P-9-135

Radiotherapy Accidents – Regulations Make a Difference

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Purpose:

To describe the New South Wales legislative requirements for the reporting of radiotherapy accidents and review three serious radiotherapy accidents reported as a consequence of this legislative control.

Background:

The 1993 Regulation under the NSW Radiation Control Act 1990 defined a radiation accident as having occurred for medical purposes if it involved the misuse of radiation apparatus or the maladministration of a radioactive substance. The administration of a therapeutic dose of radiation that differs from the prescribed total treatment dose by more than 10 per cent is a specific radiation accident that must be reported to the Regulatory Authority.

Result:

Three serious radiation accidents were reported during the six years since the regulation has been in force. These radiation accidents occurred at three separate radiation oncology centres each located within major NSW teaching hospitals.

The first serious accident occurred as a result of improper procedures in the method of calculation and documentation and an inadequate method of checking the dosimetry calculations in a newly established radiation oncology centre. The staff were recruited from other radiation oncology centres where responsibility for treatment plan checking was at differing and inconsistent levels.

The second serious accident occurred during a period of absence of the principal treating physician. Poor documentation and communication resulted in the incorrect side of a child's brain receiving treatment. The third serious accident resulted from the same inadequacies as well as poor supervision and implementation of a complex method of treatment using a half beam wedged treatment field. The excessive overdose from this error caused radiation necrosis of the carotid artery and death of the patient.

Conclusion:

The three serious radiation accidents resulted in failure to adequately treat the patient with death as a consequence. Reporting of these accidents as a regulatory control requirement has highlighted deficiencies in the infrastructure and procedures of radiation oncology centres.

The question that arises from the regulatory requirement to report these radiation accidents during radiotherapy treatments is whether these types of radiation accidents commonly occur elsewhere where reporting is not compulsory or are they just an unfortunate cluster of isolated incidents?