Compliance to Diagnostic Reference Levels for radiation exposure in common radiological procedures in Dutch hospitals: A nation-wide survey carried out by medical imaging students

In the Netherlands Diagnostic Reference Levels (DRLs) for radiation exposure have been defined for 11 common radiological procedures. Adherence to these DRLs is an indication of good radiological practice, in which radiation protection is considered important. Average dose values for groups of patients subject to the same procedure should generally remain below the DRL.

However, a study by the Dutch National Institute for Public Health and the Environment (RIVM) showed that many hospitals do not compare their dose estimates to the DRLs according to the national procedure. In many cases Dutch hospitals do not record weights of patients which are needed for a formal comparison to the DRL. RIVM and Inholland University (InhU) of Applied Sciences drafted a plan to remedy this with support from the Ministry of Health Welfare and Sports. It involved students of the Bachelor program Medical Imaging and Radiation Oncology carrying out the formal DRL comparison procedure in the hospitals where they receive their on-the-job training. InhU involved all Dutch applied universities that have a similar bachelor program and a nation-wide project was set up in which radiography students collected dose estimates for radiological procedures in Dutch hospitals on a voluntary and anonymous basis. In this way the participating hospitals were assisted in complying to the DRL-procedure, national dose data were collected and medical imaging students gained hands-on experience with DRL-procedures, which form an important aspect of radiation protection in the radiological practice that they will be involved in after graduating. In practice, students were instructed at the universities of applied sciences and supervised by medical physicists from the participating hospitals.

After a pilot study in 2014 this study was enlarged in 2015 to involve 21 hospitals from all over the Netherlands. In 2016 and 2017 the project was continued in a different set of hospitals. In 2017 the project included a trend analysis of all data collected so far. The obtained dose measurements show very good compliance to the DRLs that may have been enhanced by the voluntary participation. The results indicate that the current DRLs that were not based on a national survey, may need to be updated, sometimes to half their current value. More importantly, this study shows that involving students in DRL comparisons is a viable and instructive approach that is likely to contribute to maintaining radiation protection standards in hospitals in the long term.

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