

RPC WEBPAGE NEWSLETTER

Volume 5, Issue 3

June 2006

Can I use an ADCL calibration coefficient with a parallel-plate chamber?

Since the publication of the [Task Group 51 Report](#) in 1999, many physicists have switched from TG-21 to the current AAPM protocol (known as "TG-51") and the process has been fairly painless. In fact, as of this writing, 80% of institutions monitored by the RPC have switched to TG-51. Making the transition to a TG-51 calibration for megavoltage photon beams has been accomplished without difficulty at most institutions in the RPC database. However, for electron beams, the change has not been as smooth and uncomplicated as the authors of TG-51 might have hoped.

A problem that is frequently encountered when calibrating electron beams with TG-51 involves the determination of the reference dose rate when a parallel-plate ion chamber is used. We are aware that a number of institutions are using the ADCL-determined dose-to-water ($N_{D,w}$) calibration coefficient. The problem with using the ADCL coefficient is that the k_{ecal} values published in TG-51 are incorrect for some parallel-plate chambers and their use may lead to an error of up to 2½% in the electron beam calibration.

If you use a parallel plate chamber, the AAPM Therapy Physics Committee recommends that you assign an $(N_{D,w})(k_{ecal})$ product based on a cross calibration with an ADCL calibrated cylindrical chamber in a high energy electron beam [see the [TG-39 report](#) (Med. Phys. 21: 1251-1260, 1994)] using worksheet C in the back of the TG-51 protocol. See also the [January/February 2000 AAPM Newsletter](#) for more details. An analysis of this problem was presented at the 2001 AAPM meeting and can be found on the RPC website ([Lowenstein Newsletter article on Practical Considerations](#)). In addition, a review of TG-51 issues, including calibrations with parallel-plate chambers, was published by Taylor, and is available on the RPC website ([Taylor article](#)).

The RPC considers it advisable to obtain an ADCL calibration for comparison, and to satisfy state and local regulations. Recall that the TG-51 protocol specifically advises against the use of parallel plate chambers for photon beams.

Should you have questions, please do not hesitate to contact the RPC at (713) 745-8989 or email at rpc@mdanderson.org.

Previous issues of this Newsletter and answers to many questions can be found at our [FAQ](#) page on our recently updated webpage at <http://rpc.mdanderson.org>.