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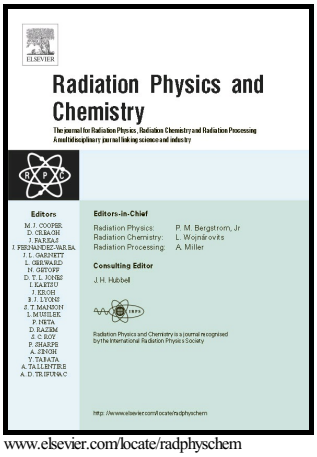

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Dosimetry Audits and Intercomparisons in Radiotherapy: a Malaysian Profile

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Abstract

Quality audits and intercomparisons are greatly important in ensuring control of processes in any system of endeavour. Present interest is in control of dosimetry in teletherapy, there being a need to assess the extent to which there is consistent radiation dose delivery to the patient. In this study we review significant factors that impact upon radiotherapy dosimetry, focusing upon the example situation of radiotherapy delivery in Malaysia, examining existing literatures in support of such efforts. A number of recommendations are made to provide for increased quality assurance and control. In addition to this study, the first level of intercomparison audit i.e. measuring beam output under reference conditions at eight selected Malaysian radiotherapy centres is checked; use being made of 9 μm core diameter Ge-doped silica fibres (Ge-9μm). The results of Malaysian Secondary Standard Dosimetry Laboratory (SSDL) participation in the IAEA/WHO TLD postal dose audit services during the period between 2011 and 2015 will also been discussed. In conclusion, following review of the development of dosimetry audits and the conduct of one such exercise in Malaysia, it is apparent that regular periodic radiotherapy audits and intercomparison programmes should be strongly supported and implemented worldwide. The programmes to-date demonstrates these to be a good indicator of errors and of consistency between centres. A total of eight beams have been checked in eight Malaysian radiotherapy centres. One out of the eight beams checked produced an unacceptable deviation; this was found to be due to unfamiliarity with the irradiation procedures. Prior to a repeat measurement, the mean ratio of measured to quoted dose was found to be 0.99 with standard deviation of 3%. Subsequent to the repeat measurement, the mean distribution was 1.00, and the standard deviation was 1.3%.

Keywords: *Quality audit, intercomparison, radiotherapy, Ge-doped, Malaysia*

1. Introduction

The medical use of radiation and the supporting dosimetry are well understood processes, controlled in accord with established international practices and tolerances. Protocols supporting these continue to evolve in line with the notion of continuing quality improvement. Present interest concerns therapeutic applications and in particular, the accuracy and precision of delivery of the elevated doses that support curative and palliative