and engage in the learning of others.
- S46:** Engage in evidence-based practice.
- S47:** Gather and use feedback and information, including qualitative and quantitative data, to evaluate the responses of service users to own care.

- S48:** Monitor and systematically evaluate the quality of practice, and maintain an effective quality management and quality assurance process working towards continual improvement.
- S49:** Participate in quality management, including quality control, quality assurance, clinical governance and the use of appropriate outcome measures.
- S50:** Evaluate care plans or intervention plans using recognised and appropriate outcome measures, in conjunction with the service user where possible, and revise the plans as necessary.
- S51:** Select and apply quality and process control measures.
- S52:** Identify and respond appropriately to abnormal outcomes from quality indicators.
- S53:** Apply the principles and applications of scientific enquiry, including the evaluation of treatment efficacy and the research process.
- S54:** Evaluate analyses using qualitative and quantitative methods to aid the diagnosis, screening and monitoring of health and disorders.
- S55:** Change own practice as needed to take account of new developments, technologies and changing contexts.
- S56:** Gather appropriate information.
- S57:** Analyse and critically evaluate the information collected.
- S58:** Select and use appropriate assessment techniques and equipment.
- S59:** Undertake and record a thorough, sensitive, and detailed assessment.
- S60:** Undertake or arrange investigations as appropriate.
- S61:** Conduct appropriate assessment or monitoring procedures, treatment, therapy or other actions safely and effectively.
- S62:** Critically evaluate research and other evidence to inform own practice.
- S63:** Engage service users in research as appropriate.
- S64:** Perform and supervise procedures in clinical laboratory investigations to reproducible standards.
- S65:** Operate and utilise specialist equipment according to own discipline.
- S66:** Validate scientific and technical data and observations according to pre-determined quality standards.
- S67:** Demonstrate proficiency in practical skills in cellular science, blood science, infection science, molecular and genetic science and reproductive science, where appropriate to the discipline.
- S68:** Demonstrate practical skills in the processing and analysis of specimens including specimen identification, the effect of storage on specimens and the safe retrieval of specimens.
- S69:** Demonstrate practical skills in the investigation of disease processes.
- S70:** Work in conformance with standard operating procedures and conditions.

S71: Work with accuracy and precision.

S72: Perform calibration and quality control checks.

S73: Demonstrate operational management of laboratory equipment to check that equipment is functioning within its specifications and to respond appropriately to abnormalities.

S74: Formulate specific and appropriate management plans including the setting of timescales.

S75: Select suitable specimens and procedures relevant to service users' clinical needs, including collection and preparation of specimens as and when appropriate.

S76: Investigate and monitor disease processes and normal states.

S77: Use standard operating procedures for analyses including point of care in vitro diagnostic devices.

S78: Use statistical packages and present data in an appropriate format.

S79: Design experiments, report, interpret and present data using scientific convention, including application of SI units and other units used in biomedical science.

S80: Safely interpret and authorise service user results.

S81: Comply with all relevant health and safety legislation, local operational procedures and policies.

S82: Work safely, including being able to select appropriate hazard control and risk management, reduction or elimination techniques in a safe manner and in accordance with health and safety legislation.

S83: Select appropriate personal protective equipment and use it correctly.

S84: Establish safe environments for practice, which appropriately manages risk.

S85: Empower and enable individuals, including service users and colleagues, to play a part in managing their own health.

S86: Engage in occupational health, including being aware of immunisation requirements.

Behaviours

B1: Demonstrate a logical and systematic approach to problem solving.

B2: Treat people with dignity.

B3: Show respect and empathy for those you work with.

B4: Be adaptable, reliable and consistent.

B5: Uphold high quality and safe practice.

Qualifications

English and Maths

Apprentices without level 2 English and maths will need to achieve this level prior to taking the End-Point Assessment. For those with an education, health and care plan or a legacy statement, the apprenticeship's English and maths minimum requirement is Entry Level 3. A British Sign Language (BSL) qualification is an alternative to the English qualification for those whose primary language is BSL.

Other mandatory qualifications

A Health and Care Professions Council approved BSc (hons) degree; or a BSc (hons) degree that is accredited by the IBMS plus the IBMS Certificate of Competence (Degree containing the IBMS Registration Training Portfolio) approved by the HCPC.

Level: 6 (integrated degree)

Professional recognition

This standard aligns with the following professional recognition:

- Institute of Biomedical Science for Biomedical Science Licentiate
- Science Council for Registered Scientist for (RSci)

Additional details

Regulated standard

This is a regulated occupation.

Regulator body:

EPAO must be approved by regulator body as a HCPC approved Education Provider or IBMS accredited.

Training Provider must be approved by regulator body

EPAO must be approved by regulator body

Occupational Level:

6

Duration (months):

36

Review

This apprenticeship standard will be reviewed after three years

Example progression routes

Enhanced clinical practitioner

Advanced clinical practitioner (integrated degree)

Clinical scientist

Version log

VERSION	CHANGE DETAIL	EARLIEST START DATE	LATEST START DATE	LATEST END DATE
1.1	Standard revised	02/11/2023	Not set	Not set
1.0	Approved for delivery	16/08/2023	01/11/2023	Not set

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