The UK's National Physical Laboratory has recently introduced the world's first absorbed dose calibration service for electron beam radiotherapy. The Service provides ion chamber calibrations in terms of absorbed dose to water, without reference to air kerma standards, at a range of electron beam energies from 3 to 19 MeV. The Service will give: improved accuracy; a simpler procedure in the hospital; and a beam quality specifier consistent with the newly proposed AAPM code of practice.

Absorbed dose to water is determined in three stages. First, NACP-designed parallel plate reference ionisation chambers are calibrated against the UK primary standard graphite calorimeter in terms of absorbed dose to graphite. Second, the reference chamber calibration is converted into absorbed dose to water, using experimental and Monte Carlo determination of the effective stopping power ratios and perturbation effects. The estimated uncertainty in determining absorbed dose to water is less than 1.5% at a confidence level of approximately 95%: which is a significant improvement over existing dosimetry protocols. Finally the reference chambers, calibrated in absorbed dose to water, are used to calibrate user chambers in a water phantom.

The service will accept any type of device for calibration so long as it is waterproof or has a waterproof sheath. Results of trials of the service for calibrating NACP, Markus, Farmer and Roos designed chambers will be presented.

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