

Professional and scientific roles of the biomedical scientist nursing essay

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Biomedical science is a fast paced and constantly developing field of biological analysis in the healthcare sector with long term career prospects, biomedical science involves carrying out investigations on samples of human tissue and body fluid in order to diagnose disease and correctly monitor the treatment of patients that have been affected by disease. With over 55, 000 registered healthcare scientists in 51 different disciplines work in areas such as biomedical science makes up for 5% of the National Health Services workforce budget (Evered, 2010)

Without biomedical scientist's, operating theatres would simply be unable to function, it is biomedical scientists that provide the results of tests required for clinicians to accurately diagnose and treat such diseases as diabetes, cancer and aids (Institute of Biomedical science, 2010). It is essential that biomedical scientists have adequate communication skills that allow them to clearly communicate with colleagues.

Biomedical scientists in the healthcare sector; particularly in disciplines such as diagnostic pathology, work closely with doctors, nurses and other healthcare professionals for the purpose of maximum efficiency in such prioritised tasks as the diagnosing and treating of patients. In a diagnostic pathology laboratory a biomedical scientist will share information with pathologists (doctor's that have specialised in the in depth workings of cells and human tissue), clinical scientists (scientists that support clinicians with laboratory workings), other biomedical scientists and medical laboratory assistants (assistants in the laboratory responsible for labelling samples and organisation of the laboratory). As a team the diagnostic pathology

laboratory will be able to identify the exact cause of a problem in a particular
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patient and then discuss an appropriate route of treatment for that specific patient.

In order to practice biomedical science within the healthcare sector in the United Kingdom a biomedical scientist must first become registered with the regulatory body of biomedical scientists (and the majority of other healthcare professions); known as the 'Health professions council'. The Health Profession's Council is the board responsible for ensuring that trainee biomedical scientists are fit and safe enough to gain professional registration, the Health Profession's Council also ensure that current biomedical scientists remain fit enough to practice within the healthcare sector and keep up to date with their techniques and analysis procedures, this is done through a process of 'continual professional development' and audit, which will be explained later on in this essay.

Registration usually consists of completing an accredited (BSc) Biomedical science degree programme followed by a period (at least one year) of training in an 'institute approved laboratory', upon completion of training, trainees must present the Health Profession's Council with a 'registration portfolio', a trainee's portfolio must meet the Health Profession's Council's criteria listed in its 'Standards of proficiency' documentations, at which point the Health Profession's Council will appoint the trainee the title of being a 'Biomedical scientist'; in order to protect service users from poor diagnosis/treatment or misconduct 'Biomedical scientist' is a legally protected title meaning it is a criminal offence to fraudulently or prematurely practice biomedical science within the healthcare sector without being

appointed this title, this is in order to ensure that only registered and qualified biomedical scientists that meet the regulatory boards standards can practice in the health sector in the UK (Health Profession's Council, 2010).

The Health Profession's Council's standards of proficiency were first published in July of 2003 however are constantly being updated as the board acquires more in depth knowledge into both the practical and safe workings of the healthcare sector, and the patient experience when dealing with healthcare professionals. The Health Profession's Council has also published a legal document concerning the 'standards of conduct, performance and ethics', this document is important in the smooth running of the entire healthcare system in general, it is in place to ensure that suitable procedures are related to specific patients and that no discriminatory or unfair behaviour takes place between either; managerial staff in the healthcare sector and staff of lower prestige, or staff in the healthcare sector and patients (or in fact anyone else that may be using a biomedical scientists services in order to determine a health related issue).

The professional roles of a biomedical scientist can be portrayed by looking at the Health Profession's Council's 'standards of conduct, performance and ethics' literature, this provides strict guidelines on the expectations of Biomedical Scientists, both in and out of their natural working environment, the document lists 14 points with a detailed summary of each one describing how registered professional of the Health Profession's Council must act towards patients following such rules as "act(ing) in the best interest of

service users [and] respect(ing) the confidentiality of service users” (Health Profession’s Council Standards of Conduct Performance and Ethics, 2008). The (Health Profession’s Council Standards of conduct, performance and ethics, 2008) also describes how registrants must professionally enhance their skills in order to benefit patients, protecting them from the dangers of incorrect diagnosis/treatment, stating that “ you must keep your professional knowledge and skills up to date [and] you must act within the limits of your knowledge, skills and experience, and, if necessary, refer the matter to another practitioner” .

The international regulating body that the United Kingdom is based within is known as the ‘ world health organisation’; this is “ the directing and coordinating authority for health within the United Nations system. It is responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends.” (World Health Organisation, 2010)

The major areas of investigation that biomedical scientists are concerned with include the following;

Cancer Screening

Treating food poisoning

Blood donation services

Infection control

Drug testing

AIDS and HIV diagnosis and treatment

Rapid response labs for accident's and emergencies

Drug therapies

The above regions in biomedical science can be divided in to groups that recognise different aspects of practice in the healthcare sector; these include contemporary diagnostic practice, research, and development. Cancer screening, treating food poisoning, infection control and AIDS and Human Immunodeficiency Virus (A virus that results in the body's immune system attacking itself) development are all determined by contemporary diagnosis practice, growing cell cultures allows a biomedical scientist to isolate and reproduce a specific strain of cells or bacteria; this can then be viewed under a microscope to identify any mutations or pathogens that may be causing a problem to the patient at subject (Institute of Biomedical Science, 2010). There are of course much more complex steps to this procedure, and many other tests that are used to identify different types of disease.

Biomedical scientists dedicated to the research side of the profession are continually looking for new and innovative treatment methods that would improve our knowledge of the relevant subject area and ultimately allow us to find new ways of treating or curing disease.

Biomedical scientists working in the development side of the profession are involved in searching for the most cutting edge techniques that can

hopefully aid the healthcare sector in obtaining faster and more accurate results for patients whilst also aiding in the enhancement of drug's used for treatment, allowing a faster and more concise experience for service users whilst improving quality of life.

The scientific roles of biomedical scientists requires them to possess critical skills in knowledge and data with the basic ability to assess and determine problems, it is often the case that a biomedical scientist will specialise in a specific area of the subject that interests them the most, this is known as a 'discipline', upon graduation there are four main disciplines that biomedical scientists specialise in, these are; microbiology, histopathology, biochemistry and haematology (Institute of Biomedical Science, 2010).

Medical microbiologists are specialised biomedical scientists that are committed to diagnosing disease and illness through two main methods of analysis, traditionally biomedical scientists culture " the patient's specimen onto plates or into broths, in order to isolate and identify bacteria" (Gullon, Institute of Biomedical Science, 2010), however using modern molecular techniques biomedical scientists are able to identify " specific DNA, within the specimen or bacteria" (Gullon, Institute of Biomedical Science, 2010). Cytologists also study human tissue and fluid at a cellular level, using a microscope to determine the cause and correct treatment of disease.

Histopathology is a branch of medicine that is concerned with the causes and processes of disease, a pathology department contains a variety of healthcare professionals working as a team to diagnose disease, a typical pathology department will contain the following staff; pathologists, clinical

scientists, biomedical scientists and medical laboratory assistants.

Histopathology is the examination of tissues and organs that have been removed from patients to provide information on further treatment and diagnosis.

The biochemistry discipline of biomedical science relates to 'clinical chemistry', this is the analysis of body fluids such as blood and urine to study the chemical and biochemical mechanisms of the body in relation to disease.

Haematology, often referred to as 'transfusion science' is another discipline that biomedical scientists are able to specialise in, people that have suffered from severe blood loss require a replacement of blood, and biomedical scientists that are involved in the transfusion science service are concerned with "identification of individual blood groups and compatibility tests of donors' blood with that of the patient." (Barry Hill, Institute of Biomedical Science, 2006) The people providing this service work in a blood transfusion laboratory where their duties include preparing and providing blood for service users that have experienced "road traffic accidents, acute blood loss, anaemia, clotting problems and also leukaemia (during chemo- and radiotherapy) (Barry Hill, Institute of Biomedical Science, 2006), An important aspect of a career in this area is the constant screening of blood for diseases and viruses such as HIV/AIDS and Tuberculosis.

In order to ensure that diagnosis and treatment is as accurate as it can possibly be, diagnostic laboratories have a standard quality assurance/quality control procedure in place, this involves looking over samples at least twice, and checking that the patient's sample and

information is correct before giving feedback on the issue to the patient's doctor or whomever is acting up on the results of the patient (Health Profession's Council, 2010).

As previously mentioned it is important for biomedical scientists to keep up to date on the latest techniques and analysis procedures when working in the health sector, this comes under the title of 'continuing professional development' (CPD), every time a registrant renews their registration they must confirm that they have met the criteria of CPD, if a registrant is selected for audit by the Health Profession's Council they must provide evidence of CPD.

The Health profession's council define continual professional development as being;

“ A range of learning activities through which health professionals maintain and develop throughout their career to ensure that they retain their capacity to practice safely, effectively and legally within their evolving scope of practice” (Health Profession's Council, 2010, [www. hpc-uk. org](http://www.hpc-uk.org))

Biomedical scientist in the health sector should “ have a detailed knowledge of the normal physiology of the body as well as the pathology of disease” (The Biomedical Scientist, 2010), this is a typical example of where continual professional development may require a biomedical scientist to continue reading up on information, as with the constant discoveries and new analytical procedures that are being brought to light on a daily basis it is

important that only the most precise understanding of the physiological workings and reactions of the body should be taken into account.

Upon beginning this essay I was sceptical of what I could achieve by looking into the type of work a biomedical scientist undergoes in the healthcare sector, however I now have a realistic insight into what becoming a biomedical scientist entails, attaining a degree in biomedical science does not lead to one particular career, or even one particular field, the subject is broad and opens a horizon for graduates to focus on many different types of work in the healthcare sector that suit them best, from the research I have done into the different aspects of biomedical science I feel a career in a national blood bank haematology department would suit me very well however my opinion could easily diverge as the course progresses and I learn more about the roles related to such a career.

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