



BEAI Position Paper on

Clinical Engineering in the Irish Public Health System

Role, Resourcing and Emerging Challenges

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Version 1*

Executive Summary

Clinical Engineering is a safety-critical function within modern healthcare systems. Clinical Engineers ensure that medical devices and associated digital systems are safe, effective, compliant and operational throughout their lifecycle. As healthcare delivery becomes increasingly dependent on complex, networked and software-driven medical technologies, the role of Clinical Engineering has become central to patient safety, service continuity and the resilience of the health system.

Recent developments in medical technology and regulation have significantly expanded the scope and complexity of this role. Medical technology has evolved dramatically in recent years. Medical Electronic Equipment (MEE) and Medical Electronic Systems (MES) are increasingly software-driven, networked, interoperable, and regulated under complex European legislation, standards and regulations. This includes but is not limited to the Medical Device Regulation (MDR - **Regulation (EU) 2017/745**), international quality standard (ISO13485), risk management standard (ISO14971) and technical standards (example IEC60601-1 suite) and the EU Artificial Intelligence Act (**Regulation (EU) 2024/1689**). Regulatory compliance and effective deployment of complex medical technology means that the knowledge, skills and competencies required of Clinical Engineers have expanded significantly. These changes require highly skilled professionals capable of managing regulatory compliance, system integration, cybersecurity risks and the safe deployment of increasingly sophisticated technologies.

Within hospitals and health services, Clinical Engineers provide oversight across the full lifecycle of medical technology. This includes procurement specification and evaluation, regulatory and safety assessment, commissioning and integration with clinical systems, maintenance and performance management, cybersecurity assurance support, post-market surveillance and end-of-life planning. Through these functions, Clinical Engineers act as a critical interface between clinical practice, operational services and complex technical systems.

Despite the growing strategic importance of this role, the Clinical Engineering workforce within the Irish public health system faces structural challenges. Clinical Engineers are currently employed across multiple grading structures, most notably Clinical Engineering Technician grades and Medical Physicist grades, with significant differences in remuneration and career progression. At the same time, the majority of the workforce now holds Level 8 qualifications, with many possessing postgraduate qualifications reflecting the increasing complexity of modern healthcare technologies. This misalignment between responsibilities, qualifications and grading structures is contributing to recruitment and retention pressures.

Without a stable and appropriately resourced Clinical Engineering workforce, there are risks to patient safety, service resilience and the effective management of healthcare

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technology. These risks include delayed or suboptimal technology procurement, challenges in integrating medical devices with digital health systems, increased cybersecurity exposure and higher lifecycle costs associated with poorly planned technology deployment.

This paper identifies an opportunity to strengthen the role of Clinical Engineering within the Irish health system. Key priorities include formal recognition of Clinical Engineering as a safety-critical Health and Social Care Profession, alignment of grading structures with the complexity and responsibility of the role, and the development of coordinated workforce planning to support recruitment, retention and future service needs. These measures would support patient safety, enhance system resilience and enable the effective delivery of national digital health and medical technology strategies.

The Role of Clinical Engineering

A Clinical Engineer applies engineering, scientific and managerial expertise to healthcare technology to support and advance patient care.

Clinical Engineers function as medical technology managers within hospitals and health services. They:

- Ensure medical equipment is safe, effective and compliant with regulations;
- Support technology across its full operational lifecycle;
- Work closely with clinicians to optimise device selection and use;
- Bridge the gap between clinical practice and technological systems.

Core responsibilities include:

- Simultaneous scheduled and unscheduled maintenance and management of large fleets of equipment from simple to highly complex;
- Development of tender specifications and evaluation;
- Regulatory compliance and safety assessment;
- Commissioning and integration with clinical systems;
- User training;
- Contingency planning;
- Collaboration with clinicians at the bedside to optimize care delivery;
- Post-market surveillance and vigilance;
- System integration and interoperability;
- Collaboration with ICT and cyber leads on cybersecurity assurance for connected medical equipment;
- Lifecycle and cost analysis;

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- Decommissioning planning.

Clinical Engineering is not a purely technical support function. It is a governance, assurance and patient safety function.

Grading & Professional Structures

Clinical Engineers in Ireland are currently paid under two distinct grading structures:

- Clinical Engineering Technician grades
- Medical Physicist grades

Medical Physics grades are remunerated at a higher scale. There is inconsistency in the Irish Healthcare system in the number of and grading structure for clinical engineering professionals^{1,2}.

Today, the majority of Clinical Engineers hold at least Level 8 qualifications. Many possess postgraduate qualifications appropriate to modern medical technology complexity challenges and risk mitigations. Clinical engineers are leaving posts remunerated at Clinical Engineering technician grades and moving to posts at Medical Physicist grades resulting in a crisis for technical support at some sites, with the potential for extended loss of critical clinical services and healthcare delivery which is technology dependent.

Several professions (e.g. audiologists) in the public health system use Medical Physics grading structures to attract and retain specialist staff, so there is a documented precedent for recognition of workforce crises within professions with specialist skills.

There is also inconsistency in the primary department of Clinical Engineers working in Irish Hospitals and healthcare settings. Clinical Engineers may be members of stand-alone Clinical Engineering Departments, of Estates or Technical Services Departments, or in joint Medical Physics and Clinical or Biomedical Engineering Departments.

There is an urgent need for standardisation of the clinical engineering profession within HSE HSCP structures including clinical supervision. Without reform, public health services risk losing essential expertise and will consequently face patient safety implications.

¹ In a 2019 survey, Clinical Engineers responded that they were employed a physicists, clinical engineers, clinical engineering technicians and biomedical engineers.

² In a 2019 survey of those working in Clinical Engineering in Irish hospitals indicated that at that time 60% of respondents (N=157) had NFQ level 8, 9 or 10 qualifications and this percentage is expected to be higher at this time.

Impact on Patient Safety and System Resilience

Without a specialised, stable, structured and appropriately educated and competent Clinical Engineering workforce within the public health system, there is a risk of:

- Delayed or suboptimal advice on medical equipment selection and deployment configuration;
- Procurement decisions that fail to account for lifecycle, integration, and safety implications;
- Failed or delayed medical equipment integration due to insufficient interoperability expertise;
- Service disruption due to lack of technical resilience;
- Costly remediation of failed medical technology integration, for clinical workflow or technical reasons due to inadequate horizon scanning and technical planning;
- Poor management of cybersecurity vulnerabilities;
- Increased lifecycle costs and reactive medical equipment replacement.

The Way Forward

1. Reframing the Profession

Clinical Engineering should be formally recognised as a patient safety-critical, HSCP profession with a career pathway appropriate to the complexity and criticality of modern medical technology and digital health systems.

2. Alignment of Grading Structures

Clinical Engineering grades should reflect:

- The safety risk inherent in medical technology management;
- The complexity of networked, software-driven medical technologies;
- The current highly qualified work force which is not reflected in Clinical Engineering structures;
- Market competition for skilled clinical and biomedical engineers;
- The strategic importance of medical device integration in delivering on the Department of Health Digital for Care 2030 framework³;
- The need for consistent national HSCP workforce standards including structured training and progression grades, and professional development competencies.

³ <https://about.hse.ie/our-work/technology/digital-for-care-2030/> (accessed 8 March, 2026)

3. Workforce Planning

The following steps must be taken as a matter of urgency:

- assess current and future demand;
- identify skill gaps in clinical engineering workforce;
- standardise grading and professional structures in clinical engineering workforce;
- align education and career pathways to service needs;
- employer engagement with Forasa (representative trade union for Clinical Engineers);
- and support recruitment and retention strategies.

4. Strategic Involvement

Clinical Engineers play a key role in the following major functions within the public health system, and are a key voice in development of effective strategy pertaining to medical technology:

- Digital transformation programmes
- Medical device integration initiatives
- Cybersecurity planning
- Procurement strategy
- Regulatory assurance processes.

Conclusion

Clinical Engineering is a safety-critical profession essential to modern healthcare delivery. Reframing and regrading Clinical Engineering, alongside robust workforce planning, represents an opportunity to strengthen patient safety, enhance system resilience and ensure sustainable management of Ireland's medical technology fleet.

The BEAI stands ready to support constructive engagement with the HSE and Department of Health to ensure the profession is positioned to meet the dynamic technology challenges and opportunities presented by modern healthcare.