The Royal Australian and New Zealand College of Radiologists®

Committee Secretary
Senate Legal and Constitutional Affairs Committee
PO Box 6100
Parliament House
Canberra ACT 2600
Australia

Dear Committee Secretary,

Re: Inquiry into the Crimes Amendment (Fairness for Minors) 2011

Please find enclosed a submission prepared by The Royal Australian and New Zealand College of Radiologists (the College) in response to the Inquiry into the Crimes Amendment (Fairness for Minors) 2011. The College is the leading professional organisation for the promotion of the sciences and practice of the medical specialities of Radiology and Medical Imaging (Diagnostic and Interventional) and Radiation Oncology in Australia and New Zealand.

The College writes in support of the Bill to amend the *Crimes Act 1914*, in particular Item's 1 and 2 which will remove any possibility of taking an X-ray of a person's body part as a prescribed procedure for age determination, and ensures that the regulations cannot be used to re-insert the possibility of taking an X-ray of a person's body part as a prescribed procedure for age determination.

The College considers it unethical to expose a young person to x-rays for purely administrative reasons. X-rays of teeth and wrists should not be used as evidence in a court of law because the age assessments obtained by these means are very inaccurate.

Age Determination Processes

There is overwhelming evidence that bone age estimation is too inaccurate to be used for determining chronological age for legal reasons. There are many factors that need to be considered when trying to establish an individual's age based on bone age estimation. Various clinical methods, such as the Gruelich and Pyle method[1] (GP method[a], which is a technique for evaluation the bone age of children by using a single frontal radiograph of the left hand wrist), are often unreliable and not validated for determining the age of refugees. Recently radial differences have been shown in Middle Eastern, Asian and Black American populations with bone age disparities between 6 to 12 months depending on the age when the children were assessed[234].

The assessment of bone ages at any age has the potential for error involved in its interpretation. However, even when the bone age assessment is correct, the bone age may still be normally delayed or advanced relative to the subject's chronological age depending on their pubertal status and thus not accurately reflecting the chronological age of the individual.

[a] The GP method was designed for assessment of skeletal age knowing the chronological age, not the reverse, and was based on a white middle class American population born in the 1930's and 1940's, and the result obtained can be affected by malnutrition and radial factors prevalent in refugee populations.

Holistic Age Assessment

We understand that there is a push from the Australian government for a scientific/medical method for age determination in the accused refugee population who claim to be juveniles. However, we object to the current practice of relying on wrist X-rays or the proposal to use dental X-rays as a means of determining age due to the lack of evidence that supports its use in this way.

Whilst there is no single medical way to accurately determine an individual's age, the government should consider developing a process where age is assessed in a number of ways; this is often referred to as 'holistic' age assessment. This approach incorporates narrative accounts, physical assessment of puberty and growth, and cognitive, behavioural and emotional assessments.

Methods should also include social assessments that incorporate local knowledge about the person along with significant weighting given to the assessment of the young person's maturity and their coping skills. The Government should further develop its use of voluntarily agreed, focused interviews by appropriately trained and independent personnel, such as social workers.

It is also essential that the Government thoroughly investigates for any evidence which may be available from the accused person's homeland. This should be done early in the process rather than waiting for an external source, such as a prosecutor or defence counsel, to gather the information. It is also essential that the benefit of the doubt is given when the assessment of a person's age is inconclusive rather than risking the detention of juveniles in adult prisons.

Considering the lack of evidence to support the use of X-rays in age determination, we encourage the immediate re-assessment of those young people currently being detained for people smuggling with attention to be given to the alternative methods of age determination suggested above. We also recommend that alternate accommodation outside adult prisons is found for those detainees whose age cannot be proven by these methods and who may be detained on the basis of expert opinions that are reliant on discredited scientific evidence.

The Ethical Concerns Surrounding Appropriateness of Radiation Use

A concern with the current methods utilised for bone age determination surrounds the issue of appropriateness in the use of radiation. Any form of X-ray is invasive because it involves irradiation of the subject. One of the most important principles underpinning medical imaging is the ALARA Principle (As Low As Reasonable Achievable). This requires three factors to be met in the performance of imaging examinations, with a particular emphasis on those using ionising radiation – justification, optimisation and dose limitation. Justification requires any proposed imaging examination to yield a sufficient benefit to society to justify the risks incurred by the radiation exposure, and is based on the hypothesis that any radiation

exposure, no matter how small, carries with it a certain level of risk (the linear, non-threshold hypothesis, or LNT)[5]. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has adopted a Code of Practice[6] which is progressively being implemented by each Australian jurisdiction through local radiation safety regulations; the Code requires the ALARA Principle to be applied for each examination involving ionising radiation.

Determining the risk of the level of radiation involved with a procedure must involve consideration of not just the amount of radiation involved, but also the clinical benefit of the procedure to the subject. If a procedure is without benefit and its application is not evidence based, any level of radiation exposure is considered unacceptable, no matter how 'trivial' the radiation dose may be considered. The absence of any medical benefit to the individual from the use of X-rays for age determination means that these examinations cannot be justified and are not consistent with the ALARA Principle. The Commonwealth Director of Public Prosecutions (CDPP) may only rely 'on the analysis of a wrist X-ray where the expert radiologist has concluded that the defendant is probably 19 years or older', however, this does not alter the fact that the subject has already been exposed to radiation for no clinical benefit, and for doubtful benefits to the courts.

Conclusion

In consideration of the enormous impact that these age determination decisions have on individuals, we believe that the Australian Government should ensure that it is using the best available evidence accurately, supported by the consensus of opinion from groups such as professional medical associations and colleges. Government funds should not be utilised to pay for expert opinions which do not represent evidence based medicine, the opinion of isolated paid experts should not take precedence over the opinion of all specialist groups in the field.

The current practice of bone age assessment inevitably results in children misclassified as adults and there is considerable potential harm if this occurs. We urge that other comprehensive approaches to age determination are sought. Bone age assessment should not be used for this purpose in Australia.

If you require any further information, please do not hesitate to contact me.

Kind regards,

A/Prof Dinesh Varma
President, RANZCR

[1] Greulich WW, Pyle SI. Radiographic atlas of skeletal development of the hand and wrist, CA: Stanford University Press; 1950.
[2] Chiang K-H, Chou AS-B, Yen P-S, et al. The Reliability of Using Greulich-Pyle Method to Determine Children's Bone Age in Taiwan. Tzu Chi Med J 2005;17:417-20.
[3] Zhang A, Sayre JW, Vachon L, Liu BJ, Huang HK. Racial differences in growth patterns of children assessed on the basis of bone age. Radiology 2009;250:228-35.
[4] Bukena B, Safak AA, Yazıci B, Buken E, Mayda AS. Is the assessment of bone age by the Greulich–Pyle method reliable at forensic age estimation for Turkish children? Forensic Science International 173 2007;173:146–53.
[5] ICRP, 1991. 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Ann. ICRP 21 (1-3).
[6] ARPANSA, Code of Practice for Radiation Protection in the Medical Applications of Ionising Radiation, Radiation Protection Series Publication No. 14, 2008.