

RPC WEBPAGE NEWSLETTER

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Are RPC and RDS TLD results equivalent?

As was discussed in last month's newsletter, the Radiological Physics Center (RPC) and Radiation Dosimetry Services (RDS) have a very close relationship. Both units are housed administratively in the Section of Outreach Physics within the Department of Radiation Physics at M. D. Anderson Cancer Center, and both are housed physically in the same building. We use similar equipment and similar procedures for reading and reporting TLD results and a number of staff work in both areas to help assure good communications.

We are occasionally contacted by physicists who have received TLD results from both the RPC and RDS and who believe they have observed a difference in the results. This newsletter is to assure you that there are no differences between the RPC and RDS except those of a statistical nature as a consequence of the uncertainty of the system. We work hard to keep the uncertainties as small as possible.

As one of our periodic quality assurance procedures we irradiate TLD for each other to read and compare the results. These intercomparisons are nominally performed on a quarterly basis and compare results for low and high energy photons and electrons. Three intercomparisons performed since last October compared results for electrons from 6 to 20 MeV and for 6 and 18 MV x-rays. The average ratio of dose predicted by the RPC to that of RDS was 0.999 with a standard deviation of 0.9%. This standard deviation is very similar to the uncertainty of our TLD systems as measured under the best controlled circumstances.

For the results above, the RPC and RDS used the same calibration protocol to determine dose. It is important to remember that for institutions that use the TG-21 calibration protocol, RDS evaluates the results according to TG-21 while the RPC reports the dose in terms of TG-51 regardless of calibration protocol used by the institution. Also, the RPC calculates dose to muscle while RDS calculates to the medium used by the institution. As was described in the earlier newsletter, the RPC policy was established in accordance with a request from the study groups.

The RPC and RDS conduct a regular program of intercomparisons to assure that the procedures and results remain consistent. Each time a new batch of powder is introduced (approximately once a year) a lengthy commissioning process is conducted and results from both groups are compared.

Additionally, the RPC compares results annually with other TLD laboratories throughout the world including the IAEA, the ESTRO-EQUAL laboratory and the Laboratorio de Ciencias in Brazil.

For previous issues of the RPC Newsletter, please visit the [FAQ](#) page.