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POLICY STATEMENT

IPEM Recommendations on the Implementation of Codes of Practice

Created by the IPEM Radiotherapy Code of Practice Task & Finish Group

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Background

Codes of practice (COPs) in radiation dosimetry provide standardised and practical methods for the measurement of absorbed dose to water in clinical x-ray or electron beams. They trace a calibration chain from a national or regional standards laboratory through to the clinical unit in the local centre.

For over 70 years, IPEM has taken a leading role in providing these guidelines, in collaboration with the National Physical Laboratory (NPL) who act as the primary standards laboratory [i,ii]. Although international COPs have also been published (e.g. IAEA 2000, 2017 and AAPM TG-51 [iii,iv,v]), the hallmarks of the IPEM/NPL COPs are simpler and more concise protocols. Direct calibration coefficients are provided for the user's ionisation chamber in a range of radiation beam qualities similar to those in clinical use, so generic correction factors for beam quality are not required. This and further advantages relating to the choice of chambers and beam quality specifiers are described in the latest COP for each radiation modality [vi,vii,viii,ix,x].

Role of External Dosimetry Audit

The simplicity and clarity of these IPEM COPs have led to widespread uptake across the UK and nearby regions, and external dosimetry audits over the last 25 years have shown very high levels of consistency and accuracy [xi,xii,xiii]. Collaboration and support through the IPEM inter-departmental audit (IDA) network have also facilitated the roll out of new approaches to calibration dosimetry, and provided assurance to centres during commissioning of new equipment, technology and techniques [xiv,xv].

Therefore, it is recommended that all radiotherapy centres in the UK should participate in a regular programme of routine dosimetry audits from either the IPEM IDA, NPL or Radiotherapy Trials Quality Assurance (RTTQA) groups. Regional IPEM IDA groups feed into the national IPEM IDA who maintain close links with NPL and RTTQA as part of the national Dosimetry Audit Network (DAN), recognised by the IAEA [xvi]. It is recommended that all clinical services should use the IPEM COPs as the standards against which the audit is conducted.

Recommended Approach to Implementation

Local implementation of a certain COP would normally include the formalism and methodology for chamber calibration and the associated correction factors therein. In some cases, particularly where local risks are identified, it may be appropriate to vary some aspects of the guidance or select a certain option based on local equipment, local measurements or historical arrangements. MPEs should perform risk assessments to support these variations in accordance with local governance processes and quality management systems.

When a new COP is released, centres have typically aimed for implementation within 3 years, as recommended by the Medical and Dental Guidance Notes [xvii], in order to maintain consistency and to benefit from the most advanced approaches offered by NPL and wider evidence for best practice. However, it is recognised that there may be practical and risk-based limitations to this for any COP.

Specifically, the 2020 MV COP recommends “isocentric” calibration of treatment units, in order to minimise uncertainties in the calibration chain, rather than the “fixed SSD” setup traditionally used before conformal and IMRT treatments became commonplace. Although many centres already use an isocentric calibration setup, a recent survey showed that about half of UK centres still follow the fixed SSD approach, and widespread concerns were reported about the risk of changing. Therefore, IPEM recommends that the fixed SSD approach (as described in the footnote to Appendix E of the 2020 COP) is an acceptable alternative for those centres who have assessed and documented that the risks and/or costs of changing outweigh the benefits. These centres should still implement the 2020 COP in all other aspects, in order to reflect the current NPL calibration service and best practice for chamber calibration, and will be considered to be fully following that COP rather than any previous versions. Ongoing support will be provided by the regional and national IPEM IDA groups, who can continue to provide independent peer-to-peer audit, taking account of any differences in local calibration conditions.

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