Water or tissue – revisited

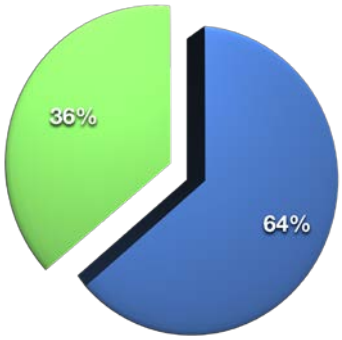
The IROC HOUSTON recently adopted an optically-stimulated luminescence dosimetry (OSLD) system for annual audits of treatment machine calibration. This system replaces the thermoluminescent dosimetry (TLD) system that has been in use at the IROC HOUSTON for more than 35 years. The OSLD system was described in a previous newsletter that can be found here.

At the same time that we introduced the OSLD system, we changed our policy of routinely reporting dose to muscle. As we have explained in the past the IROC HOUSTON has long had a policy of reporting doses measured during our audits (remote and on-site) to muscle.

A review of recent publications such as ICRU report 83 has led us to re-examine this policy, and effective June 1, 2010, we have instituted the following change:

The IROC HOUSTON now reports the dose from OSLD measurements to the same medium as used by the institution for the machine calibration.

TG-51 requires that beam output be measured in water, and many institutions report the calibration that way. In other words, they describe the output as 1.00 cGy/MU to water under reference conditions. However, other institutions apply a 1% correction at the time of calibration, and adjust the treatment unit output to 1.00 cGy/MU to muscle.



The IROC HOUSTON database presently indicates that 36% of participating institutions report their calibration to muscle and the remaining 64% to water.

Annual audit procedures for which the IROC HOUSTON will continue to use TLD include GammaKnife audits, TomoTherapy audits and proton beam audits. For the time being, these measurements will continue to be reported in terms of dose to muscle, except for proton beams, for which doses are reported to water. Only our measurements made with OSLDs are affected immediately by our new policy.

In addition, our reviews of patient treatment records involve an independent recalculation of dose. This recalculation is always reported in terms of dose to muscle because the cooperative study groups, such as RTOG, have asked that all patient doses be reported in terms of dose to tissue. We will continue this policy until the cooperative study groups ask us to change the procedure.

For previous issues of the IROC HOUSTON newsletter, please visit the FAQ page.