

The Scientists

A diverse team of scientific and technical professionals is required to ensure the successful manufacture of medical devices. For example:

Clinical Engineers

Manage the application of engineering principles to healthcare equipment, overseeing installation, maintenance, and compliance with safety regulations.

Clinical Technologists

Specialise in on-site maintenance and repair of medical equipment, providing technical support and training to healthcare staff.

Clinical Scientists

Design and develop medical devices, such as imaging equipment and prosthetics, collaborating closely with medical professionals to solve clinical issues.

Quality Assurance Specialists

Ensure quality requirements and performance are achieved for medical devices, utilise different standards and regulations to ensure safe practice, and liaise with manufacturers, companies and organisations to manage device issues

... and many other exciting and life changing roles



IPEM
Institute of Physics and
Engineering in Medicine

This series of leaflets highlights the science and the scientists behind some widely used medical techniques.

They are produced by the Institute of Physics and Engineering in Medicine.


To find out more about Medical Physics or Clinical or Biomedical Engineering, or to request free leaflets or posters in this series, contact us:

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 Institute of Physics and Engineering in Medicine

The Science & The Scientists

Medical device manufacturing

Clinical Engineers ensure that new medical devices manufactured are innovative, safe, effective, and reliable, ultimately improving patient outcomes and enhancing the quality of care.

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Working closely with healthcare professionals, clinical engineers identify unmet clinical needs. They define the specifications for new medical devices and use a multidisciplinary approach, combining medical and engineering expertise to solve the problems.

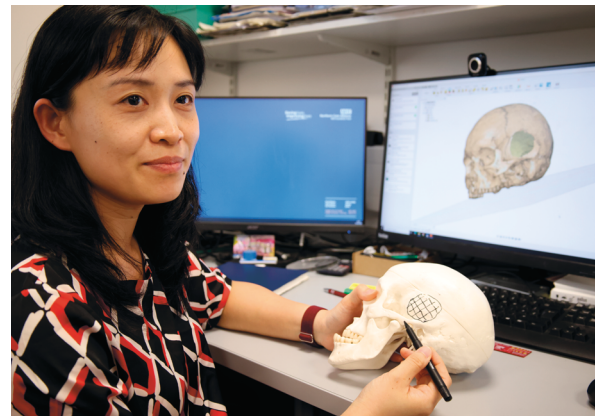


Clinical Engineers

- Work with clinicians, researchers, and industry professionals to turn complex scientific ideas into practical solutions.
- Prioritise user-centric design principles, ergonomics, usability, and overall user experience
- Work closely with regulatory specialists ensuring the medical device meet regulations and standards.
- Perform testing to ensure devices meet industry regulations and international standards
- Conduct risk assessments, refine designs using advanced simulation tools and prototyping techniques.

Patient-Specific Surgical Instruments:

These are bespoke tools designed to aid specific surgical procedures, making surgeries more precise. The use of patient-specific instruments can lead to reduced operating times and improved surgical outcomes, as these tools are tailored to the individual's anatomy and the surgical plan.



Custom Prosthetics and Implants:

Prosthetics are often custom-made to match the unique physiological characteristics of each patient. Precise measurements and advanced technologies are used to create prosthetics that ensure a comfortable fit and optimal functionality, enhancing the patient's mobility and quality of life.

Implants such as cranial plates or orthopaedic devices are fabricated to conform perfectly to a patient's anatomy. These custom implants are crucial in procedures where the exact fit and placement of the implant significantly affect the success of the surgery and the speed of recovery.

Clinical Training Devices and Anatomical Models:

Patient-specific anatomical models and clinical training devices can also be manufactured. These models are used for pre-operative planning, allowing surgeons to practice and strategize complex operations.

They also serve as excellent training aids for medical students and other healthcare professionals, providing a hands-on experience that enhances learning and preparation for real-life medical procedures.

3D Models from Medical Scans:

Utilising data from CT scans, MRIs, or other imaging technologies, Clinical Engineers can produce detailed 3D models of a patient's anatomy. These models are invaluable for diagnostic purposes, surgical planning, and the education of both patients and medical professionals about specific medical conditions or planned interventions.

