# Template - Radiation Management Plan - Dental X-ray

# May 2022

## Introduction

It is a requirement to submit a Radiation Management Plan (RMP) to obtain a licence to possess and use radiation sources under the *Radiation Protection Act*. The RMP must be updated from time to time as required. Information that is required on RMP is outlined under Regulation 9 of the Radiation Protection Regulations 2016.

The purpose of the RMP is to assist licence holders or responsible person to manage dental diagnostic imaging in accordance with the *Code of Practice and Safety Guide – Radiation Protection in Dentistry*, RPS 10, ARPANSA (2005) and International Best Practice.

This Radiation Management Plan has been prepared for NAME OF LICENCE HOLDER (PERSON OR COMPANY), holder of the licence L/XXXXXX to possess radiation source(s), at the location(s) named below, for the practice of Diagnostic and Interventional Radiology:

|  |  |
| --- | --- |
| Approved Premises Number | Physical Address |
|  |  |
|  |  |

RMP must be read and understood by all relevant staff involved with the dental radiology in a practice.

### Statement of acceptance of this plan

This radiation management plan was prepared by NAME on DD/MM/20YY

Contact details: telephone: XXX XXXX email: XXXXXXX

The holder of licence L/XXXXXX hereby agrees to adhere to all requirements in this plan.

Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Licence holder or person authorised to sign for the licence holder)

Date: DD/MM/20YY

Date for review of this plan: DD/MM/20YY

## Details of the Radiation Management Plan (RMP)

### (a) a brief description of the type and scope of the radiation practice.

The practice of dental imaging using intra oral, Orthopantomography (OPG, Cone Beam CT(CBCT) and Cephalometric imaging systems.

The practice employs dentists, dental hygienists, dental assistants, and dental nurses to use dental x-ray equipment who are authorized under L/XXXXXX.

The use of dental X-ray equipment is subjected to regular Quality Assurance Program (as recommended by the Department of Health), and Compliance testing by appropriately qualified and authorized personal.

All diagnostic imaging is justified and optimized as required by the *Code of practice and Safety Guide for Radiation Protection in Dentistry, RPS 10 (ARPANSA, 2005)*.

### (b) a list of the radiation sources dealt with in the radiation practice.

* As per Schedule 1 Part A of the radiation licence L/XXXXXX.
* A list inventory of dental x-ray equipment is also attached in the Appendix.

### (c) an assessment of the potential hazards from the radiation sources dealt with in the radiation practice.

Image receptors and patient may absorb up to 90% of the primary beam from the intra oral equipment. However, OPG and CBCT may produce significant scattered radiation from the patient and due to the leakage from the tube head.

OPG and CBCT room has additional shielding to minimize radiation dose to staff and member of the public.

### (d) details of the environment likely to be exposed to radiation during the radiation practice.

* individual rooms in which the x-ray units are located
* adjacent rooms to those above
* areas immediately outside any external walls of the x-ray rooms

Shielding assessment has been carried out to ensure exposure radiation dose to member of public and staff is within the prescribed dose limit.

### (e) the radiation principles, work practices (including quality-assurance procedures) and equipment (including personal radiation monitors) used to ensure that radiation exposure of persons or the environment is as low as is reasonably achievable during typical types of work carried out within the radiation practice.

Justification – All x-ray examinations is prescribed depending on the history and clinical indication of the patient. Routine radiography is not performed unless if deemed necessary by Dental Practitioner.

* Dental x-ray examination is based upon consideration of the prevalence of diseases, their rates of progression and the diagnostic accuracy of the imaging techniques.
* Practice has developed referral criteria for clinical conditions for which Intra oral, OPG and Cephalometric images may be taken.
* The practice has also adopted the Department of Health Referral Criteria for clinical conditions for which dental CBCT scans may be required.
* CBCT images are not taken for circumstances where intra oral and OPG may provide adequate diagnostic information.
* Patient may be referred to external provider for OPG and CBCT scans. In these instances, Dental Practitioners are required to provide sufficient clinical information based on patient history and clinical examination, to ensure appropriate justification process takes place before imaging.
* Records of imaging prescription and reports are kept within patient folder(s) for at least 7 years.

Following information are obtained and kept in the patient folder:

* + Patient name and date of birth
  + Clinical indication for the examination
  + Requested dental x-ray examination: intra oral, OPG, CBCT and Cephalometry.
  + Date of request
  + Signature, electronic signature, or another mechanism of authentication,
* Practice has adopted the Department of Health recommendation to carry out Quality Assurance program for Dental x-ray equipment.
* Records of QA tests are kept and available for view.
* Personal monitoring is carried out only for dental practitioners who uses OPG and CBCT. However, personal radiation monitors are provided to pregnant staff or anyone else within the practice who would like to monitor their radiation dose for a period of at least 12 months.
* Repeat analysis of x-ray is undertaken once in every 12 months as part of feedback and continuous improvement.

### (f) Details of particular classes of persons that may to be exposed to radiation during the radiation practice.

#### Children

* X-rays are taken only when required based on the history and clinical conditions of the children. Routine radiography is not carried out.
* Exposure factors optimized for children to obtain adequate image quality and optimizing radiation dose to children.
* Imaging protocols for children are optimized by using lower exposure factors which may provide adequate diagnostic information.
* CBCT images is only taken when clinically necessary.

#### Pregnant women

* Pregnant women may be safely exposed to intra oral, OPG, CBCT and Cephalometric scans without additional precaution.
* A pregnant staff member may operate the x-ray equipment but must wear personal radiation monitoring badge for the duration of the pregnancy.

#### Volunteers in biomedical research

* Not applicable; OR
* Volunteers may be exposed to X-ray radiation if the research project complies with the requirements of Code of Practice “Exposure of Humans to Ionizing Radiation for Research purposes”, (RPS 8, ARPANSA 2005)

#### Persons exempt from requiring an authorization to use Dental X-ray equipment

* Students studying ‘Certificate IV in Dental Assisting “while undertaking a supervised clinical placement as part of their studies.

#### Other persons:

* Although rare in dental radiography, carers who may need to hold children during x-ray must wear lead aprons to reduce unnecessary radiation exposure.

### (g) The maximum dose of radiation it is anticipated a person of a class of persons specified above will receive while the radiation principles, work practices and equipment referred to in paragraph (e) are being used, and the action to be taken if those doses are exceeded

* Unless requested by the Dental Practitioner, personal monitoring is generally not required to operate intra oral x-ray equipment.
* Personal monitoring is carried out for dental practitioners who operate OPG and CBCT.
* Dose Constraint (maximum anticipated radiation dose) to dental practitioner who operate OPG and CBCT, is expected to be less than 250 µSv for a period of 3 months.
* Investigation will be carried out if dose constraint (250 µSv) consistently exceeds for a period of 12 months.

### (h) details of a course of study or training that –

1. is being or will be undertaken by a person who is expected to be dealing with a radiation source in the radiation practice; and
2. requires, as part of that course of study or training, the person to deal with the radiation source in the radiation practice.

* Dental X-ray equipment is used by appropriately licensed Dental Practitioner or Specialist Dentist.
* Students studying Certificate IV in Dental Assisting is supervised by Senior Dentist during clinical placement.
* The ‘USE’ of equipment is restricted to the scope of training and license conditions for each individual.

### (i) the name, qualifications, and experience of the supervisor of a person referred to in paragraph 9-2(h)(i) while undertaking that part of a course of study or training referred to in paragraph 9-2(h)(ii)

Dental assistants who are undertaking Certificate IV are supervised by a Senior Dentist or experienced dental practitioner during clinical placement.

### (j) The training and information to be provided to persons involved in carrying out the radiation practice

* The approved RMP is available to all staff to ensure that they understand the requirement to comply in accordance with this RMP and licence conditions.
* Dental Assistants has completed an approved training course.

### (k) The name and contact details of the radiation safety officer for the radiation practice

Radiation Safety Officer (RSO) will be responsible for the day-to-day radiation safety within the dental practice.

The RSO may be:

* Principal or Senior Dentist; or
* an experienced radiographer.

### (l) A description of the role of the radiation safety officer

* Assist licence holder to fulfill their duties under section 2.1.4 of the Dental Code (RPS 10).
* Development, Implementation, and review of the Radiation Management Plan
* To develop protocols and policies to carry out justification and optimization of dose patients and staff member.
* Assist licence holder to carry out regular Quality Assurance of Dental x-ray equipment as recommended by the Department of Health.
* Provide appropriate personal radiation monitors to staff and maintain occupational exposure records.
* Conduct investigations in the event of a radiation incident and provide advice to licence holder and the Director of Public Health.

### (m) A description of the resources available to the radiation safety officer to enable him or her to perform his or her role under the radiation management plan

* Funding is available to carry out compliance testing and personal monitoring.
* Funding available to purchase equipment to carry out regular Quality Assurance.

### (n) A description of the roles and responsibilities, that are relevant to a dealing with the radiation source in the radiation practice, of all persons authorised by the licence to deal with the radiation source in the radiation practice

An internal document is available that details the roles and responsibilities of all individuals involved in the practice, including:

* The licence holder (or the responsible person) has the ultimate responsibility to ensure safe operation of a diagnostic (interventional) Imaging department (practice).
* The licence holder (or responsible person) has a responsibility to adopt, implement and maintain Quality Assurance for each modality at defined intervals as recommended by DOH. Records of QA documents are kept for the operational life of the equipment.
* All staff are responsible for following the radiation practices specified in this plan.
* All staff are to report to the RSO any matter that may compromise radiation safety

### (o) The methods used to ensure that the persons referred to in paragraph (n) are aware of their obligations under the Act and the licence

* Radiation safety awareness training during induction for new employees which includes overview of the RMP and licence conditions.
* RMP is available to all staff to ensure that they comply with the requirement of the RMP.
* RMP review takes place at least once in every 3 years with collaboration between team member such as Dentist, Dental Hygienist, Dental Therapist and Dental Assistants
* Internal audit is undertaken once in every 12 months to check compliance against licence conditions and RMP.

### (p) Details of how the radiation source in the radiation practice will be prepared for use, repaired, maintained, transported, stored and disposed of

* Quality Assurance programme is in place for each x-ray equipment as per the DOH Guideline. Records of QA tests are kept for the operational life of the equipment.
* Compliance tests are carried out in accordance with the requirements of the Radiation Protection Regulations, as updated from time to time.
* All x-ray units will be disposed of in accordance with the requirement of the Radiation Protection Act, and after obtaining appropriate approval from the Director of Public Health.
* Sell (or transfer of ownership) of any equipment will take place in accordance with the requirement of the Radiation Protection Act, and after obtaining appropriate approval from the Director of Public Health.

### (q) Details of any emergency response plans for the radiation practice including reporting to the Director of Public Health

* Protocols have been developed and are available to deal with incidents involving unexpected irradiation of any person.
* Director of Public Health (DPH) will be informed of any malfunction of an x-ray unit that could have resulted in unexpected irradiation of any person or of any situation where a person could have been exposed inadvertently by completing the radiation incident reporting form.
* Radiation incidents will be reported in accordance with Department of Health Guidelines.

### (r) Details of procedures that are designed to minimise the radiation hazard arising from a radiation incident

See protocols above.

### (s) Details of reporting procedures for incidents adversely affecting, or likely to adversely affect –

1. equipment used in the radiation practice; or
2. the environment; or
3. the health or safety of any person

* Staff required to report any malfunction of the x-ray unit/observed damage to unit (e.g., frayed cords, dents in tube casing) to RSO immediately.
* Any other incident also to be reported to RSO who will take immediate action and inform licence holder for any further investigation and action.
* RSO will report the radiation incident to the Director of Public Health by completing the radiation incident reporting form.

### (t) Details of record-keeping requirements including details of the records that will be kept of movement of any mobile radiation source in the radiation practice

Protocol for maintenance of records has been developed and is available. This includes that records of all radiographs will be maintained for at least seven years.

* Records of Quality Assurance tests are kept for each x-ray equipment and are available for the operational life of the equipment.
* Records of disposal of all units will be maintained as per Regulation 30, *Radiation Protection Regulations 2016.*

### (u) Details of the use of radiation warning signs and labels in the radiation practice.

* Warning labels on the x-ray units and on room entrances, as required in the certificate(s) of registration.
* Visible Radiation warning signs at any general access point to a room used for dental x-ray equipment.

### Referenced documents:

* RPS 10, *Code of Practice and Safety Guide for Radiation Protection in Dentistry*, ARPANSA (2005)
* RPS C-1, R*adiation Protection in Planned Exposure Situations,* ARPANSA (2019)
* RPS 8, *Code of Practice for the Exposure of Humans to Ionizing Radiation for Research Purposes* (2005), ARPANSA (2005)
* *Radiation Protection Regulations 2016*
* *Radiation Protection Act 2005*