

# Quality Control Concepts

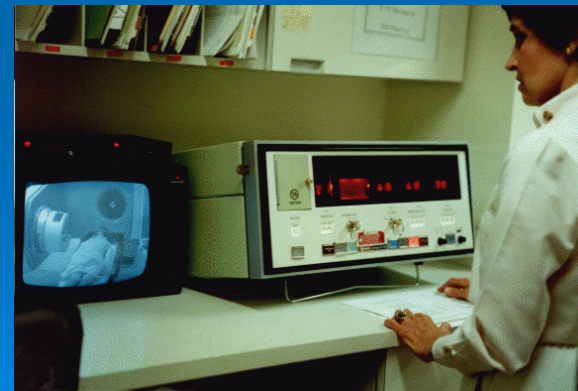
# Quality Assurance

Quality Assurance programs are an integral and necessary part of the operation in any hospital or clinical environment.



# Quality Assurance

The complexity and potential for harm in the everyday duties performed in order to provide therapeutic radiation therapy treatments, requires a sustained commitment to quality assurance in order to function safely.



# Quality Control

Quality Control is part of any quality assurance program.

Quality control is also called:

- quality improvement
- the NRC's quality management requirements

# Quality Control

- . Stryker defined the quality control process in radiation therapy as: “the continuing process by which human errors are detected and evaluated and corrective and preventive measures instituted in all phases of radiotherapy.”



# Quality Control

Quality control procedures not only seek to eliminate human error, they also focus on equipment (hardware and software) performance.

# Quality Control

Quality control procedures are routinely

- Performed
- Documented
- Evaluated

To assure equipment performance is meeting the manufacturer's specifications, departmental policies, and departmental protocols.

# Quality Control

Instrumentation that is used in making quality control checks and meeting regulatory requirements such as calibration equipment (ionization chambers and electrometers), scanning equipment, and dosimetry equipment accessories (solid phantom materials, thermometer, and barometer) must also be tested periodically.

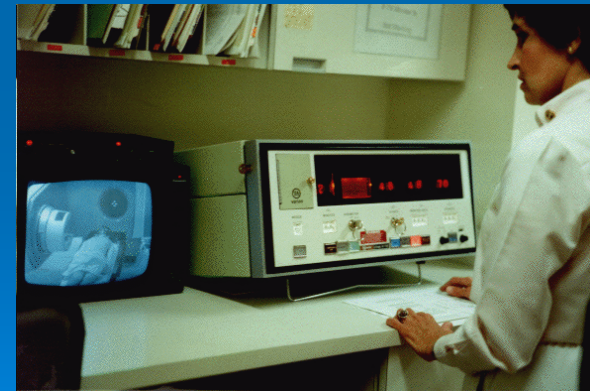


# Quality Control

The electrometers and chambers used to perform calibrations must, in turn, be calibrated every year or every other year by an accredited calibration laboratory.

# Quality Control

The quality control testing schedule for equipment, such as treatment machines, may be determined by federal and/or state regulations



# Quality Control

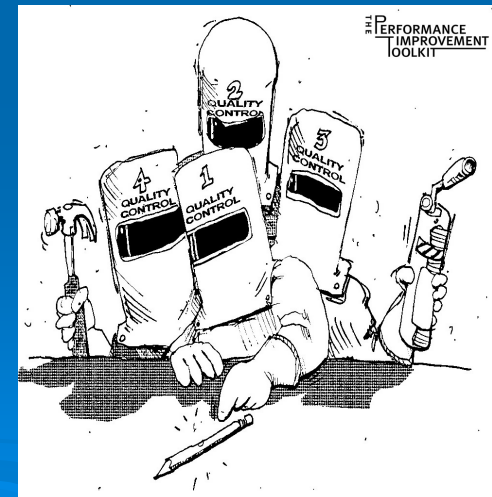
Documentation of quality control testing over a period of time is an important aspect of determining equipment performance. All results must be retained in a manual or digital format along with the actions that were taken to correct deviations beyond the thresholds or limits set in the program.

Essential components of a quality control program for a radiation oncology center are:

- QC is a continuous process and the procedures are performed per the established schedule
- Results of the QC procedures are documented and reviewed so that errors can be detected
- Corrective action and preventive measures are taken once a problem is discovered

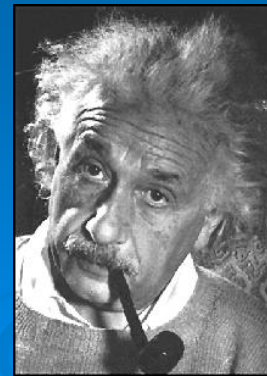
# Action level, Threshold or Limit

An action level is a parameter or reading that when exceeded causes the individual to follow a specific procedure. Quality control procedures are almost always associated with action levels.



# Action level, Threshold or Limit

If the measured rate differs by more than 10% from that predicted by the vendor calibration, the source will be returned. Many action thresholds are set by a regulatory agency; others are set and maintained by the medical physicist at the facility.



# Quality Control

No one single health care professional can perform all the functions required to deliver optimum Quality Control. The members of the Radiation Oncology team each share in the responsibility to deliver a high standard of care to the patient, however, each, by virtue of his or her training and experience, also have a specific role to play in the care of the patient.



The Radiation Oncologist is more often than not is a board certified (in Radiation Oncology) physician that is ultimately responsible for the safety and effectiveness of the care plan for each patient . To be an authorized user the NRC does not require that the Radiation Oncologist is board certified.





**The Medical Physicist is typically highly trained (usually holds a graduate degree) and board certified. The NRC does not require board certification to be an authorized user. His or her mission is to assure that the radiation used during the performance of a radiological procedure is the correct quantity and quality and is applied in a manner that protects the patient and other persons from harmful, excessive or misapplied radiation.**



**The Medical Dosimetrist is responsible for developing the treatment delivery plan for patient. After the plan is approved by the physician and the physicist it is converted into treatment machine settings in preparation for the treatment.**



**The Radiation Therapist (Radiation Therapy Technologist) is licensed in most states to deliver the external beam and brachytherapy radiation treatments.**



The radiation oncology nurse is usually the healthcare professional who responds to patient issues, including monitoring the patient's response to radiation treatments, on a daily basis.



# Quality Assurance

Quality assurance involves the entire department. It includes proper training and licensure of all the persons in the department. Licenses have to be maintained, and that often entails continuing education in the specialized field.



# Quality Assurance

Quality assurance programs involve a long list of quality control procedures, a list of the individuals responsible for each one, and the frequency when they are performed. Some of these are regulatory practices and others are good medical practices.



# Quality Assurance

The most visible aspect of a quality assurance program are the routine quality control procedures performed according to a prescribed schedule. These are performed diligently by therapists, dosimetrists and physicists, day in and day out.