The Scientists

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

Engineers
Design and develop new medical devices, responsible for device improvement, safety and quality assurance and service management

Technologists
Responsible for equipment servicing and maintenance, use advanced design and medical image processing tools, utilise 3D printing and other devices for patient use or for research

Clinical Scientists
Support and manage medical devices, design and develop equipment for patient use or within research programs, and teach a wide range of staff and abilities

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

The NHS continually seeks innovative technologies to address healthcare challenges and improve outcomes.

Here are some key aspects of medical device innovation within the NHS:

- Technological development
- Technology evaluation
- Innovation pathways
- Collaboration with industry
- Clinical trials and research
- Regulatory compliance and advice
- Protecting Intellectual Property (through patents and registered designs)

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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IPEM
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The Science & The Scientists

Medical Device Innovation Services

Innovations in medical devices within the National Health Service (NHS) in the UK have been crucial for improving patient care, enhancing efficiency, and reducing costs.

What is medical device innovation?

- Identifying specific patient challenges
- Providing affordable and sustainable solutions to patients using new products and surgical techniques without compromising on quality and safety.

All medical devices started off as an idea and a blank piece of paper. Including:

- blood glucose monitors,
- pregnancy testers,
- electrocardiogram recorders (ECG),
- magnetic resonance imaging (MRI),

Medical device innovation in the NHS:

Involves collaboration between:

- healthcare providers,
- industry partners,
- regulators,
- patients

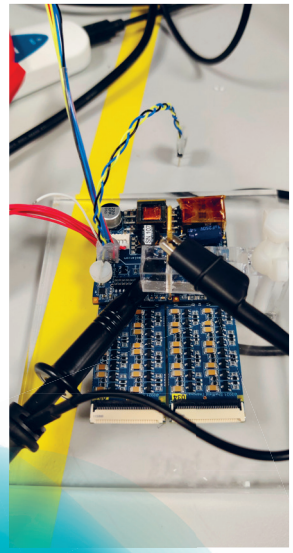
to develop and implement technologies that improve patient care and healthcare delivery.

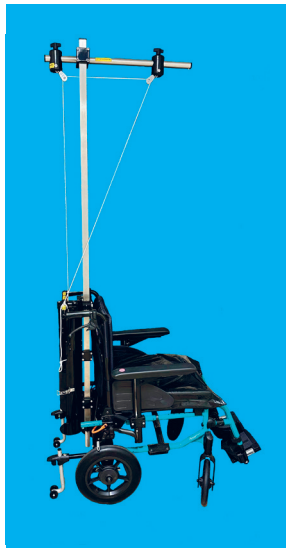
Design and Development

The utilisation of electronic/mechanical/software design and development, which can include Computer Aided Design and Manufacturer (CAD and CAM), to bring these ideas to life.

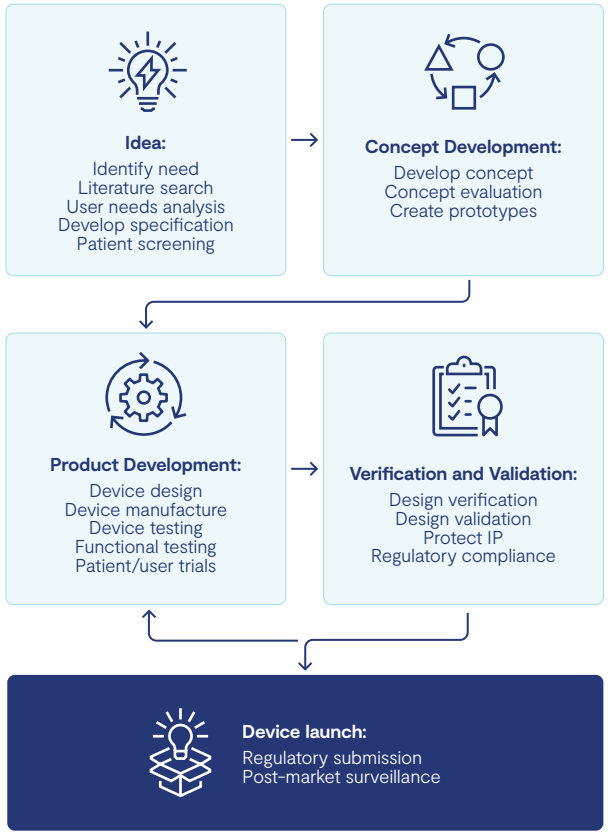
Design and development is a complex process that involves a number of considerations to produce a safe, effective, and legally compliant medical device.
These include:

- physiology and pathology,
- biocompatibility,
- usability,
- basic science or new metrology techniques,
- electromagnetic compatibility,
- IT networking,
- infection prevention,
- safe working loads,
- fail safe modes,
- compliance to regulations and standards,
- operating within quality management systems.





Medical device innovation process example:



"Supporting innovation across the healthcare system is more important than ever and will be central to securing transformation and improved patient outcomes."

"Healthcare innovation is constant; from single devices transforming patients' experience of care, through to large-scale projects which reimagine the way in which treatment itself is delivered".

NHS Innovation into action, 2015.

https://www.england.nhs.uk/wp-content/uploads/2015/10/nhs-inovation-into-action.pdf