# The Clinical Technologist: Scope of Practice

Clinical Technologists work in NHS hospitals, private health care, academic institutions, and the medical device industry. Registrants can be Healthcare Scientists specialising in the practical application of physics, engineering and technology to clinical practice. Registrants can also be Sonographers who are are health care professionals specialising in ultrasound imaging and interventional procedures using ultrasound guidance.

Clinical Technologists perform invasive procedures on patients, or make clinical interventions, or, exercise judgement that can substantially impact on patient health or welfare. When acting autonomously within their area of expertise they have potential to cause harm to patients.

The practice of Clinical Technologists is divided into Clinical Physics, Clinical Engineering and Sonography. They work in the following disciplines:

Clinical Physics Technologist

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| Nuclear Medicine:- | Practiced by Nuclear Medicine Technologists |
| Radiotherapy Physics:- | Practiced by Radiotherapy Physics Technologists |
| Radiation Physics :- | Practiced by Radiation Physics Technologists |

Clinical Engineering Technologist

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| Medical Engineering:- | Practiced by Medical Engineering Technologists |
| Radiation Engineering:- | Practiced by Radiation Engineering Technologists |
| Rehabilitation Engineering:- | Practiced by Rehabilitation Engineering Technologists |
| Renal Technology:- | Practiced by Renal Technologists |

Sonographer

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| Sonography:- | Practiced by Sonographers |

Bone Densitometry

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| DXA:- | Practiced by Bone Densitometry Technologists/Technicians |

The scope of practice of each of these disciplines is described overleaf. For each discipline there is an introduction, a broad overview, and a description of the specialised tasks practiced. The scope of practice statements describes the attributes that would be expected from a newly qualified Clinical Technologist at the point of registration. Once registered all registrants are required to confirm they continue to meet all the professional standards and adhere to the RCT Code of Conduct. They are also required to undertake continuous professional development relevant to their role.

# Physics Scope of Practice

Clinical technologists work independently, or as part of multidisciplinary teams, providing specialist physics services and technical knowledge enabling patient care.

**Clinical Technologists:**

- Conduct safe working practices applying risk management and health and safety principles
- Produce risk assessments
- Work safely specifically with regard to radioactive, biological and chemical hazards in accordance with current legislation
- Produce and review incident reports
- Perform equipment management procedures
- Operate quality management systems
- Use computer systems and software appropriate to their work
- Operate medical equipment, performing calibration, equipment quality assurance and equipment quality control
- Work as “Operator” under the requirements of the IR(ME)R regulations
- Carry out equipment acceptance and safety testing
- Perform assessments, interventions and equipment handovers
- Perform quality control procedures and review and interpret quality control results
- Perform measurements, checks and tests required in order to prescribe or design technology solutions
- Maintains appropriate records
- Communicate effectively with stakeholders
- Undertakes all mandatory training
- Maintains a professional and courteous attitude
- Operate in accordance with Good Scientific Practice

## Radiotherapy Clinical Technologists Specifically:

Dose Planning / Virtual Simulation

- Check the relevance of patient data and patient related data to ensure validity, consistency and completeness
- Provide treatment parameters and dosimetric data for patients to undergo radiotherapy
- Transfer of data from imaging equipment to computerised treatment planning systems
- Outline anatomical structures for standard treatments
- Design an individual treatment plan for standard treatment techniques
- Define treatment field parameters for simple treatment techniques using virtual simulation software
- Define appropriate isocentre
- Conform treatment fields using multi-leaf collimators etc.
- Mark beam directional shell with relevant reference points
- Perform simple dose calculations for standard treatment techniques

- Transfer data to record and verify systems and/or treatment planning system

Mould Room

- Make appropriate immobilisation devices for patients using appropriate materials and techniques.
- Manufacture individually custom-made beam direction, modifying and shielding devices for radiotherapy treatment
- Monitor and react to changing needs of the patient whilst in the Mould Room or undergoing brachytherapy procedures
- Provide advice and point of contact for patients throughout the Mould Room process.
- Operate a broad range of mould room equipment

Brachytherapy

- Calculate treatment times for brachytherapy using individual and library plans and standard data as appropriate
- Participate in the delivery of brachytherapy treatments using a range of applicators and treatment equipment
- Provide safe care and custody for all sealed sources on site including record keeping, stock control and disposal
- Leak test sealed radioactive sources
- Manage the cleaning and sterilisation of brachytherapy sources and applicators.
- Provide brachytherapy technical support in theatre

Quality Control of Radiotherapy Systems

- Undertake quality control for a range of Imaging equipment, treatment planning systems, radiotherapy treatment units, and dosimetry equipment
- Participate in quarterly and annual QC checks of treatment equipment using a range of measuring devices

Dose Measurements

- Perform dose measurements to support radiation treatment
- Use a wide range of dosimeters for a variety of dose measurements types in accordance with established procedures
- Correctly read and interpret measurements from the range of equipment used.
- Ensure that all Dosimetry equipment is used in a manner such that they are not damaged or used inappropriately
- Take appropriate action when measurements taken on treatment machines fall outside expected tolerances

## Nuclear Medicine Clinical Technologists Specifically:

### Radiopharmacy

- Prepares the aseptic area for production according to local procedures including preparation of self
- Performs QC checks prior to use of LFC / Isolator
- Aseptically manufacture the radioactive and non-radioactive medicinal products including the accurate dispensing of patient doses in accordance with local diagnostic reference levels
- Assist in the labelling and documentation
- Dispatch of radioactive materials to intended user

### Imaging/Therapy procedures

- Prepare the patient and the environment for imaging procedures
- Perform a wide range of imaging procedures
- Acquire and record data during imaging procedures
- Assist in hybrid imaging procedures
- Process the images using appropriate computer software and calculate quantitative results.
- Observes/assists in preparing the patient for therapy treatments
- Observes/assists in the administration of therapy

### Non-Imaging procedures

- Prepare the patient and the environment for non-imaging procedures
- Perform a range of non-imaging diagnostic procedures
- Collect, prepare and measure radioactive content of biological specimens
- Calculate quantitative results

### Radiation protection

- Manage radioactive patients who have undergone diagnostic investigations
- Provide information to patients, members of the public and other healthcare professionals regarding radiation protection controls after nuclear medicine procedures
- Receive, store and dispose of radioactive and non-radioactive materials and products according to local protocols and environmental authorisations
- Maintain records of radioactive waste
- Carry out contamination monitoring of areas using unsealed sources and decontaminate as necessary

## Radiation Physics Clinical Technologists Specifically:

Environment and Equipment QA

- Audit facilities using all forms of ionising and non-ionising radiation, for compliance with current legislation
- Measure shielding and protection in new and existing radiation facilities.
- Assess staff and patient protection devices
- Participate in commissioning, acceptance testing and quality assurance testing of a range of ionising and non-ionising imaging equipment, therapy equipment and image production and storage devices
- Participate in analysis and interpretation of results
- Assist with the analysis and interpretation of patient dose data

Equipment calibration and personal monitoring

- Calibrate ionising and non-ionising radiation measuring instruments
- Participate in the provision of radiation monitoring services for staff, patients and the environment

Management of Sealed and Unsealed Sources

- Leak test sealed radioactive sources.
- Carry out contamination monitoring of areas using unsealed sources and decontaminate as necessary
- Maintain inventories and carry out audits of radioactive sources/substances
- Transport radioactives in accordance with legislatory requirements
- Receive, store and dispose of radioactive and non-radioactive materials and products according to local protocols and environmental authorisations
- Maintain records of radioactive waste

## Engineering Scope of Practice

Clinical engineering technologists work independently, or as part of multidisciplinary teams, providing specialist engineering services and technical knowledge enabling patient care.

**All Clinical Engineering Technologists:**

- Communicate effectively with patients, carers and equipment stakeholders
- Conduct safe working practices applying risk management and health and safety principles
- Perform equipment management procedures
- Produce and review incident reports
- Operate medical equipment, performing calibration, equipment quality assurance and equipment quality control
- Carry out equipment acceptance and safety testing
- Perform equipment planned preventative maintenance, equipment configuration and equipment upgrade
- Perform equipment repair in a safe and controlled manner
- Perform assessments, interventions and equipment handovers
- Decommission and dispose of equipment in a safe and appropriate manner
- Perform quality control procedures and review and interpret quality control results
- Specify, design and facilitate the customization of devices
- Teach/train healthcare staff how to operate equipment, use accessories and the correct storage of a range of medical devices and consumables.
- Perform measurements, checks and tests required in order to prescribe or design technology solutions
- Operate quality management systems to include stock and spare part management.
- Maintains appropriate records
- Operate in accordance with Good Scientific Practice

**Medical Engineering Clinical Technologists Specifically:**

- Work with general and specialised medical equipment used in wards, critical care areas, hospital laboratories, outpatient departments and the community
- Ensure medical equipment is enabled, safe and available for use to support diagnosis and treatment
- Perform planned preventative maintenance, fault finding and repair, calibration and safety testing procedures on a wide range of medical devices

**Radiation Engineering Clinical Technologists Specifically:**

- Work within radiotherapy and radiology providing specialist engineering services
- Measure, adjust and quality assure to radiation equipment

- Operate radiation test and measuring equipment
- Understand specific procedures and regulations applicable to working with radiation
- Ensure radiation technology is enabled, safe and available for clinical use
- Works in multi-disciplinary teams optimising and advancing radiation technology

## Rehabilitation Engineering Clinical Technologists Specifically:

- Design, develop and manufacture novel, cost effective assistive devices where commercial options are not available to meet the needs of individuals with disabilities
- Take anthropometric measurements.
- Contribute to patient assessments for assistive devices recommending solutions to meet individual client needs.
- Customise, integrate and install assistive devices to meet individual client needs.

## Renal Engineering Clinical Technologists Specifically:

- Install and work on specialised medical equipment used in wards, critical care areas, the community and other Haemodialysis units located at other hospitals.
- Ensure Renal Replacement equipment is enabled, safe and available for use.
- Perform planned preventative maintenance, fault finding and repair, calibration and safety testing procedures on Renal replacement equipment and specialist water treatment systems.
- Measure and quality control the specialist water used for Haemodialysis.
- Works in multi-disciplinary teams optimising and advancing Renal technology in patient care.
- Quality assure treatment dose or equipment fleet, and assess new equipment meets treatment requirements

## Sonography Scope of Practice

The Society & College of Radiographers (SCoR) (2020) definition of a sonographer is:

*"A healthcare professional who undertakes and reports on diagnostic, screening or interventional ultrasound examinations. They will hold as a minimum qualifications equivalent to a postgraduate certificate or diploma in medical ultrasound, BSc (Hons) clinical ultrasound or an honours degree apprenticeship in clinical ultrasound that has been accredited by the Consortium for the Accreditation of Sonographic Education (CASE). They are either not medically qualified or hold medical qualifications but are not statutorily registered as a doctor in the UK"*[1].

Sonographers independently perform, interpret, analyse and report on screening and diagnostic ultrasound examinations within their scope of practice. They may also perform

interventional diagnostic and therapeutic procedures. When acting autonomously within their area of expertise they have potential to cause harm to patients.

The scope of practice for a sonographer is based closely on the Health and Care Professions Council (HCPC) Standards of Proficiency for Radiographers (2013) and are published in the Consortium for the Accreditation of Sonographic Education (CASE) Standards for Sonographic Education.

Sonographers work independently, or as part of multidisciplinary teams, providing diagnostic ultrasound examinations. They may also undertake diagnostic and/or therapeutic interventional procedures, if this is within their scope of practice.

**Sonographers:**

- Review the clinical request and medical history, appropriately vet requests and obtain valid, informed consent for examinations in accordance with local and national guidelines
- Prepare the patient and environment for ultrasound imaging and/or interventional procedures
- Operate ultrasound equipment safely in line with national and international safety standards
- Independently perform, interpret, analyse and report ultrasound examinations within their scope of practice
- Understand pathological processes, ultrasound appearances, optimal investigations for the diagnosis of pathology across organs and structures within their scope of practice and appropriate referral pathways
- Communicate ultrasound findings clearly and accurately both orally and in a written report
- Work safely, applying risk management, infection prevention and control and health and safety principles
- Reflect on their practice to be responsive to patient and service needs, recognising and respecting individuals' beliefs and decisions
- Work effectively and empathetically with a wide range of service users and carers, and meet core skills required for professional practice
- Critically review the evidence and work to current national standards of practice
- Participate in audit and quality assurance measures to monitor the service and their own standard of practice
- Maintain appropriate records
- Undertake all mandatory training
- Maintain a professional and courteous attitude
- Operate in accordance with the Standards of Proficiency of a Sonographer[3]
- Operate in accordance with Good Scientific Practice[4].

This document sets out the standards of proficiency we consider necessary to protect members of the public. They set out what a student must know, understand and be able to

do by the time they have completed their training, so that they are able to apply to register with us.

## DXA Scope of Practice

Bone Densitometry Technologists/Technicians work independently, or as part of multidisciplinary teams, providing specialist DXA services and technical knowledge enabling patient care.

**Bone Densitometry Technologists/Technicians:**

- Conduct safe working practices applying risk management and health and safety principles
- Produce risk assessments
- Work safely specifically with regard to ionizing radiation hazards in accordance with current legislation
- Produce and review incident reports
- Perform equipment management procedures
- Operate quality management systems
- Use computer systems and software appropriate to their work
- Operate medical equipment, performing calibration, equipment quality assurance and equipment quality control
- Work as, and be entitled in employers procedures under IR(ME)R to act as "Operator" under the requirements of the IR(ME)R regulations
- Perform equipment handovers
- Perform quality control procedures and review and interpret quality control results
- Maintains appropriate records
- Communicate effectively with stakeholders
- Undertakes all mandatory training
- Maintains a professional and courteous attitude
- Operate in accordance with Good Scientific Practice

Imaging procedures

- Perform QC on each day scans are performed
- Prepare the patient and the environment for imaging procedures
- Perform a range of DXA imaging procedures
- Acquire and record data during imaging procedures
- Process the images using appropriate computer software and calculate quantitative results.