

# Dent RPA News

## Welcome to Dent RPA News!

Welcome to the latest edition of Dent RPA's periodic newsletter, which aims to inform our customers of relevant developments in radiation protection in dentistry, including new guidance and legislation that might affect you. This edition includes preliminary information about the new radiation protection regulations that will come into force early next year. Dent RPA will endeavour to keep our clients informed as further details emerge and you are encouraged to check our website for up-to-date information

towards the end of the year. It is probable that we will reissue our radiation protection handbooks to reflect any new requirements of the regulators and our online radiation protection training package will be updated in due course in the light of the new regulations.

If you need any more information on any of the articles featured in this newsletter, or if there are other topics you'd like to see featured in future editions, please email us at [news@dentrpa.com](mailto:news@dentrpa.com)

The Dent RPA Ltd Team



### Contents

- 1 Welcome  
*Registration scheme for dental practices Use of Thyroid Collars*
- 2 Diagnostic Reference Levels  
*My Toolbox*
- 3 Dent RPA Ltd publish poster  
*PHE guidance*
- 4 Brexit and the new IRMER  
*Equipment handover process*

## Dental X-ray Equipment Handover Process Required

Dent RPA Ltd would like to remind its clients to ensure that there is a local process in place for ensuring that dental X-ray equipment undergoes formal handover when being taken back from an engineer following service or repair. This is effectively a legal requirement specified in the Health and Safety Executive's document PM77 Third Edition ("Equipment used in connection with medical exposure"). Full details of the handover process and provision of a suitable handover form are given in Section 10.7 of the Dent RPA Radiation Protection Supervisor's handbook. However, following concerns by the HSE over the consistency of handover arrangements for X-ray equipment, it was proposed that an industry standard document be produced which would meet the needs of the HSE and the X-ray equipment suppliers. There were concerns that field service engineers would be reluctant to use a range of different documents where individual customers had created their own interpretation of a handover document.

After a number of meetings between AXREM (a trade association representing the interests of suppliers of diagnostic medical imaging, including all the major X-ray suppliers to the UK market) and the HSE, a consensus was reached on a suitable form. The resultant handover document is now freely available for use by both public and private organisations and can be found at <http://www.axrem.org.uk/wp-content/uploads/2016/07/Handover-Document.pdf>

The form should be instantly recognisable to all dental X-ray service engineers, who should be happy to use it. Dent RPA's customers should note that the AxREM document is very similar to our current form and the version in the Dent RPA Radiation Protection Supervisor's Handbook is still valid. However, customers should be prepared to use the AxREM form where X-ray engineers insist on its use.

## Brexit and the new IRMER

Those of us who are still in shock after the Brexit vote on 23rd June 2016 may be wondering what will happen to the UK government's proposal to introduce revised radiation protection legislation in February 2018. The European Basic Safety Standards for protection against ionising radiation, which resulted in EU Council Directive 2013/59/EURATOM, require EU member states to implement new legislation on radiation safety by early next year, which would result in the repeal of IRR 1999 and IR(ME)

R2000. Despite Theresa May's rhetoric that "Brexit means Brexit", the UK government is already committed to the new radiation safety legislation and the revised equivalents of IRR99 and IRMER will look exactly as they would have, irrespective of the vote to leave the European Union. The new medical exposure legislation is expected to be available for consultation over the coming months and Dent RPA Ltd will keep its clients informed of any relevant changes.

## Use of Thyroid Collars in Dental Radiography

A recent article in the British Dental Journal (Hamilton, et al.) highlighted a proposal by the American Thyroid Association (ATA) to reduce the radiation dose to the thyroid by recommending the use of thyroid collars for all patients undergoing radiology involving the head and neck.

A number of Dent RPA's customers have enquired about the implications for dental radiography. The collective dose in dental radiography is relatively low compared to other imaging modalities. However, the frequency of dental X-ray examinations in the UK exceeds that of any other imaging modality. The thyroid is one of the most radiosensitive organs in the body, especially in children, and therefore the risk of developing a cancer is higher than in adults. Studies have indicated that there may be an increased risk of thyroid cancer, which could be attributed to dental radiography (Memon et al., 2010 & Neta et al., 2013) although the findings are not universally accepted.

There is a general lack of knowledge regarding cone beam tomography radiographic technique and the use of thyroid collars in dental practice. Current UK

and EU guidelines recommend the use of collars for intra-oral radiography only for those very rare examinations where the thyroid is directly in the primary beam. Some have also advocated their use for intra-oral radiography of persons under the age of 30. However, equipment fitted with rectangular collimation will contribute to a comparable or greater reduction thyroid dose with other corresponding dose reduction effects. As such, Dent RPA would strongly advocate the routine use of rectangular collimation in preference to thyroid collars for routine intra-oral radiography. Due to the rarity of dental X-ray examinations involving direct irradiation of the thyroid, Dent RPA do not feel that it is necessary for practices to have a thyroid collar available for such situations.

Users should also note that Dent RPA discourage the use of collars for conventional panoramic radiography as they can interfere with the primary beam contribute to artefacts on the image.

We intend to advise on use of thyroid shielding for cone beam tomography examinations when further research is available.



## Diagnostic Reference Levels for paediatric intra-oral radiography:

In 2012, the Health Protection Agency (now Public Health England) published a review of patient doses across the UK. The HPA report resulted in proposed new national reference doses (NRD) for a wide range of X-ray procedures, which are usually adopted by Employers as their local diagnostic reference level, even before they are formally accepted by the Department of Health (whereupon they become binding). The proposed new NRD for intra-oral radiography is 1.7 mGy for a standard adult mandibular molar setting and 0.7 mGy for a child setting. However, it is the experience of Dent RPA that many of our clients struggle to comply with the child reference level, especially those few practices

still using film. Others RPA's report a similar experience and this is unsurprising as child exposures are typically just 30-40% lower than that of an adult. The HPA acknowledge that their NRD for a child exposure is based on limited data and may not be achievable for all practices. As such, Dent RPA advises its customers not to adopt the new child NRD as the local DRL. A local DRL of 1.2 mGy is proposed for intra-oral radiography of a child. The adult NRD of 1.7 mGy should be adopted in place of the current DRL of 2.3 mGy. Dent RPA technicians will be testing intra-oral X-ray equipment against these proposed DRLs and giving further advice on procedure optimisation where appropriate.

## My Toolbox

Customers are reminded of the wide range of online tools and resources that can be found under My Toolbox in the members' section of the [www.dentrpa.com](http://www.dentrpa.com) website. These have been designed to facilitate the management of radiation protection and can help you ensure that your practice is fully compliant with the requirements of current radiation protection legislation and guidance. Tools provided include a comprehensive quality assurance facility, which allows QA data to be stored and analysed. There is also a Radiation Protection Adviser's audit tool, which provides a detailed report on the status of radiation protection for your practice and gives recommendations for remedial action. It is advised that clients use the RPA audit tool on an annual basis and particularly before an inspection from the Health and Safety Executive or Care Quality Commission. My Toolbox hosts a wide range of advice sheets that cover a number of common scenarios. These can be used to deal with patient and staff concerns about radiation. Under "Resources", you will find a huge library of current guidance documents, letter templates, equipment-specific training forms and other useful material. You can also locate electronic copies of your Handbooks, Local Rules, Equipment Survey Reports and current RPA Contract. In addition, My Toolbox allows you to upload and securely store any other relevant documentation, which can then be accessed from any internet connection.

For more information on what's available, simply log in using your Dent RPA username and password and you will be directed automatically to the Toolbox page.

## Risks from Dental X-rays facts for patients

**Are dental X-rays dangerous?**  
The amount of radiation received from a dental X-ray is usually extremely small. The dose from an X-ray of a single tooth is less than the amount of radiation we receive from natural background sources of radiation every day. A panoramic X-ray of your whole mouth is equivalent to only two days of natural background radiation. A cone beam CT X-ray examination gives a higher dose, which is equivalent to around one month of natural background radiation, but this is considered justified because of the extra clinical information it provides.  
Doses and risks are kept as low as possible with modern X-ray techniques and equipment, and your dentist will take care to only use X-rays only when necessary.

**Why do the staff leave the room during the X-ray?**  
The staff may take hundreds of X-rays every week and they are the amount of radiation they receive by moving away from the X-ray source. However, the risk to individual patients from routine X-rays is extremely small.

**Why wasn't I offered a lead apron or other protection during my X-ray?**  
Research has shown that there is no benefit to low patients resulting from the use of lead aprons or thyroid shields during general dental X-rays, and that these can slightly increase the dose from the procedure. The use of a lead apron may be regarded as prudent for a pregnant (or possibly pregnant) female in the very rare cases where the beam is directed towards her abdomen.

**Should I have an X-ray if I'm pregnant?**  
The dose to the unborn child from a dental X-ray is effectively nil in most situations and the X-ray procedure does not present any risk during pregnancy. As such, your dentist is not normally required to postpone your X-ray until you are pregnant. Very rarely, the X-ray beam may be positioned directly through your abdomen and in such cases your dentist will ensure you are not pregnant or use lead protection over your belly.

**How often can I have an X-ray?**  
There is no limit on the number of X-rays that you can have and your dentist will decide when they are necessary. Your dentist will probably suggest having X-rays if you are a new patient. After that, X-rays may be required every 6 to 24 months, depending on your history of tooth decay, age and the condition of your mouth. UK law requires that X-rays are only taken where there is justification.

**Has do I know my dentist's X-ray equipment is safe?**  
All X-ray equipment is thoroughly tested by qualified technicians at routine intervals. These tests ensure that the equipment is safe, performing to the required standards and that radiation doses are within UK guidelines.

For further information, please contact Dent RPA Ltd at [info@dentrpa.com](mailto:info@dentrpa.com)

## Dent RPA Ltd publish poster on radiation risks

Customers may be interested to learn that we have recently published a poster which is designed to inform patients of the risks from dental X-rays and put these in perspective. The poster aims to allay fears and common misconceptions about radiation exposure in dentistry and we hope that dental practices will display it in waiting areas for the benefit and education of their patients. The poster is available free of charge to all our customers and two copies will be sent by post to each practice with which Dent RPA has a contract.

Please contact [poster@dentrpa.com](mailto:poster@dentrpa.com) to request further copies of the poster or for further information.

## PHE Guidance on the Safe Use of Hand-held Dental X-ray Equipment

The use of intra-oral radiography in dentistry has long been established and traditional intra-oral X-ray equipment is fixed to the wall or ceiling, or is mounted on a mobile stand. In recent years the number of hand-held dental X-ray sets in UK dental practices has increased significantly and a variety of models is available on the market. Public Health England has recently published guidance on the safe use of such equipment as special radiation protection measures are necessary to keep doses to staff comparable to those received from traditional wall-mounted X-ray equipment.

Public Health England (PHE) has tested several models of hand-held dental X-ray equipment currently on the market and found that the radiation protection measures of the different models vary significantly. While the doses received by the operator were in most cases comparable or even lower than those of traditional intra-oral X-ray equipment, the use of some hand-held dental X-ray equipment resulted in doses exceeding statutory dose limits with the possibility of, for example, radiation burns to the hands. PHE has therefore issued a guidance document which contains proposed safety standards for the design and construction of such equipment. Furthermore, the document provides guidance on how to work safely with hand-held dental X-ray equipment.

As the operator is much closer to the

X-ray tube (possible exposure to leakage radiation) and to the patient (exposure to backscattered radiation), the hand-held dental X-ray equipment must have adequate radiation protection measures such as internal tube shielding and for example a backscatter shield to be able to restrict the dose to the operator as far as reasonably practicable. PHE has shown that the use of equipment with a backscatter shield can result in doses to operators which are even lower than from wall-mounted units under certain circumstances.

When buying new hand-held dental X-ray equipment, it must be assured that the dose to the operator is comparable to doses received from the use of wall-mounted devices. Working with hand-held equipment which results in significantly higher doses could imply violation of regulation 8(1) of IRR99. According to PHE guidance, the annual effective dose to the operator should be less than 0.25 mSv.

The PHE guidance document contains a list of requirements which the hand-held dental X-ray equipment should meet, such as:

- Chapter 4 of the Dental Guidance Notes and chapter 9 of IPEM report 91
- Safeguard against unauthorised operation or unintentional exposures
- Sufficient internal shielding and additional permanent shielding (such as a backscatter shield) to meet the dose limits
- Means of quickly and easily stopping an exposure in the case of an accident

The PHE guidance document also includes guidance on the application of IRR99 when working with such equipment. This includes the need to notify HSE if the hand-held equipment is used at other premises (e.g. care homes).

With the use of hand-held dental X-ray sets in dental practices being only a recent development, it is important to seek advice of a suitable RPA at the appropriate time before buying or using such equipment. Please contact Dent RPA ([info@dentrpa.com](mailto:info@dentrpa.com)) if you require further advice.



The full PHE guidance document can be downloaded from <https://www.gov.uk/government/publications/hand-held-dental-x-ray-equipment-guidance-on-safe-use>