Biomedical Scientists

This document is the second draft of the standards of proficiency following the PLG's meeting on 25th April 2006.

Key:

This document incorporates the agreed changes to the generic standards shown elsewhere.
The profession-specific standards are shown in italics.
Additional standards or wording is shown in bold.
Deleted standards or wording is shown in italicised type, struck-through.
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Expectations of a health professional

1a: Professional autonomy and accountability

Registrant biomedical scientists must:

1a.1 be able to practise within the legal and ethical boundaries of their profession
- understand the need to act in the best interests of patients, clients and users at all times
- understand what is required of them by the Health Professions Council
- understand the need to respect, and so far as possible uphold the rights, dignity, **values** and autonomy of every patient, client and user including their role in the diagnostic and therapeutic process and **in maintaining health**
- be aware of the British, European and International Standards that govern and affect pathology laboratory practice

1a.2 be able to practise in a non-discriminatory **and non-oppressive** manner

1a.3 ~~be able to maintain confidentiality and obtain informed consent~~
understand the importance of and be able to maintain confidentiality

1a.4 **understand the importance of and be able to obtain informed consent**

1a.5 be able to exercise a professional duty of care

1a.6: **be able to practise as an autonomous professional, exercising their own professional judgement**
- be able to assess a situation, determine the nature and severity of the problem and call upon the required knowledge and experience to deal with the problem
- be able to initiate resolution of problems and be able to exercise personal initiative
- know the limits of their practice and when to seek advice **or refer to another professional**
- recognise that they are personally responsible for and must be able to justify their decisions

1a.7 recognise the need for effective self-management of workload **and resources** and be able to practise accordingly

1a.8 understand the obligation to maintain fitness to practise
- **understand the need to practise safely and effectively within their scope of practice**
- understand the importance of maintaining ~~health and care for themselves~~ **their own health**
- **understand the need to keep skills and knowledge up to date and the importance of career-long learning**

~~1a.8 understand the need for career-long self-directed learning~~

1b: Professional relationships

Registrant biomedical scientists must:

1b.1 be able to work, where appropriate, in partnership with other professionals, support staff, patients, clients and users, and their relatives and carers
- understand the need to build and sustain professional relationships as both an independent practitioner and collaboratively as a member of a team
- understand the need to engage patients, clients, users and carers in planning and evaluating diagnostics, treatments and interventions to meet their needs and goals
- **be able to make appropriate referrals**
- *understand the team and discipline approach to the provision of pathology services*
- *be aware of the general working of a hospital*

1b.2 be able to contribute effectively to work undertaken as part of a multi-disciplinary team

1b.3 be able to demonstrate effective and appropriate skills in communicating information, advice, instruction and professional opinion to colleagues, patients, clients, users, their relatives and carers
- be able to communicate in English to the standard equivalent to level 7 of the International English Language Testing System, with no element below 6.5
- understand how communication skills affect the assessment of patients, clients and users, and how the means of communication should be modified to address and take account of factors such as age, physical and learning disability
- be able to select, move between and use appropriate forms of verbal and non-verbal communication with patients, clients, users and others
- be aware of the characteristics and consequences of non-verbal communication and how this can be affected by culture, age, ethnicity, gender, religious beliefs and socio-economic status
- understand the need to provide patients, clients and users (or people acting on their behalf) with the information necessary to enable them to make informed decisions
- understand the need to use an appropriate interpreter to assist patients whose first language is not English, wherever possible
- recognise that relationships with patients, clients and users should be based on mutual respect and trust, and be able to maintain high standards of care even in situations of personal incompatibility
- *be able to inform colleagues and relevant members of the clinical team of outcomes of biomedical procedures to unambiguous standards*

1b.4 understand the need for effective communication throughout the care of the patient, client or user
- recognise the need to use interpersonal skills to encourage the active participation of patients, clients and users

The skills required for the application of practice

2a: Identification and assessment of health and social care needs

Registrant biomedical scientists must:

2a.1 be able to gather appropriate information
- be able to select suitable specimens and procedures relevant to patients' clinical needs, including collection and preparation of specimens as and when appropriate

2a.2 be able to **select and** use appropriate assessment techniques
- be able to undertake and record a thorough, sensitive and detailed assessment, using appropriate techniques and equipment
- be able to demonstrate practical skills in the essentials of measurement, data generation, and analysis
- be aware of the need to assess and evaluate new diagnostics prior to routine use

2a.3 be able to undertake or arrange ~~clinical~~ **~~or scientific~~** investigations as appropriate

2a.4 be able to analyse and evaluate the information collected
- be able to investigate and monitor disease processes and normal states
- be able to use tables and graphs in order to analyse experimental data
- be able to use standard operating procedures for analyses including point of care in vitro diagnostic devices
- be able to use statistical packages and present data as graphs and tables

2b: Formulation and delivery of plans and strategies for meeting health and social care needs

Registrant biomedical scientists must:

2b.1 be able to use research, reasoning and problem solving skills ~~(and, in the case of clinical scientists, conduct fundamental research)~~
- recognise the value of research to the systematic evaluation of practice
- be able to ~~conduct~~ **engage in** evidence-based practice, evaluate practice systematically, and participate in audit procedures
- be aware of ~~methods commonly used in health and social care research~~ a range of research methodologies
- be able to demonstrate a logical and systematic approach to problem solving
- be able to evaluate research and other evidence to inform their own practice
- be able to design experiments, report, interpret and present data using scientific convention, including application of SI units and other units used in biomedical practice

2b.2 be able to draw on appropriate knowledge and skills in order to make professional judgements
- be able to change their practice as needed to take account of new developments
- be able to demonstrate a level of skill in the use of information technology appropriate to their ~~profession~~ **practice**

2b.3 be able to formulate specific and appropriate management plans including the setting of timescales
- understand the requirement to adapt practice to meet the needs of different client groups distinguished by, for example, physical, psychological, environmental, cultural or socio-economic factors
- be able to identify the cause of procedural anomalies and implement remedies

2b.4 be able to conduct appropriate diagnostic or monitoring procedures, treatment, therapy or other actions safely and skilfully
- understand the need to maintain the safety of both patients, clients and users, and those involved in their care
- ensure patients, clients and users are positioned (and if necessary immobilised) for safe and effective interventions
- be able to perform and supervise scientific and technical procedures to reproducible standards
- be able to operate and utilise specialist equipment according to discipline
- be able to validate scientific and technical data and observations according to pre-determined quality standards
- be able to demonstrate proficiency in liquid handling methodologies, including preparation of standard solutions and buffers
- be able to demonstrate practical skills in instrumentation and techniques in: microscopy; spectroscopy; centrifugation; electrophoresis; chromatography; electroanalytical techniques; automated analysis; immunological techniques; enzyme assays and molecular biology techniques; sterilisation techniques and microbial culture; identification and quantitation of microorganisms; microtomy
- be able to 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
- be able to demonstrate practical skills in the investigation of disease processes
- be able to work in conformance with standard operating procedures and conditions
- be able to work with accuracy and precision
- be able to prepare reagents accurately and consistently
- be able to perform calibration and quality control checks
- be able to check that equipment is functioning within its specifications and to respond appropriately to abnormalities
- understand the implications of non-analytical errors
- be aware of near-patient testing and non-invasive techniques

2b.5 be able to maintain records appropriately
- be able to keep accurate, legible records and recognise the need to handle these records and all other **[ ]** information in accordance with applicable legislation, protocols and guidelines
- understand the need to use only accepted terminology (which includes abbreviations) in making **[ ]** records
- recognise the value of test results for clinical audit and as a reference source
- be able to use systems for the accurate and correct identification of patients and laboratory specimens
- understand the need to adhere to protocols of specimen identification, including bar coding and electronic tag systems
- be able to use computer systems for test requesting and reporting
- understand the importance of backup storage of electronic data

2c: Critical evaluation of the impact of, or response to, the registrant's actions

Registrant biomedical scientists must:

2c.1 be able to monitor and review the ongoing effectiveness of planned activity and modify it accordingly
- be able to gather information, including qualitative and quantitative data, that helps to evaluate the responses of patients, clients and users to their care
- be able to evaluate ~~management~~ intervention plans ~~against treatment milestones~~ using recognised ~~health~~ outcome measures and revise the plans as necessary in conjunction with the patient, client or user
- recognise the need to monitor and evaluate the quality of practice and the value of contributing to the generation of data for quality assurance and improvement programmes
- be able to make reasoned decisions to initiate, continue, modify or cease treatment or the use of techniques or procedures, and record the decisions and reasoning appropriately
- understand that outcomes may not always conform to expectations but may still meet the needs of patients, clients or users
- be able to select and apply quality and process control measures that have a statistical or measurable output
- be able to identify and respond appropriately to abnormal outcomes from quality indicators

2c.2 be able to audit, reflect on and review practice
- understand the principles of quality control and quality assurance
- be aware of the role of audit and review in quality management, including quality control, quality assurance and the use of appropriate outcome measures
- be able to maintain an effective audit trail and work towards continual improvement - participate in quality assurance programmes, where appropriate
- understand the value of reflection on clinical practice and the need to record the outcome of such reflection

- recognise the value of case conferences and other methods of review

Knowledge, understanding and skills

3a:
Registrant biomedical scientists must:

3a.1 know the key concepts of the biological, physical, social, psychological and clinical sciences which are relevant to their profession-specific practice
- understand the structure and function of the human body, relevant to their practice, together with ~~a~~ knowledge of health, disease, disorder and dysfunction
- be aware of the principles and applications of scientific enquiry, including the evaluation of treatment efficacy and the research process
- recognise the role of other professions in health and social care
- understand the theoretical basis of, and the variety of approaches to, assessment and intervention
- know the structure, function and metabolism of molecules of biological importance
- understand the structure, function and control of normal and altered genetic material and associated investigative techniques
- understand the immune response in health and disease
- understand the basic structure, classification, biochemistry and control of pathogenic agents
- know the role of the laboratory in the diagnosis and monitoring of specific disease conditions
~~*- understand the role of cellular pathology in the diagnosis and treatment of disease*~~
- understand the role of the following in the diagnosis and treatment of disease: cellular pathology; clinical biochemistry; clinical haematology; clinical immunology; medical microbiology
- be able to evaluate analyses using qualitative and quantitative methods to aid the diagnosis, screening and monitoring of health and disorders
- understand the investigation of different elements that constitute blood in normal and diseased states including the identification of blood group antigens and antibodies
- understand the techniques and associated instrumentation used in the practice of biomedical science
~~*- understand the role of clinical biochemistry and medical microbiology in the diagnosis and treatment of disease*~~

3a.2 know how professional principles are expressed and translated into action through a number of different approaches to practice, and how to select or modify approaches to meet the needs of an individual, groups **or communities**

3a.3 understand the need to establish and maintain a safe practice environment
- be aware of applicable health and safety legislation, and any relevant safety policies and procedures in force at the workplace, such as incident reporting, and be able to act in accordance with these
- be able to work safely, including being able to select appropriate hazard control and risk management, reduction or elimination techniques in a safe manner in accordance with health and safety legislation
- be able to select appropriate personal protective equipment and use it correctly
- be able to establish safe environments for ~~clinical~~ practice, which minimise risks to patients, clients and users, those treating them, and others, including the use of hazard control and particularly infection control
- understand sources of hazard in the workplace, including specimens, raw materials, clinical waste and equipment
- be aware of immunisation requirements and the role of occupational health
- know the correct principles and applications of disinfectants, methods for sterilisation and decontamination and dealing with waste and spillages correctly
- know the use and application of engineering controls e.g. mechanical ventilation systems such as fume cupboards or microbiological safety cabinets
- understand the application of principles of good laboratory practice relevant to health and safety

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