

# Is radiation protection of dental patients taken seriously in Singapore?

## Abstract

Singapore's healthcare system is praised by many as one of the worlds most advanced, and thousands of people from around the Asia-pacific region flock there to receive medical and dental treatment annually. However, not all areas of patient welfare hold up well to scrutiny, one of which is radiation protection in dental radiography.

Radiation protection of patients is important to reduce the risks associated with the use of ionizing radiation. However, there is limited legislation and no national guidelines on this matter in Singapore. This has led the author to identify several common practices that have developed nationally, that increase the likely exposure of dental patients to potentially harmful ionizing radiation. The author recommends that a number of changes need to be made in the interest of protecting patients. National guidelines on radiation protection in dental radiology much be published, a national audit framework for dental radiography should be introduced, the practice of untrained, unlicensed staff exposing patients to ionizing radiation should be abolished, and radiation dose reduction measures should be implemented as standard across all dental practices.

**Keywords:** radiation protection, dental, radiography, Singapore

## Opinion

Singapore is often lauded for its meteoric rise from a 'third world' to 'first world' country. A top-class healthcare system is one of Singapore's crown jewels. The international recognition of the quality of healthcare here is evidenced by the fact that, despite considerable competition from neighbouring countries, it remains a top medical tourism destination in the Asia-Pacific region, accounting for yearly receipts of close to S\$1 billion according to latest available Singapore Tourism Board figures.<sup>1</sup> However, as a medical practitioner on the ground, I am often unpleasantly surprised at some of the standard practices adopted, and how they deviate from international standards. In this opinion piece, I wish to highlight one such example; radiation protection of dental patients.

The argument may be made that the radiation doses from traditional intra-oral dental radiography are low, and so a rigorous overhaul of standard practice may be inconsequential. However, the stochastic nature of the effects of ionizing radiation mean that there is no 'safe' dose, and protection measures should be put in place for patients insofar as possible.<sup>2</sup> Recently, with the increasing popularity and prevalence of more complex imaging modalities such as cone beam computed tomography in dental practices in Singapore, doses imparted to dental patients may be considerably higher.<sup>3</sup> In a culture where radiation protection is lacking, this is a worrying development.

The regulatory authority responsible for radiation protection in Singapore is the National Environment Agency. While there is national legislation around radiation protection,<sup>4</sup> they do not publish any national guidelines on radiation protection for patients in dental radiology. Their role in reality is the initial commissioning of radiology equipment, issuing of licenses to operate dental radiology equipment, and monitoring of thermoluminescent dosimeter readings from workers involved with ionizing radiation. Every practitioner involved

in operating radiography equipment in Singapore should be in possession of an L5 license, which is issued after providing evidence of adequate training and experience in the use of such equipment. While most dental professionals hold such licenses, it is common practice to defer the taking of intraoral and extraoral radiographs to unlicensed dental assistants, who rarely have formal training. This increases the likelihood of radiographs lacking in diagnostic value and requiring repeated exposures, unnecessarily increasing the amount of ionizing radiation delivered to the patient.

Untrained staff taking radiographs is just one example of how radiation protection is not a high priority among Singapore dental practices. Dental panoramic tomography as a screening tool or as part of a 'package' is commonly advertised, without justification for its use. In addition, I have visited many practices throughout the country over the past several years, and have yet to see a rectangular collimator attached to a tube-head cylinder. In fact, my use of the word collimation was received with blank stares in a recent tutorial on dental radiology to students who, in less than a year, will be licensed to take radiographs on the general public. Furthermore, in a country that prides itself on its smart use of data, there is no national data compiled on the use of dental radiographs, even though such data is readily available in countries such as the UK, Germany, Sweden and others.<sup>5</sup> No national audit framework or quality assurance program exists for dental practices to benchmark themselves against or ensure that best practice is being applied for patients.

When combined together, these practices paint a picture of disdain for the potential consequences of lax radiation protection for patients. For radiation protection to be taken seriously in Singapore, I am of the opinion that a number of changes have to occur;

1. National guidelines on radiation protection in dental radiology much be published.

2. A national audit framework for dental radiography should be introduced.
3. The practice of untrained, unlicensed staff exposing patients to ionizing radiation should be abolished.
4. Radiation dose reduction measures should be implemented as standard across all dental practices.

I believe these changes are needed for us to practice more ethically and in our patients' interests, and keep the trust that patients have in us here in Singapore, not just locally, but on the global stage.<sup>6</sup>

## Acknowledgements

None.

## Conflict of interest

The author declares that there is no conflict of interest.

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