Defining Job Roles and Responsibilities

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Agenda

- Job Roles & Responsibilities
  - Technicians
  - Engineers
  - Managers
- Career Development
- Recruiting
Clinical Engineering on the Hospital Organizational Chart

CHIEF EXECUTIVE OFFICER

CHIEF OPERATING OFFICER

VICE PRESIDENT MEDICAL SUPPORT SERVICES

MEDICAL STAFF OFFICER

MEDICAL DIRECTOR QAUR

Director of Medical Records

Director of Patient Registration

Administrative Director Pharmacy

Director of Social Work and Discharge Planning

Director of Clinical Risk Management

Director of Laboratory Services

Director of Radiology Services

Director of QAUR and Infection Control

Director of Clinical Engineering
Job Titles & Responsibilities

Clinical Engineering Department

- Director of Clinical Engineering Dept
- Clinical Engineer (CE)
- Human Factors (HF) Engineers
- Biomedical Equipment Technicians (BMETs)
- Managers/Supervisors
  - BMET Supervisor
  - CE Supervisor
- Junior CE
- Senior CE
- BMET
- BMET II
- BMET III

- Junior CE
- Senior CE
- BMET
- BMET II
- BMET III
Job Responsibilities – CE

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

- ACCE Definition, 1992
American College of Clinical Engineering

Clinical Engineer {defined}

"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 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 in classical engineering, supplemented with a combination of courses in physiology, human factors, systems analysis, medical terminology, measurement, and instrumentation. It is often capped with a practicum or internship in a university hospital setting, giving the student a firm grounding in hospital operations, protocols, and ethics.

All of 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 walking between the worlds of the medical, engineering, and business professionals. 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.

What Clinical Engineers Do

Clinical engineering is an interdisciplinary field practiced in a variety of settings: and presenting a diversity of challenges from the equipment design and management of complex systems to the development of policies and procedures required to ensure the appropriate use of technology.
Job Responsibilities – CE

- Safety - patient, visitor, caregiver (Safety “Watchdog”)
- Incident Investigations
- Technology Management
  - Technology Assessment
  - Equipment Planning
  - Evaluation of Investigational Devices
  - Financial Planning
  - Equipment Life Cycle Analysis
  - Service Contract Management
Job Responsibilities - CEs

- Technology Consultations
- Facility Management/Constructions
- Information Technology/Telecommunications
- Research, Design & Development
- Standards and Regulations
- Ethics
- Quality controls
Job Responsibilities - CEs

- Education and Training
- Supervision
- Coordination of in-house operations
- Collaboration with other healthcare professionals such as Information Technologists, Systems Engineers, Clinicians, Physicians, Purchasing, ....
Job Responsibilities - BMETs

A biomedical engineering technologist or biomedical equipment technician (BMET) is one who is knowledgeable in the theory of operation, the underlying physiological principles, and the safe clinical application of biomedical equipment.

- AAMI
Job Descriptions

BMET: Biomedical Equipment Technician I
An entry-level or junior BMET. Works under close supervision. Performs skilled work on preventive maintenance, repair, safety testing, and recording functional test data. Usually has less than four years of experience.

BMET: Biomedical Equipment Technician II
A BMET who usually has an AS (2-year) degree or higher and several years of related or equivalent experience. Has good knowledge of schematics and works independently on repairs, safety testing and preventive maintenance (PM). Maintains records, writes reports, and coordinates outside repairs. Average experience is eight years.

Sr. BMET: Biomedical Equipment Technician III
A highly experienced or specialized BMET usually having an AS (2-year) degree or higher. Has substantial experience and may be certified (CBET). Does highly skilled work of considerable difficulty. Has comprehensive knowledge of practices, procedures, and types of equipment. Average experience is twelve years.

Equipment Specialist: Lab Equipment Specialist (LES) or Radiology Equipment Specialist (RES)
A highly specialized BMET having special training, or equivalent experience in lab equipment (LES) or radiology equipment (RES). Usually has an AS (2-year) degree or higher. Performs highly skilled work of considerable difficulty and may hold certification as SLES or CRES.

BMET Supervisor

A highly experienced BMET with supervisory duties. Has extensive knowledge of equipment and operations and is responsible for the coordination of work projects. Average experience is fifteen years.
Job Responsibilities - BMETs

- Equipment Maintenance
  - Incoming Equipment Inspections
  - Corrective Maintenance
  - Preventive Maintenance
  - Calibrations
- Equipment Installations
Job Responsibilities - BMETs

- Equipment Evaluations
- Equipment Control and Safety
  - Knowledge of codes and standards
- Equipment Modifications
- Facility Construction
- Ethics
Job Responsibilities – LES and RES

◆ Equipment Specialist: Lab Equipment Specialist (LES) or Radiology Equipment Specialist (RES)
  – A highly specialized BMET having special training, or equivalent experience in lab equipment (LES) or radiology equipment (RES). Usually has an AS (2-year) degree or higher. Performs highly skilled work of considerable difficulty and may hold certification as CLES or CRES.
Education Requirements - CEs

- Undergraduate Degree Education (4-years)
  - Biomedical or other specialty engineering degree with significant knowledge in physiology, medicine, and clinical care of patients. Oral and written communication skills are essential.
  - Practical training
Education Requirements - CEs

- Graduate Degree Education (MS, PhD)
  - Biomedical or clinical engineering degree
  - Management degree
  - Certifications (CCE, CSSBB)
  - Internship at hospital or medical device industry
Education Requirements - BMETs

- **Associate Degree Education (2 years)**
  - Technical degree focused on engineering, technology and life sciences. Oral and written communication skills are essential.
  - Practical training in hospital

- **Bachelor Degree Education (4 years)**
  - Biomedical or other specialty technical engineering degree
  - Practical training in hospital
Career Development - CEs

- Continuing education to expand and improve skills
- Management education
- Ongoing training (computer skills, project management, professional societies, conferences)
- Clinical Engineering Certification
- Other certifications: CSSBB (Six Sigma)
- Focus on Human Factors, IT
Career Development - BMETs

- Continuing education on new and more complex medical equipment
- Management education - supervision
- Ongoing training (conferences, professional societies)
- CBET (certified biomedical engineering technician)
- Specialization in Lab Equipment or Radiology/Imaging Equipment
Recruiting

- College and University Career Recruiting
  - Internships
- Professional Organizations/Societies Websites (AAMI, ACCE, BMES, Monster)
- Professional Journals (ASHE, AAMI, 24x7)
ACCE Code of Ethics

♦ Strive to prevent a person from being placed at risk of injury due to dangerous or defective devices or procedures.

♦ Accurately represent my level of responsibility, authority, experience, knowledge and education.

♦ Reveal any conflicts of interest that may affect information provided or received.
ACCE Code of Ethics

♦ Protect the confidentiality of information from any source.
♦ Work toward improving the delivery of health care to all who need it.
♦ Work toward the containment of costs by the better utilization of technology.
♦ Promote the profession of clinical engineering.
References

- University of Connecticut - Biomedical Engineering (www.bme.uconn.edu)
- Biomedical Engineering Program at Case Western University (www.cwru.edu)
- Schoolcraft College (www.schoolcraft.cc.mi.us)
- British Columbia Institute of Technology (www.health.bcit.ca/biomed)
- CE Certification (www.acce-htf.org)
References


Supplemental Materials

- Job Codes at Duke University
- Job Descriptions for CE, BMET and others from AAMI
- ACCE Clinical Engineer and Job Responsibilities
Muchas Gracias

¿Preguntas?