HACKETTSTOWN REGIONAL MEDICAL CENTER
JOAN KNECHEL CANCER CENTER
MEASUREMENT EQUIPMENT

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Effective Date: August 2005	**Policy No: ROC QA 25**
Cross Referenced:	**Origin: Radiation Oncology**
Reviewed Date: 5/09, 12/11, 11/12, 8/13	**Authority: Medical Physicist**
Revised Date: 5/09, 8/13	**Page: 1of 5**

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SCOPE : Department of Radiation Oncology, Medical Physics

DEFINITIONS:

Qualified Medical Physicist - A board certified medical physicist who is qualified to perform QA procedures for linear accelerators and treatment simulators and is registered as such in New Jersey State.

PURPOSE

To ensure all quality assurance equipment meets all State and Federal safety requirements.

POLICY

Quality assurance of Measurement Equipment shall be performed by a qualified Medical Dosimetrist; All measurement equipment used in the department to be calibrated as per TG40 and TG13.

PROCEDURE

1. The Therapist, Qualified Medical Physicist, Manufacturer, Accredited Dosimetry Calibration Laboratory will perform all tests and report findings on appropriate form.

REPORTING FORMS

Multiple – See Attachments

SPECIFIC PROCEDURES

A. QA of Measurement Equipment

1. Ion Chambers/electrometers

Personnel: Qualified Medical Physicist

Procedure:
A Qualified Medical Physicist sends all Ion chambers/electrometers to Accredited Dosimetry Calibration Laboratory for recalibration. Calibration includes:

- NIST traceable calibration
- Linearity
- Venting
- Stem effect
- Recombination correction
- Leakage
- Collective voltage

Frequency:
2 years

Tolerance: Documented

Corrective Action:
Reports filed in Equipment Calibration Log book

2. Phantom materials

Personnel: Qualified Medical Physicist

Procedure:
Solid Water sheets for QA are visually checked for integrity.
Frequency:
Each use

Procedure:
Solid Water is the phantom material of choice for routine monthly QA of linear accelerators. Dose in water is transferred to dose in Solid Water at the time of TG51 calibration for each machine.

Frequency:
Annually

Tolerance: Documented

Corrective Action:
Appropriate thicknesses of phantom material to be used for QA are documented in the Monthly QA forms for each accelerator.

3. Survey Meters

Personnel: Qualified Medical Physicist, Dosimetrist, Trained Radiation Therapist

Procedure:
Prior to use each survey meter is checked for 3 specific items and must pass all three to be utilized:

- Date of lat calibration (not to exceed 1 year)
- Battery check performed by depressing battery check switch
- Reading with a dedicated check source

Frequency:
Each Use

Personnel: Accredited Dosimetry Calibration Laboratory

Procedure:
A Qualified Medical Physicist sends all survey meters to an Accredited Dosimetry Laboratory for recalibration. Calibration includes:

- NIST traceable calibration
- Proper functionality
- Linearity

Frequency:
Annually

Tolerance: Documented

Corrective Action:
Reports filed in Equipment Calibration Log book.

4. Profiler

Personnel: Qualified Medical Physicist

Procedure:
The profiler diode array is calibrated as per manufacturers specifications for each accelerator prior to initial use (see Profiler Manual chapter 4 "Calibrating the diode array"). The profiler is generally used as a relative dosimetry device. During each use, the correct functioning of the diodes is checked by observing the measured profiles. The profiler can also be used as a redundant device for the Daily QA monitoring device. In this case absolute calibration of the central axis diode is performed on an as needed basis.

Frequency:
Initial Use, Each Use, as needed

Tolerance: Documented

Corrective Action:
If a malfunctioning diode is observed the array is recalibrated.

5. Morning Check Devices

Personnel:
Qualified Medical Physicist

Procedure:
The Daily QA_2 is calibrated as per manufacturer's specifications for each accelerator prior to initial use (see Daily QA_2 Manual Chapter 6 "Calibration concepts"). During Annual TG51 calibration for the treatment machine, and immediately after K_{SW} determination, the annual calibration of Daily QA device is performed.

For Daily QA_2 device follow procedure "Daily QA_2 Morning Check Device Recalibrate QA Field Procedure".

Frequency:
Annually, as needed.

Tolerance: Documented

Corrective Action:
Reports filed in appropriate Morning QA check forms.

6. Calipers

Personnel: Qualified Medical Physicist/Dosimetrist

Procedure:
Calipers used to measure patient's distance are checked regularly, since offset errors are not uncommon. Confirm caliper with an independent ruler

Frequency:
Each Use

Tolerance: ±3mm

Corrective Action:
If outside tolerance tighten all screws and repeat measurement. If still out of tolerance the calipers are taken out of service

7. Thermometers

Personnel: Qualified Medical Physicist

Procedure: Calibrated thermometer comes with certificate of use. Redundant check versus independent calibrated thermometer performed prior to initial use.

Frequency:
Initial Use

Tolerance: Documented

Corrective Action:
If out of tolerance remove thermometer from service.

8. Iso-Align Device

Personnel: Qualified Medical Physicist

Procedure: Upon acceptance of device measure: all external markings for accuracy; distance between surface and marker block surfaces to be used for ODI checks; angles, especially 0, 90,180 &270. Perform radiographic tests and measure locations of radiographic markers.

Frequency:

Initial Use.
Tolerance: ±1%
Corrective Action: If out of tolerance remove IsoAlign device from service and alter manufacturer.

REFERENCES:

AAPM TG40 – American Association of Physicists in Medicine Task Group 40 "Comprehensive QA for Radiation Oncology", 1994.