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A QUALITY ASSURANCE PROGRAM FOR RADIOTHERAPY CENTERS IN THE REPUBLIC OF KOREA

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Recognizing the importance of quality assurance in radiotherapy and the need to make access to radiation standards traceable to the international measurement system to every radiotherapy center, the KFDA, as a national secondary standard dosimetry laboratory (SSDL), has started a quality assurance program from 1999. This program was initiated by tele-survey to all radiotherapy centers regarding general information about their radiotherapists, medical physicists, type of equipment, dosimeters, etc. This provided the KFDA with a data file and led to links between the KFDA and the clinics.

In 1999 a national quality assurance program for ensuring dosimetry accuracy has been performed by on-site dosimetry for 4 ^{60}Co γ ray, 47 high-energy photon beams used in 43 centers. During the audits, the procedure followed by the KFDA was to measure the outputs of the LINAC(6 MV) and Co-60 teletherapy units in terms of absorbed dose to water for fixed dose(2 Gy) in water phantom (only one phantom used in this on-site visit). For all the case, the measurements are carried out in a water phantom according to the IAEA recommended code of practice [1].

The distributions of deviations in total audit are given in Fig. 1. The results showed deviations varying between −7.11 % and 8.38 %. KFDA follow up the large deviated radiotherapy centers.
The traceability to SSDL is a major factor of deviation between KFDA measurement dose and clinics quoted dose. The correction for air density (temperature and pressure) is a factor that sometimes introduces errors. Most of the clinics do not calibrate their own barometers and sometimes rely on the air pressure that is quoted during measurements by local metrological offices. In one case, the barometer and thermometer of the clinic were deviating from KFDA instruments by about 10 mmHg and 2, respectively even if the temperature was measured in air. In one case, about 4 % of output variation with gantry head angle (horizontal vs. vertical) [2].

In the past two years the KFDA is successful in setting up the postal dose TLD intercomparison program. TL postal dose intercomparison, the method was based on the original IAEA/WHO Program. A Fimel model PCL3 readout system is used for the evaluation.

In first session, there are 5 radiotherapy centers that use a ^{60}Co teletherapy unit participate in TLD intercomparison program. The results of participants satisfy the acceptance limit +/- 5%.

KFDA plan 52 quality audits of high-energy photon beams for radiotherapy centers.

The aim of KFDA quality audit program is to provide radiotherapy centers with external audits in order to ensure that the radiation doses delivered to patient are as close as possible to the prescribed dose. The KFDA was successful in setting up close links with radiotherapy centers.

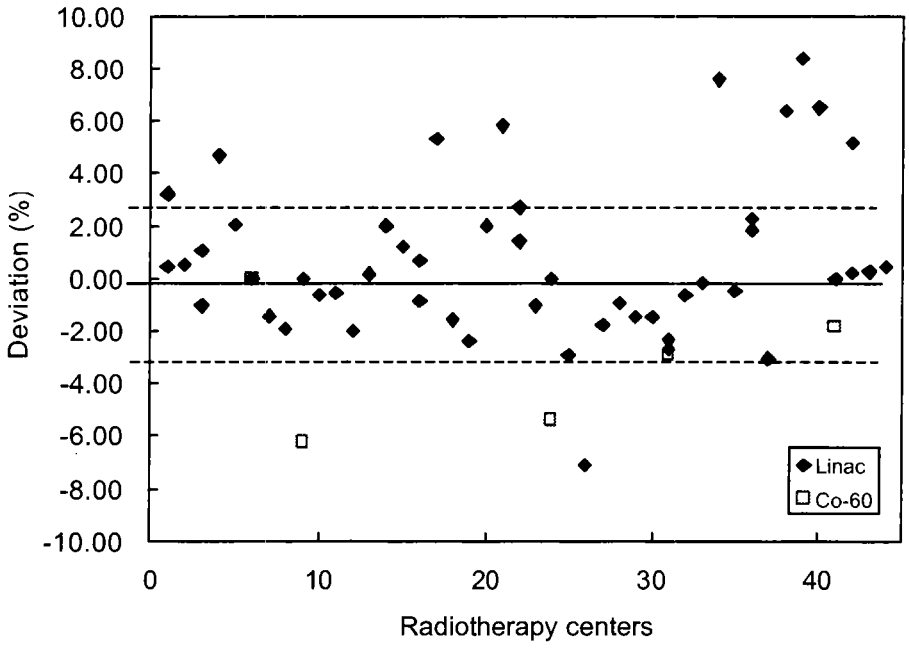

FIG. 1. The distribution of deviation for the dose audits.

REFERENCES

[1] IAEA, International Atomic Energy Agency: Absorbed Dose Determination in Photon and Electron beam: International Code of Practice, Technical Reports Series No. 277, IAEA, Vienna, 1987.

[2] Kim G.Y., Oh H. J., Pyun W.B.: A Quality Assurance Program for Radiotherapy Centers in Korea, Proceedings of a World Congress on Medical Physics and Biomedical Engineering, Chicago, 23-28 July 2000.