

## Composition of HTM Field

Healthcare Technology Management (HTM) is the field responsible for managing the selection, proactive and corrective maintenance, and safe and effective use of medical equipment and systems. The HTM field entails strategic planning, evaluation, procurement, maintenance and service management, replacement planning, project management and quality assurance. Healthcare Technology Management professionals include Biomedical Equipment Technicians, Imaging Engineers, Clinical Engineers, Clinical Systems Engineers, Healthcare Technology Managers and Directors, and others who promote the safe and effective use of healthcare technology. Below is a brief description of the professionals found in Healthcare Technology Management.

**CLINICAL ENGINEER** – an engineering professional who focuses on healthcare technology planning, evaluation, management, analysis, education, support, and regulatory compliance

**CLINICAL SYSTEMS ENGINEER** – an engineering professional that focuses on ensuring the effective deployment, integration and support of multi-component and interconnected medical systems.

**HEALTHCARE TECHNOLOGY MANAGER/DIRECTOR** – a management professional responsible for planning and directing activities of others, monitoring their work, and taking corrective actions when necessary in the support of healthcare technology.

**BIOMEDICAL EQUIPMENT TECHNICIAN** – a technical professional who focuses on inspection, preventative maintenance and repair of medical devices and systems.

**BIOMEDICAL EQUIPMENT SPECIALIST** – a field modality expert who demonstrates a working knowledge of clinical equipment such as radiology, laboratory, or networking.

**MEDICAL EQUIPMENT PLANNER** – a technical professional who focuses on implementation of healthcare technology during planning, design, and construction of healthcare facilities.

## The ACCE Code of Ethics

### In the fulfilment of our duties, Clinical Engineers will:

- Hold paramount the safety, health, and welfare of the public
- Improve the efficacy and safety of healthcare through the application of technology
- Support the efficacy and safety of healthcare through the acquisition and exchange of information and experience with other engineers and managers
- Manage healthcare technology programs effectively and resources responsibly
- Accurately represent their level of responsibility, authority, experience, knowledge and education and perform services only in their area of competence
- Maintain confidentiality of patient information as well as proprietary employer or client information, unless doing so would endanger public safety or violate any legal obligations.
- Not engage in any activities that are conflicts of interest or that provide the appearance of conflicts of interest and that can adversely affect their performance or impair their professional judgment
- Conduct themselves honourably and legally in all their activities.



## What is Clinical Engineering?



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## What is Clinical Engineering?

A **Clinical Engineer** is a professional who supports and advances patient care by applying engineering and managerial skills to healthcare technology.

ACCE Definition, 1992.

As clinical medicine has become increasingly dependent on more sophisticated systems and technologies and the complex equipment associated with it, the clinical engineer, as the name implies, has become the bridge between modern medicine and equally modern engineering.

Clinical Engineering education is based on classical engineering, supplemented with a combination of courses in anatomy, physiology, human factors, systems analysis, medical terminology, electronics and electrical theory, measurement, and instrumentation. It is often capped with a practicum or internship in a clinical (hospital, university medical center, clinic or similar) settings, giving the student a firm grounding in hospital operations, protocols, regulations, and ethics.

This background prepares the clinical engineer to fill a variety of roles in research, design, academia, and most often, in the clinical environment. In daily practice, the clinical engineer often serves as the translator between medical/ clinical, Information Technology (IT), and business professionals, coordinating projects with facilities, construction and facility planning, nursing, and other departments within the hospital. Today, healthcare technology extends into information and communications systems and traditional medical equipment is more complex than ever. Assessing, managing, and solving problems in this hyper-tech world is the work of the clinical engineer.

In a hospital, healthcare asset management firm, healthcare technology design/ development company or healthcare technology service company, a clinical engineer often functions as the technology manager for medical equipment systems. The responsibilities in these settings include financial or budgetary management, service

contract management, maintenance activity coordination, asset management, IT coordination, project management, and regulatory compliance. The hospital-based clinical engineer may also have responsibility for supervision of the in-house maintenance staff, depending on his or her skill set and the structure of the department. Hospital-based clinical engineers also fill other important functions in assuring that the medical equipment is safe and effective.

The functions of a hospital-based Clinical Engineer include participation in the planning of healthcare technology procurement and assessment of medical equipment to assure that new products will meet the needs of tomorrow's medical practice. Often, they work with teams of clinical stakeholders and other hospital-based professionals in evaluating new products or concepts as well as during clinical trials. Clinical Engineers are involved in all aspects of the product life-cycle, from strategic medical technology planning and product assessment to procurement, implementation, and support. A Clinical Engineer actively participates in training and education of technical and medical personnel throughout the product life-cycle to ensure safe and effective medical equipment. Clinical Engineers also help ensure hospitals follow recalls and hazard alerts issued by medical device manufacturers and often participate in investigation in medical device incidents. Clinical Engineers conduct or help administration conduct equipment utilization studies to assess and plan for usage of the equipment within the departments. Clinical Engineers also participate in the equipment replacement planning as the end of life cycle of a product approaches.

The scope of these activities is expanding significantly as healthcare technology continues to become more complex and integrates with communication and information systems. Clinical Engineers involved in medical device implementation may oversee integration activities between clinical systems, as well as utilize cybersecurity measures to protect medical device and patient data.

Clinical Engineers can also work in private practice, consulting in a variety of settings as expert witnesses, equipment planners, and Healthcare Technology Managers, or serve in governmental or international bodies such as the Food and Drug Administration or the World Health Organization.

Clinical Engineers have a long history of collaboration to find economic approaches to broad technology issues facing the healthcare system. Many ACCE members provide technical leadership and serve on task forces actively working on improving patient safety through medical error reduction.

The American College of Clinical Engineering (ACCE) offers a Clinical Engineer certification program and a heritage of publishing, teaching, and humanitarian programs designed to "give back" to society and to prepare the next generation of practitioners. Certified Clinical Engineers (CCEs) follow an established code of ethics and understand that the opportunity to practice in healthcare carries the responsibility to always give one's best, maintain appropriate discretion, and keep the well-being of the patient as the highest priority.

## Difference Between Clinical Engineers and BMETs

Clinical Engineers are often confused with another professional group in the hospitals, the Biomedical Equipment Technicians (BMETs). In reality, these two groups perform different but equally valuable functions. The BMET is often the person responsible for direct support, service, and repair of the medical equipment in the hospital.

BMET education and training is usually of a more directly technical nature, and is supplemented with specific schooling in service on the equipment. BMETs answer the call when medical equipment fails to function properly and must work closely with nurses and other hospital staff, as well as the equipment vendor, as they service and maintain the equipment.

