Medical Engineering Applications in Modern Medicine

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Introduction

Over the past years we have experienced a great technological development in healthcare and this is due to the joint work of engineers, mathematicians, physicians, computer scientists and many other professionals. Medical engineering (ME) is an exciting and emerging interdisciplinary field that combines engineering with life sciences. It can be summarized as the application of engineering principles to both the human body and to a broad range of instrumentation used in modern medicine. It can be seen as the application of engineering principles to both human body and to a broad range of instrumentation used in modern medicine. It can be seen as the application of engineering principles to both human body and to a broad range of instrumentation used in modern medicine. It can be seen as the application of engineering principles to both human body and to a broad range of instrumentation used in modern medicine. It can be seen as the application of engineering principles to both human body and to a broad range of instrumentation used in modern medicine. It can be seen as the application of engineering principles to both human body and to a broad range of instrumentation used in modern medicine.

Radiologic scanning instruments like computerized tomography and magnetic resonance imaging scans, haemodialysis machines, vacuum assisted closure (VAC) applications, all robotic and laparoscopic surgical devices and instruments, dentary implants and orthopedic devices, mechanically assisted respiratory machines used in anaesthesiology, cardiac pumps and electrical stimulators are just several examples for this issue.

All medical equipments need to be checked to ensure it is working correctly and safe for patients, and it is the role of healthcare science staff working in ME to do this. It is not just safety checks and maintenance, though. In ME, you would also get involved with the entire equipment lifecycle, including acceptance testing of new equipment, introducing equipment and devices into service, advising on the correct use of equipment, addressing patient safety issues, safely disposing of old devices etc. ME is a really exciting and varied role where you will use your expertise in electronic or mechanical engineering to undertake these activities and perhaps become involved in modifying or constructing equipment as well.

The practitioners undertake a hands-on role with medical devices, working with a wide range of equipment commonly encountered in the hospital environment. They might specialise in certain types of equipment such as that used in renal or radiotherapy treatment, for example. Clinical scientists should specialise in medical device risk management and governance where the role will be more focused on the effective management of equipment, for example ensuring equipment is replaced in a timely fashion and that risks associated with the use of equipment are minimised. Both roles complement each other and collectively contribute to patient health and well-being.

In conclusion, clinicians increasingly rely on the skills of healthcare science staff in ME and so you will regularly liaise with other scientists such as mechanical engineers, doctors and healthcare and/or engineering professionals as part of a multidisciplinary team, all working for the benefit of the patient.

References

1. Hussain HY (2017) Future medical research challenges. Res Med Eng Sci 1(1): 1.
2. Beik J, Khadem S, Attaran N, Sarkar S, Ghadiri H, et al. (2017) A nanotechnology based strategy to increase the efficiency of cancer diagnosis and therapy: Folate conjugated gold nanoparticles. Curr Med Chem 24(39): 4399-4416.
3. Fluet GG, Merians AS, Qiu Q, Saleh S, Ruano V, et al. (2014) Robotic/virtual reality intervention program individualized to meet the specific sensorimotor impairments of an individual patient: a case study. Int J Disabil Hum Dev 13(3): 401-407.
