

12/3020/2016

7 November 2016

TRANSLATION. ORIGINAL TEXT IN FINNISH.

Holders of healthcare safety licence

Reference levels for patient radiation exposure in cone-beam computed tomography examinations of adults' head region

The responsible party's (party running a radiation practice) duty to introduce reference levels for X-ray examinations is laid down in the Decree of the Ministry of Social Affairs and Health on the medical use of radiation (423/2000). The Decree also prescribes that the reference levels for the most common examinations are issued by the Radiation and Nuclear Safety Authority. The provisions concerning reference levels and introducing them into practice are laid down in sections 2, 16 and 17 of the Decree.

This decision provides the reference levels for cone-beam computed tomography (CBCT) examinations of adults' head region. The reference levels are given on the basis of imaging indications.

The table presents the reference levels for patient radiation exposure in cone-beam computed tomography examinations of the head for adults based on different imaging indications. The reference levels are presented as a dose-area product (DAP). The reference levels presented in the tables are based on patient dose collection.

Responsible parties may introduce into practice the reference levels given in the Table or they may use stricter values of their own. When desired, responsible parties may determine reference levels for their own use for examinations which have not been given reference levels.

This decision is valid as of 1 December 2016.

Director General

Petteri Tiippana

Director

Eero Kettunen

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Table. Examinations refer to conventional CBCT examinations conducted with the imaging indication in question.

Imaging indication	DAP mGy·cm²
Presurgical imaging of implant treatments (one tooth)	360
Assessment of the relationship between wisdom tooth and mandibular canal	380
Assessment of tooth's periapical region and root canal morphology	550
Imaging of paranasal sinuses (excluding trauma imaging)	1 150

- Reference Sonja Turnbull-Smith: Cone-beam Computed Tomography Examinations of the Head and Neck Region in Finland: Indications and Patient Radiation Dose
- Appendix Instructions: Reference levels for patient radiation exposure in cone-beam computed tomography examinations of adults' head region

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Reference levels for patient radiation exposure in cone-beam computed tomography examinations of adults' head region

Definition of reference level

Reference level refers to a predetermined X-ray examination radiation dose level that is not presumed to be exceeded in an examination or a procedure performed according to the standards of good practice upon a patient of normal size.

Use of reference levels

Reference levels can be used for detecting X-ray devices and functions that cause exceptionally high radiation exposures. Reference levels are not intended for limiting the radiation exposure of any individual patients but for comparing the average radiation exposure of a group of patients, selected as explained below, to the exposure caused by standard good practice.

If reference levels are exceeded, this does not necessarily mean that the examination has been improperly conducted. Exposures exceeding the reference levels may be expedient to, for example, achieve an image quality which is better than usual. On the other hand, even if no reference levels are exceeded, this does not necessarily mean that the examination has been optimized for radiation safety. It is still necessary to ensure that image quality is sufficient for a reliable diagnosis and that the radiation exposure is not excessive.

Determining radiation exposure

Radiation exposure is measured or calculatory assessed at least every three years. The exposure is determined for the most common examination types of each equipment for which a reference level has been provided. In equipment where imaging parameters are automatically decided according to the patients' size, radiation exposure is measured or calculatory assessed for a group of at least ten male patients of normal size. An average radiation exposure is calculated for this group and compared to the reference level. In equipment where the imaging values are selected manually, the radiation exposure can be determined with the imaging values which would be used in the examination of a male patient of normal size. The radiation exposure shall be redetermined and compared anew to the reference level, if any changes or repairs that affect the radiation exposure are made to the examination procedure or equipment.

For the intermediary years, it is enough to ensure that radiation exposure has not changed and the quality of the images has not reduced.

Assessment of results and corrective measures

The radiation exposure data must be recorded and systematically compared to the reference levels. If reference levels are exceeded, the reason for this must be investigated and all necessary measures must be taken in order to reduce patient exposure.