



Review of Victorian Radiation Safety Legislation

**Submission To
Department Of Human Services
By Australian Dental Association
Victorian Branch Inc.
March 2004**



2 March 2004

Ms Jenny Morris
Legislation and Policy Officer
Legislation Review, Public Health
Department of Human Services
GPO Box 1670N
Melbourne Victoria 3001

By email: jenny.morris@dhs.vic.gov.au

Dear Ms Morris,

Review of Victorian radiation safety legislation

As the peak organisation for dentists in Victoria, the ADAV is pleased to make this submission in response to the Review of Victoria Radiation Safety legislation.

Dentists, dental therapists and dental hygienists rely on good radiographs for effective treatment of dental patients, and the safety of patients and practitioners is a primary concern of the ADAVB. We therefore support the continued operation of the Radiation Safety Act and Regulations.

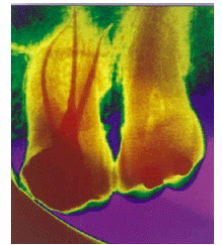
Comments on aspects of the operation of the Act and Regulations are detailed in the attached submission. These comments are focussed on only those questions or issues which are of particular concern to the dental profession.

Yours sincerely

A handwritten signature in blue ink that reads 'G Pearson'. The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Garry Pearson
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Review of Victorian radiation safety legislation

As the professional association representing over 90% of Victoria's dentists, the Australian Dental Association Victorian Branch Inc. (ADAVB) is pleased to respond to the invitation to offer comments on the review of Victorian radiation safety legislation.

On the whole, the existing legislation appears to be satisfactory, however, there is room for improvement. The most important issue from a practical point of view is that of the role of dental assistants in dental radiography. Other issues are:

- the question as to whether dentists need licenses to possess and licenses to operate dental X-ray equipment;
- the role of the Dental Practice Board of Victoria (DBPV) and
- the lack of uniformity of regulations.

Issue

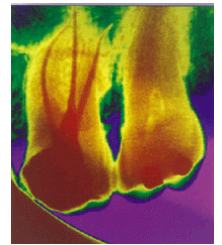
Section reference

18 *Which registered health practitioners should also be required to hold a licence to use radiation apparatus?* **4.3.6**

The role of dental assistants in dental radiography needs to be defined.

Firstly, the present situation, in which dental assistants are not allowed to initiate the exposure by activating the exposure button, is totally out of step with the present role of dental assistants. Given the requirements of modern infection control procedures in dental practice, having examined the patient and set up the film and aligned the tube, the dentist or operative auxiliary needs to be able to remain gloved, and to resume their treatment of the patient after exposure with the minimum turn-around time. It should therefore be possible for a dental assistant to initiate the exposure upon the direct instruction of the licensed operator (dentist, therapist or hygienist) who has personally attended to all the key requirements they are licensed to observe.

Secondly, it is becoming increasingly difficult to attract medical radiographers to staff radiology departments in dental hospitals. In other States this problem has been dealt with by establishing training courses in dental radiography for dental assistants. It should therefore be possible for dental assistants who have completed an approved course of training, or those holding a licence from an interstate statutory body to undertake dental radiography in that State, to be licensed to take intra-oral dental radiographs in Victoria.



Radiographic activities of dental assistants should be restricted to taking intra-oral radiographs on prescription and under supervision only. This arrangement would also be advantageous for dentists in private practice and it would be an interesting career move for dental assistants.

The levels of training in dental radiography vary for Dental Therapists and Dental Hygienists who have completed different courses around Australia. Licensing should therefore be compulsory, and individuals seeking licenses must be able to prove that they have had adequate training.

19 *In particular, should dentists be exempted from the requirement to be licensed to perform dental radiography?* 4.3.7

The ADA is in favour of prescribing maximum levels of exposure or dose limits in regulations, standards and codes of practice. However, there should be consideration given to the fact that routine exposure to dental radiography does not give rise to exposure levels of significant risk to the community. The gonad dose for dental radiography is minimal, being 0.003% of annual background exposure. (Refer Appendices 1 and 2).

Although the dose to the individual patient per dental radiograph is not high, the number of dental radiographs taken is substantial. A recent estimation by ARPANSA is that 10 million intraoral radiographs and half a million OPGs are taken per year in Australia. Consequently, the need for compliance by the dental profession with the ALARA principle is essential.

Dentists trained in Victoria have adequate training at an undergraduate level to undertake all forms of intra-oral radiological examinations, and the ADAVB therefore believes that their obligation to practice effective radiation hygiene simply needs to be reinforced. This is motivated both by concern for patient welfare, with all patients properly protected with a lead apron and thyroid shield, and for the staff who may be continually exposed.

It is not appropriate however, to have a further licence for activities in which a practitioner has already been trained and registered, unless it can be demonstrated that there are ongoing complexities which need further training – and even then this should be a registration Board requirement. Obviously, the ADAVB has no disagreement with the need for radiation hygiene, but this is already well addressed within the scientific training of dentists. A copy of the Federal ADA submission to ARPANSA expressing similar views is provided at Appendix 3.

This is a separate matter from licensing of equipment, and ensuring that routine testing and servicing are undertaken. These measures are supported.



The register of dentists would simply need to be kept up to date within the secretariat for the equipment licensing body, so that all dentists receive the same newsletters and update information as others licensed to operate x-ray equipment.

21 *Should the Dental Practice Board have sole jurisdiction over the use of radiation apparatus by dentists and, if so, how are common radiation health and safety standards to be enforced consistently for registered health professions?* 4.3.7

It is clear that the ideal situation would be that registration with the DPBV would allow the registered dentist to practise dentistry in its entirety without the need for additional licenses.

Dentists do object to paying extra license fees, which they see as double taxation when they already pay registration fees for the regulation of their practice.

22 *What radiation apparatus or radioactive sources should be required to be registered under radiation safety legislation?* 4.3.9

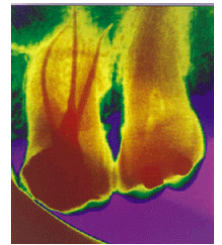
Dental intra-oral x-ray machines should all be registered and subject to testing from time to time, particularly as they become older. The tube in the machine wears, causing the focal spot to become larger and contributing to an increase in radiation scatter, and deterioration in the quality of the image. The mechanics of the arms of the apparatus is also subject to wear causing movement artefact, and the subsequent necessity to retake films and so expose patients, and potentially staff, to further radiation doses.

The testing cycle could be annually after the equipment reaches say 5 years of age.

Whilst it is sensible to have regular testing, there should not be a license fee per machine, as testing is not done annually. When it is done then multiple machine practices should be charged at a lower rate than one-machine practices, assuming part of the fee is for travelling to the practice. Licensing of machines should not be a revenue raising method – but there is a risk that this may occur (if it hasn't already).

27 *For what period should equipment be registered?* 4.3.12

For as long as the equipment meets requirements as assessed by the testing protocols set within the relevant standard.



35 *How should the National Directory be made part of Victorian law, and what requirements for scrutiny and public notification should be imposed?* **4.7.2**

It is regrettable that at this point in time there is no national uniformity of radiation safety regulations in Australia. For instance, it is an anomaly that radiography licenses for dentists vary greatly between the various jurisdictions.

Some jurisdictions require no license for dentists at all, some automatically license every dentist registered with the relevant Dental Board for the full scope of dental radiography whereas others restrict dentists to only certain types of dental radiography. A similar anomaly exists in the different roles in radiography of dental assistants in various States; see also the comment under issue 18.

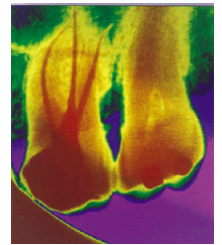
It is therefore vital that the proposed National Directory will be part of the Victorian legislation. Compliance with national Codes of Practice should be a condition of granting licenses to possess, licenses to operate and licenses to install and maintain dental X-ray equipment. If this became implemented with adequate Codes of Practice, different State regulations would be unnecessary.

As for any regulatory measure that will impose costs on the community, Regulatory Impact Statement processes should apply.

45 *Should the Secretary have power to pass information of breaches to other bodies and, if so, to which bodies and in what circumstances?* **5.2**

The fragmentation of responsibilities (ref. issue 21) makes it necessary that communication occurs regarding the suspension of licenses or registration between the statutory body issuing licenses and the DPBV, and vice versa.





- 64 *What are your views on the application of the Victorian model for health practitioner registration to medical radiation technologists? You may wish to comment on particular aspects of the model and their application to medical radiation technologists, eg.* 7.5.4.6
- *How should the MRT Board be empowered to deal with poorly performing medical radiation technologists?*
 - *Should there be mandatory CPD for medical radiation technologists?*
 - *Should there be provision for performance assessments and performance reviews?*

All registered health professions should be subject to common core provisions as per the Victorian Model for health practitioner registration. There are likely to be special factors in each of the health service areas however, that require some variation on the model.

There seems little point in having a registration board unless they are empowered to deal with poorly performing registrants.

The ADAVB has seen no evidence of the effectiveness of universal mandatory CPD, and suggests that such measures should only be required of particular registrants who show signs of performance problems that could be overcome through participation in further education.

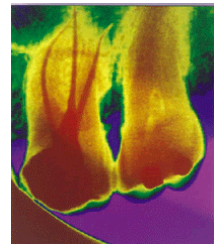
The performance pathways model already introduced under the Medical Practice Act is suitable for all health practitioners, including medical radiation technologists.

A similar situation obtains to the work of the MRT Board as applies to the Traditional Chinese Medicine Registration Board, in that policy matters considered by them have potential impact across other registered health professions. To that extent, liaison mechanisms need to be established to ensure that other registration boards remain in touch with policy and code developments sponsored by the MRT Board, with relevant measures adopted consistently by all affected boards.

See also an Information Sheet on Equipment Maintenance published by the ADAVB for member reference in 2000, and a draft Radiation Management Plan, offered for member adaptation, following the Appendices.

Acknowledgements

The ADAVB expresses its appreciation to Dr Johannes Keur and Dr Pamela Craig, both of whom are recognised experts in dental radiography, for their advice in the preparation of this submission.



Appendix 1 Extract: The Source, Issue No. 14 November 2003, National Radiation Laboratory, NZ (http://www.nrl.moh.govt.nz/The%20Source_Issue%2014_Nov%202003.pdf)

Dental drill: What is an acceptable exposure time in intra-oral radiography?

The last few articles in Dental Drill have discussed some of the factors that influence the image quality versus patient dose relationship. A crude "litmus test" for whether a given dental intra-oral x-ray system and film processing is satisfactory is whether the exposure time for an x-ray examination is in an acceptable range.

What does changing the time do?

Intra-oral x-ray units in New Zealand have very few "knobs" or settings that can be changed. The kVp is fixed in most units, as is the mA (tube current), but the exposure time can be varied either directly by selecting the value of the time required or indirectly by selecting the icon or icons (tooth symbol, patient size, etc) required. Changing the time simply changes the number of x-rays being produced – for example, doubling the exposure time doubles the number of x-rays.

What determines the exposure time needed?

Many factors affect the exposure time needed:

The kVp of the machine, together with its waveform and filtration, determines the penetrating properties of the x-ray beam – the higher the kVp, the more penetrating the beam, and hence the need for fewer incident x-rays. X-ray units operating at 70 kVp should require shorter exposure times than units operating at, say, 50 kVp.

The tube current of an intra-oral x-ray unit is typically in the range of 7 to 15 mA, but the value depends on the specific make and model. The higher the tube current, the higher the x-ray output, and this should mean the shorter the exposure time.

The focus-to-skin distance (discussed in *The Source*, Issue 11) also affects the exposure time required. While a longer focus-to-skin distance (200 mm) is strongly recommended, it can lead to longer exposure times compared with a short focus-to-skin distance (100 mm).

Film speed is another factor influencing exposure time. It would be expected that the use of E or F speed film would result in exposure times about one-half of those for D speed film, all other factors being equal.

The density of the resulting image depends on the number of x-rays reaching the film – the more x-rays, the darker the film. All films have a characteristic curve of similar shape to that shown in the accompanying diagram. The aim with all exposures is to obtain image densities, for the anatomy of interest, that lie in the so-called linear region of the curve. Or to put it another way, images with average densities in either the toe region or the shoulder region are to be avoided if good contrast is to be obtained in the image. There is some latitude within the linear region, and personal preferences often dictate whether images have high or low average optical density. Higher densities do require more radiation and hence longer exposure times.

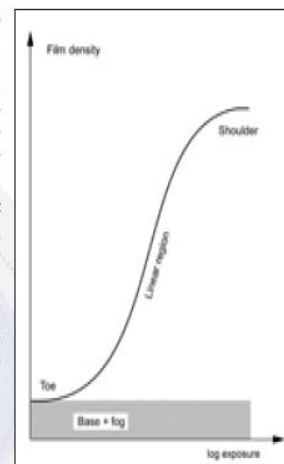
The final major factor influencing exposure time is the film processing. The importance of processing cannot be over-stated, as discussed in *The Source*, Issue 8. If the processing is not correct, due to spent chemicals, incorrect temperature, incorrect development time or "sight" development, etc, then it is more than likely that lengthened exposure times are being used in an attempt to compensate for the processing deficiencies.

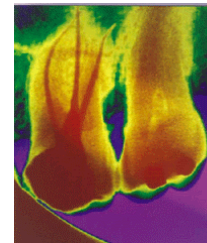
Then there is the practical issue of what timer settings are available for selection. This will depend, in the first instance, on the waveform of the generator and the method of controlling the timing. Single pulse self-rectified units usually have a shortest available exposure time of about 0.1 seconds, while constant potential units may offer exposure times as low as a few milliseconds. Some clockwork timers are still in use, and these typically can set times down to only about one-quarter of a second.

What is an acceptable exposure time?

As a starting premise exposure times should be as short as possible. The main reason for this is to minimise the chance of patient movement during the exposure as any motion will result in loss of sharpness in the image. The NRL *Code of safe practice for the use of x-rays in dentistry*, NRL C7, gives 1 second as the maximum recommended exposure time, but under normal circumstances exposure times for all types of intra-oral radiography should be able to be less than 0.7 seconds for D speed film systems, and less than 0.5 seconds for E speed film systems. Digital systems should be able to use exposures that are less than for E speed systems. The actual value will obviously depend on the interplay of the factors discussed above. As a starting point for a new or changed x-ray system, the x-ray unit's owners manual and film or digital receptor manufacturer should give guidelines for exposure times.

For more information contact John Le Heron (John_Le_Heron@nrl.moh.govt.nz).





Appendix 2 Extract: The Source, Issue No 7, September 2001, National Radiation Laboratory, NZ (<http://www.nrl.moh.govt.nz/Sept2001Source7.pdf>)

Dental drill: doses to patients III

The previous two issues introduced entrance surface dose as the measure of the amount of radiation incident upon the dental patient and equivalent dose as a measure of how much radiation is absorbed by a given organ or tissue. In this final article on patient doses a third dose quantity is introduced.

Effective dose

To properly describe "the dose" from a dental x-ray you need to take account of all the equivalent doses to the various tissues and organs in the body. Obviously this is difficult as it involves a large number of tissues and organs with widely varying equivalent doses. A third type of dose is used for this purpose – namely, effective dose. Effective dose is the equivalent uniform whole body dose that would produce the same ensuing radiation harm (cancers and hereditary effects) as the actual dose distribution in the body. Calculation of effective dose takes into account not only the equivalent doses to particular tissues and organs but also their relative radiosensitivities. The unit for effective dose is the sievert (Sv).

The use of effective dose for a bitewing x-ray, for example, enables a single value to characterise the x-ray exposure rather than specifying a whole lot of equivalent doses to various tissues. This single number can then be used to estimate the risk of radiation harm. It may seem odd to convert a head-region exposure into a whole body exposure, but most of the radiosensitive tissues are in the trunk and it is the doses to these tissues that effectively determine the likelihood of radiation harm.

Typical patient effective doses for dental x-ray examinations are in the range of 2 to 20 μ Sv for a pair of bitewings and 5 to 20 μ Sv for a panoramic film. In other words, the actual doses from a pair of bitewings has the same effect as if the whole body (and hence every organ and tissue in the body) received an equivalent dose of 2 to 20 μ Sv. The wide range of doses for the same examination arises because there are a large number of technical and technique factors that affect patient effective dose. These will be discussed in future articles.

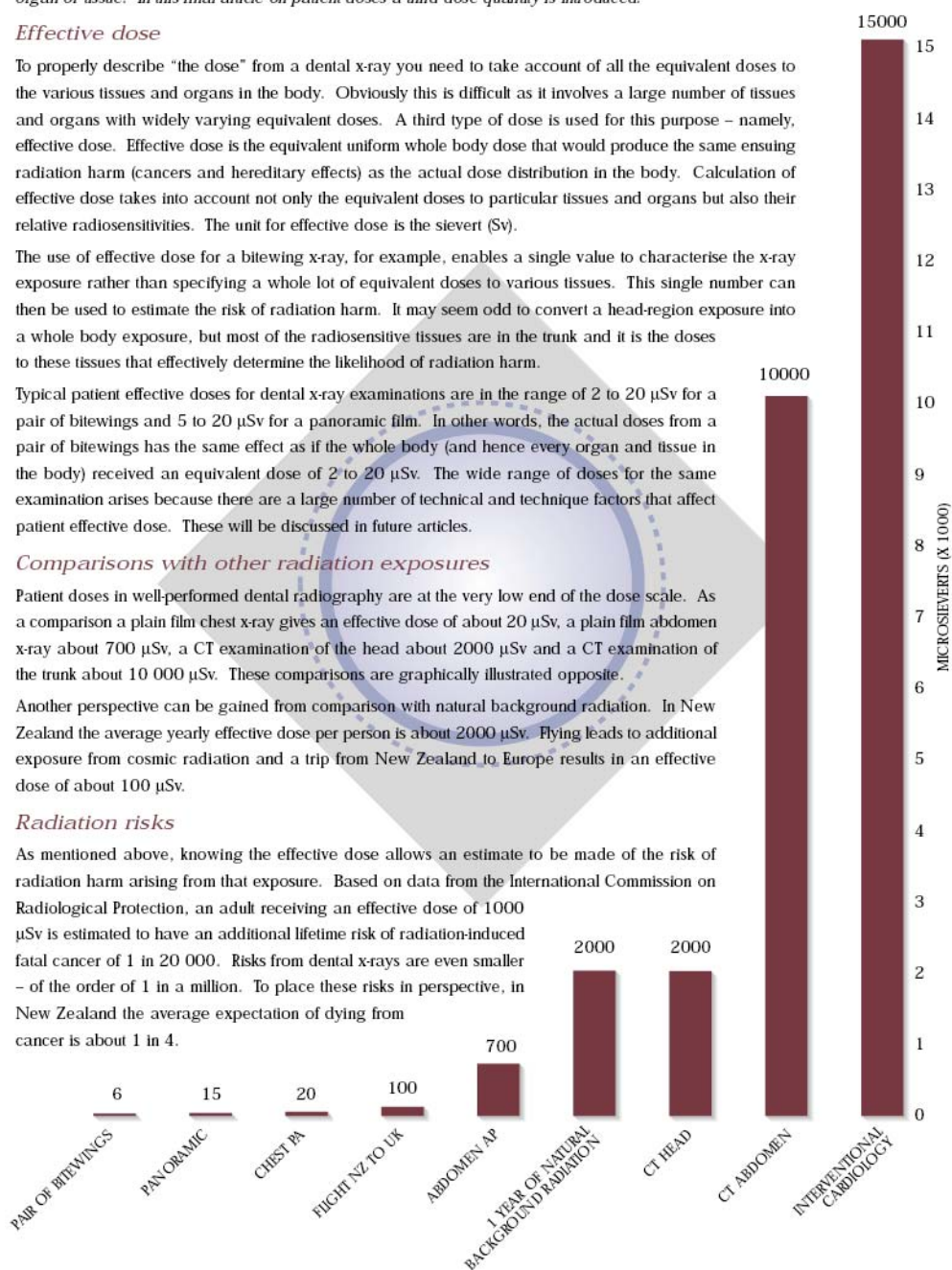
Comparisons with other radiation exposures

Patient doses in well-performed dental radiography are at the very low end of the dose scale. As a comparison a plain film chest x-ray gives an effective dose of about 20 μ Sv, a plain film abdomen x-ray about 700 μ Sv, a CT examination of the head about 2000 μ Sv and a CT examination of the trunk about 10 000 μ Sv. These comparisons are graphically illustrated opposite.

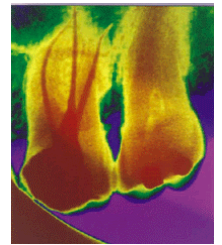
Another perspective can be gained from comparison with natural background radiation. In New Zealand the average yearly effective dose per person is about 2000 μ Sv. Flying leads to additional exposure from cosmic radiation and a trip from New Zealand to Europe results in an effective dose of about 100 μ Sv.

Radiation risks

As mentioned above, knowing the effective dose allows an estimate to be made of the risk of radiation harm arising from that exposure. Based on data from the International Commission on Radiological Protection, an adult receiving an effective dose of 1000 μ Sv is estimated to have an additional lifetime risk of radiation-induced fatal cancer of 1 in 20 000. Risks from dental x-rays are even smaller – of the order of 1 in a million. To place these risks in perspective, in New Zealand the average expectation of dying from cancer is about 1 in 4.



Typical effective doses (microsieverts) from dental and medical exposures and other activities



Appendix 3 Australian Dental Association submission to ARPANSA NCP Review of Radiation Protection Legislation

Introduction

The ADA supports the need for this review. We support the need for regulation in the use of devices that emit ionising radiation. However, we also believe that the plethora and inconsistency of current regulations existing in the various States not only prevent a logical regulation of these matters but add to the costs of operation of dental practices. There is a need in the public interest for protection of health and safety for such devices to be operated by personnel who are adequately trained in their use and who are subject to codes of practice which ensure that they are operated safely. There is also a need to restrict the operation of such devices and not to allow unfettered access to them.

However, these regulations should not unnecessarily impede the freedom of utilisation by trained personnel.

Objectives of the Legislation

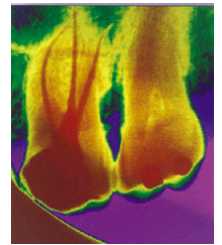
The objective of any radiation protection legislation is primarily to protect the health and safety of the community. This aim cannot be contested but it is important consider the risks involved and how to best address them.

Dental radiography – the risks

The ADA is in favour of prescribing certain standards, maximum levels of exposure or dose limits in regulations, standards and codes of practice. However, there should be consideration given to the fact that routine exposure to dental radiography does not give rise to exposure levels of significant risk to the community.

The gonad dose for dental radiography is minimal, being 0.003% of annual background exposure. As a further illustration, one can compare an abdominal radiograph which gives 1.07mGy for women (507.5 days of equivalent natural exposure) with, on the other hand, a complete oral radiographic survey using E speed film and rectangular collimation, which gives only 0.001 mGy (4.1 days equivalent natural exposure).

It is considered that as the risk to both patients and community is extremely low in the case of dental radiography, there is no justification in applying the same regulations as are necessary for therapies involving more critical radiation doses.



Unfortunately regulation often tends to generalise and thus be over prescriptive and it does not take into account that dental radiography does not involve the same level of risk as other procedures. As example of this is in the NSW Radiation Guidelines, which require provision of protective clothing and lead shielding in walls – measures which are totally unnecessary in the dental surgery provided standard radiation hygiene procedures are followed.

In considering any of this legislation, it needs to be remembered that it applies to medical, scientific and veterinary sources of radiation. As far as dental X-ray machines are concerned, one would have to question whether it is necessary in the interest of public safety that both registration of equipment and the licensing of practitioners are required. There is little evidence that dental x-ray machines cause significant environmental problems or danger to the community. The level of radiation, which is produced by current machines, is minimal.

Impact of radiation protection regulation on other regulations

The practice of dentistry is already regulated through the various State and Territory Dental Boards. To engage in such practice, one must be a registered dentist and these dental legislative and regulatory requirements ensure that only trained and registered personnel are permitted to carry out the range of dental procedures, which include radiography. The Boards not only register dentists but their charter to act to protect the public involves their monitoring of dental practice and the power to impose penalties including suspension in the case of any breach.

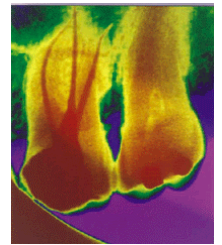
The ADA is of the view that the imposition of additional licensing requirements for the operation of dental radiographic apparatus is superfluous, given this overriding regulation on dental practice.

Restrictions to Competition

Unnecessary Regulation

Some of these regulatory requirements in themselves are plainly over-prescriptive. For example, when a new dental x-ray machine is purchased in Queensland, the following licensing requirements are applied: On purchase, (1) permit for approval, (2) permit to possess and (3) Compliance Certificate. Then to operate the equipment, (4) Licence to operate and thereafter, every three years, the equipment needs to undergo (5) a compliance test.

In NSW, the Radiation Control Regulations 1993 has been amended to require registration of all radiation apparatus used for diagnostic imaging, including that used for dental purposes. This State regulation is also over-prescriptive about the production of dental x-ray machines and their ancillary equipment. For example, it requires that timing devices have the actual figures displayed on them rather than icons, which is an unnecessary impost on the design and production of these items.



Exemptions

Whilst the legislation must provide for licensing of persons dealing with radioactive substances or the operation of ionising radiation apparatus or equipment, it is noted that exceptions are made in this regard for specified occupational groups. These exceptions recognise that the persons defined are competent to be involved in these operations without further licensing. Such persons recognised in various jurisdictions range from students to qualified and registered health professionals.

The operation of any apparatus that involves the emission of ionising radiation must be regulated. Only those whose training and expertise are appropriate for these functions should be permitted to deal in these matters.

Consequently, the ADA supports the need for sensible regulation. The provision of exemptions from licensing must be based on a satisfaction that the occupational group so exempted are, per se, already satisfactorily trained in these tasks and subject to other regulations, which safeguard the health and safety of the community in this regard.

Dentists receive comprehensive instruction in physical sciences at a University level including radiation physics and are trained to operate dental radiographic equipment as part of their clinical training. This includes the relevant safety procedures necessary for the health and welfare of their patients.

There is clearly no necessity for them to undergo any additional training, testing or licensing. The various State and Territory dental regulatory authorities, such as the Dental Boards, have full carriage of these matters in the licensing for dental practice and the monitoring of practice standards. There is some inconsistency in this matter in the regulations in various jurisdictions and not all authorities exempt dentists.

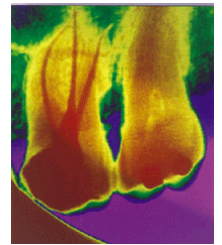
There is little logic in imposing costs and complications when the health professional involved, i.e. the dentist, is already qualified and has had these qualifications accepted by a Dental Board in gaining registration to practise.

It is submitted that registered dentists be granted exemption from licensing in all States and Territories.

Inconsistency in regulation

Registration of equipment: As long as various States have different radiation safety regulations, one can expect anomalies. In Western Australia, for example, the use of intra oral panoramic x-ray equipment is not allowed (unless a special case is made). It is believed that this is a unique situation and is an illustration of the general regulatory inconsistency between States and Territories.

ADAVB Submission to Review of Victorian Radiation Safety Legislation



Licences to use dental x-ray equipment: Similar inconsistencies occur between the various States and Territories. In Victoria, for example, a person registered as a dentist or as a dental specialist by the Dental Practice Board can apply for and will be issued with a licence to operate both intra-oral and extra-oral (OPG and cephalometric) equipment. Similar arrangements are in place in New South Wales and Western Australia, but not in South Australia and Queensland. In these latter States dentists wishing to operate extra-oral equipment have to either show that they have successfully completed an additional course of training or pass a test.

The ADA believes that regulatory differences between States and Territories add unnecessary costs to Australian businesses, especially for dentists who practice in more than one State or Territory, as in border areas. Uniformity in legislation would allow dentists to move from State to State with less impediment or cost and by minimising this upward pressure on fees, would benefit the community.

The rationale for the above-mentioned inconsistencies is unclear. The inconsistencies are confusing for the profession and the dental supply industry. They make the operation of dental practice unnecessarily complicated, increase compliance costs and exert upward pressure on dental fees, to the detriment of the interests of the community.

Compliance costs

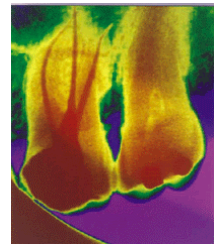
The ADA questions the cost-benefit of registering all diagnostic imaging units. It is noted that the review team is to take into account “*the need to reduce compliance costs and paperwork burden on small businesses*”. In this regard, about 5,000 dental practices in Australia are currently affected by illogical and inconsistent regulations which exist in the various States and Territories. These regulations apply to both the equipment itself and to the operator.

In NSW dentists pay a fee of \$100 to register each x-ray unit and, in many solo practices, dentists are paying up to \$300 per practice or more to register these units. In larger clinics, payments of up to \$3,000 are involved in registration fees alone.

It is clear from the above examples that there is a need to review these regulatory requirements, not only to achieve consistency throughout Australia but also to avoid unnecessary paperwork and administrative procedures, which only increase costs to the community without any benefit.

These various registration and licensing requirements impose significant costs on all dental practices. These costs involve registration fees, annual licensing fees, inspection fees and costs involved with the maintenance of associated records and documentation. There is no evidence that the collection of these fees benefit the user, the general public or the environment.

The regulations in place, which pertain to dental practice and the restrictions on who can practice dentistry are considered to be sufficient to ensure public health and safety, without additional regulations for the possession and operation of x-ray equipment.



Other issues

While this review is concerned with radiation protection legislation there is an associated issue, which the ADA considers to be, in its nature, anti-competitive. One of the greatest impediments to competition in the provision of radiological services is the apparently discriminatory way that services provided are reimbursed. Some come under Medicare arrangements, while others of equal importance, are excluded from the Medicare system.

Medicare covers some services, for example OPGs, only if they are taken by a specialist (medically qualified) radiologist. In order to obtain the highest possible yield from diagnostic radiological examinations and reduce unnecessary radiographic procedures, suitably qualified and competent clinicians should perform the interpretation of these radiographs.

It is not in the best interest of patients when registered dental specialists in Dento-Maxillofacial Radiology are excluded from these arrangements, despite their training and expertise in this field. Indeed, many of these services could be performed in general practice dental surgeries without compromise in the quality and relevance to diagnosis and treatment planning. Many dentists feel that general radiologists are not equipped to accurately diagnose dental disease and it would be better if access to Medicare radiological procedures were available to the dental profession.

Summary

- We support the need for a review of radiation protection legislation in order to protect the public.
- We support the requirement for restrictions on the operation of any ionising radiation emitting apparatus and that the operation of these devices should be restricted to appropriately trained and regulated personnel.
- The review should endeavour to achieve national consistency and eliminate the unnecessary costs to the community through over regulation and illogical variations to regulations among the States and Territories.
- The employment of exemptions from licensing for specific occupational groups, whose training and expertise can be assumed is supported.
- Registered dentists should be exempted from the need to acquire an additional licence to operate dental x-ray equipment.



V I C T O R I A

EQUIPMENT MAINTENANCE

SECTION: A4

INFORMATION RESOURCE SHEET

DATE: DECEMBER 2000

Australian Dental Association Victorian Branch Inc., 49 Mathoura Road, TOORAK VIC 3142

Ph: (03) 9826 8318 Fax: (03) 9824 1095 E-mail: adavbinfo@adavb.com.au Internet: <http://www.adavb.com.au>

INTRODUCTION

The Quality Assurance Committee of the ADAVB Inc. recommends members have all practice equipment covered by service or maintenance agreements, and that practice equipment is maintained according to the manufacturer's instructions. Regular maintenance of equipment can help reduce the possibility of equipment failure and guard against unproductive dental surgery time.

In addition, members can take an active role in reducing the possibility of patient litigation, by ensuring dental surgery equipment is always in excellent operating order.

MAINTENANCE SCHEDULE

The practice principal or practice manager should be nominated as the person responsible for equipment maintenance. A schedule which records the following information for each item of practice equipment that requires ongoing maintenance should be kept:

- Description of equipment
- Model and series numbers
- Original supplier
- Maintenance contractor
- Emergency contact phone number
- Dates of scheduled maintenance
- Dates of any unscheduled breakdown or repair
- Staff registered to operate (If relevant).

A maintenance record should be prepared and maintained for each item of practice equipment that directly affects patient care or safety, or where a sudden breakdown has the potential of causing serious inconvenience or disruption to the efficient functioning of the dental practice.

MAINTENANCE RECORD

Individual maintenance records should state any statutory requirements, in addition to persons who hold specific operator's licences or qualifications. Any other documents which relate to an item of equipment should be filed with the relevant maintenance record.

The record should also contain emergency contact telephone numbers in the event that advice regarding an item of equipment be required urgently.

If an item of equipment breaks down or is discovered to be faulty, a call is made immediately to the relevant maintenance contractor. This information is recorded in the equipment record.

X-RAY EQUIPMENT

A licence is required to use irradiating apparatus in the State of Victoria and this is issued by the Department of Health & Community Services. The Dental Practice Board of Victoria, or the Department, can provide details regarding an operator's licence. A two-year licence is issued for a fee of \$99 and is required for each apparatus. Irradiating apparatus are required to be registered with the Department of Health & Community Services.

Radiation Safety Unit
Department of Health & Community Services
17th Floor, 120 Spencer Street
Melbourne VIC 3000
Telephone: (03) 9637 4167

FORWARD PLANNING

It is a worthwhile exercise to note on the practice's annual planner, equipment contract renewal dates and the dates of planned equipment maintenance.



**THE RADIATION GUIDE
AUSTRALIAN DENTAL ASSOCIATION
VICTORIAN BRANCH Inc.**

DRAFT

RADIATION MANAGEMENT PLAN FOR DENTAL PRACTICES

Practice DETAILS

Name: _____

Address: _____

Ph: () Fax: () Email: _____

RADIATION STATEMENT

Radiation is used in this practice for the early detection, treatment and observation of response to treatment of actual or suspected dental conditions. The benefit to the patient should outweigh the risks involved in radiological diagnosis.

1 RADIATION SAFETY OFFICER (RSO)

Name: _____

Address: _____

Ph: () Fax: ()

Signature - RSO:	Date:
Signature - Manager:	Date:

REVISED

Signature - Manager:	Date:
Signature - Manager:	Date:
Signature - Manager:	Date:
Signature - Manager:	Date:

The duties of the Radiation Safety Officer (RSO) and the Licensee are attachments.

2 responsibilities of the RSO

- a. All persons working with radiation should read the Radiation Management Plan.
- b. The RSO will ensure that all licensed operators and assistants are familiar with the equipment in the practice when first employed.
- c. Training will include a description of the radiological hazards in the practice, the methods employed to avoid those hazards, and the methods used to minimise radiation dose plus the details of this Radiation Management Plan.

3 persons who should read and comply with this document

Dentist/s:

Dental Assistant/s:

Hygienist/s:

Dental Therapist/s:

Others:

4 Responsibilities of Employees

- a. Ensure that only licensed persons operate radiation equipment.
- b. Care required when children present.
- c. Care with processing and storage of film to avoid retaking radiographs.
- d. Wear monitoring devices in accordance with instructions.
- e. Be aware of, and comply with, safety precautions.

WORKING RULES FOR ALL STAFF

IMPORTANT - Keeping good records is a must for the control of radiation exposure in the workplace. See at back of guide for example.

1. **Ensure** that only **licensed persons operate radiation equipment.**
2. **Care** required with **employees.**
3. **Care** required when **children** are present.
4. **Care** required where **pregnancy** is an issue.
5. **Care** required with the **public.**

PERSONAL MONITORING DEVICE – Keep records – See back of guide for example
Worn to monitor levels of ionizing radiation exposure. Wear according to instructions

Conditions –

1. You must wear an approved personal monitoring device at any time when that person is likely to be exposed to radiation in excess of one millisievert in any one year.
2. You must provide a personal monitoring device to every person who is required to wear that device.
3. The period for use of each personal device not exceed **3 months**.
4. Before transferring device – it must be sent to laboratory designated by the Chief General Manager for assessment immediately after the period of use.
5. A person must not tamper with device.
6. Adequate records must be kept.
 - (a) Doses assessed to have received.
 - (b) Details of monitoring results and dose calculation methodologies.
 - (c) The effective dose computed for emergency or accident exposure.
7. Records must be available at any reasonable time for inspection by an **authorised officer**.
8. Accidental exposure is not included in assessment of compliance
9. See the back of the guide for dose limits

Exemptions may be granted from personal monitoring if the wearer can prove (by producing the last 12 month dose record) that their dose was negligible. A letter and the dose report sent to the Radiation Safety Unit is sufficient for an exemption. The exemption is granted on the provision that work practices remain constant and that any change would require re-monitoring for a further 12 months.

Risk Management – Personal Monitoring Guidelines

1. Registered Person
2. Employed by a person licensed
3. Student undertaking training
4. Any other person or class of persons who may be exposed to radiation

LABELING OF ALL RADIOACTIVE SOURCES

Each area – work area or other area where radiation hazard arising from the manufacture, use or storage of radioactive substances may exist **MUST BE POSTED - THE APPROPRIATE RADIATION HAZARD LABELS**

- (a) Each sign must be clearly legible and permanently durable and must be labeled **“CAUTION – RADIOACTIVE”** surrounded by a **black border**
- (b) Supply any additional information for minimizing the exposure of people to radiation.
- (c) **Each container of a radioactive substance bears a clearly visible label identifying radioactive substance, its activity and date on which activity, was measured.**

Exemption

The only exemption from labeling. (If it is disturbing to patients). You must get approval from The Chief General Manager –

See example of labeling at back of guide.

SAFE WORK PRACTICES

5

Safe Work Practices

General

Dentists should ensure that radiation to patients is the minimum required for good treatment after considering past films, or films in the hands of other practitioners before proceeding with a new radiological survey. All staff and patients should be properly shielded and no other persons should remain in the room when films are being exposed. Controls should be such that accidental activation is not possible.

Shielding

Records must be kept of the type of shielding in treatment areas and type and number of protective devices available.

Disposal

X-ray equipment may be disposed of at the municipal tip if high voltage wires to the tube have been cut, or if the unit is permanently disabled. The tip may have other requirements for the disposal of generator (cooling) oils. The Radiation Safety Unit (RSU) must be advised if units are to be disposed of in order to adjust their equipment data base.

If sold, it is a licensee requirement to inform the authority of the name and details of the new owner.

ACCIDENTS – DAMAGE

Obligations re: employees or visitors

You must make proper use of the safety devices and carry out all radiation safety procedures that apply to that employee or visitor.

Plans with dealing with radiation accidents and emergencies – exposure – millisievert amount levels

- (a) Prepare a report – **See back of guide for example**
- (b) Forward a copy to Chief General Manager within 5 working days
- (c) Report corrective actions taken to CGM as soon as practical or within 5 working days
- (d) Place a copy of that report in the appropriate personal record

Monitoring of contamination by radioactive substances

By accident – clothing contaminated or by what degree that presents a hazard to the worker or any other person – must be monitored

See back of guide for example

- (b) Remove worker from the work area if clothing not contaminated
- (c) If clothing contaminated must not be removed from the work area
- (d) Clothing must not be released to the public or cleaners
- (e) Contact Chief General Manager immediately or as soon as possible
- (f) He will direct you to the best possible outcome

6 Emergency Procedures

Reports of radiation incidents are required by Regulation 36 of the Health (Radiation Safety) Regulations 1994 ONLY when someone has received a dose exceeding one millisievert and must be made in writing to the Radiation Safety Unit within five (5) working days. (A dose in excess of one millisievert is extremely unlikely given the output of dental machines).

While acute radiation risk is very low with modern, well maintained dental X-ray equipment, other scenarios should be foreseen. Fire, flood and loss of control for other reasons, may raise the risk of electrocution or unintended exposure to radiation. Actions that may be planned include isolation of the danger area, shutting off power and water, providing warnings to others, and treating any injured persons. Later, recording, repairs and reporting should be completed.

List steps to be taken in the event of unintended human exposure:

HAZARD ASSESSMENT WITHIN PRACTICE

7 Hazard Assessment within Practice

Shielding - walls, floor, ceiling:

Protective aprons, collars:

Position of controls:

Type of machines, KV, beam alignment, collimation, long cone:

COMPLIANCE

8 Compliance

See attached copy of **Radiation Safety Officer – Typical Duties**.

Each RSO should detail how the practice will ensure compliance with regulations relating to:

EQUIPMENT

Personnel

RECORDS

9 Maintenance procedures and safety checks

Manufacturer's recommended inspection interval:

1st machine

2nd machine

3rd machine

Record page to be kept of dates serviced by licensed personnel.

10 Personal Monitoring Devices

These must be worn by any person likely to be exposed to over 1 mSv in any one year as a result of their work.

Monitor Supplier (approved by RSU)

Name:

Address:

Exemptions may be granted from personal monitoring if the wearer can prove (by producing the last 12 month dose record) that their dose was negligible. A letter and the dose report sent to the Radiation Safety Unit is sufficient for an exemption. The exemption is granted on the provision that work practices remain constant and that any change would require re-monitoring for a further 12 months.

11 Regulatory Requirements

Copies of the **Health Act 1958**, and the **Health (Radiation Safety) Regulations 1994** should be kept with this document, as should a copy of the **Conditions of Registration** which is issued with each machine registration.

When promulgated, a copy of the **Code of Practice & Safety Guide – Radiation Protection in Dentistry** issued by ARPANSA should also be affixed.

PENALTIES

Penalties for a breach of the Act and Regulations ranges up to 100 penalty units (One penalty unit equals (\$100))

ENFORCEMENT

Inspections directed by the Chief General Manager can occur at any reasonable time – that means that Inspectors can enter at any reasonable time

1. Inspect that place
2. Test any substance or apparatus found there
3. Remove a sample of any substance from that place for analysis or examination
4. Inspect records
5. Inspect radiographs

FOR EMPLOYMENT PURPOSES - DIRECTION ONLY

1. For Direction only – if there is exposure in workplace that person to be medically examined prior to entering that employment
2. That person to be medically examined at termination of employment
3. During the course of employment can be directed to be medically examined by the Chief General Manager
4. All records of examinations must be kept in an ongoing personal record
5. The employer is liable for expenses of medical examination of an employee

12

Dose Limits

- a. Radiation doses should be ‘As Low As Reasonably Achievable’ (ALARA).
- b. Individual doses should be limited.

The following dose limits are prescribed in the Regulations:

OCCUPATIONAL

Whole Body	50 mSv in any one year
	20 mSv per year averaged over any 5 year period
Lens of Eye	150 mSv per year
Skin	500 mSv (averaged over 1 sq cm) per year
Hands and Feet	500 mSv per year

PUBLIC

Whole Body	1 mSv in any one year
Lens of Eye	15 mSv per year
Skin	50 mSv (averaged over 1 sq cm) per year

Women who wish to declare a pregnancy should seek the advice of the RSO if working with radiation.

13

Contact Details

Radiation Safety Officer:

Registrant / Licensee:

RADIATION SAFETY UNIT

Department of Human Services
17 / 120 Spencer Street
Melbourne VIC 3000
Ph: (03) 9637 4167
Fax: (03) 9637 4508
E-mail: radiation.safety@dhs.vic.gov.au
Internet: www.dhs.vic.gov.au/phd/hprot/rsu

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)

Lower Plenty Road
Yallambie VIC 3085
Ph: (03) 9433 2211
Fax: (03) 9432 1835
E-mail: arpansa@health.gov.au
Internet: www.arpansa.gov.au

Other personal monitoring suppliers:
