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Age determination in refugee children

Background
For many refugees, an accurate age is not known and the age on their visa does not reflect their true age. This has implications for medical care, education, socialisation, and for legal reasons.

Objective
A model for age assessment is suggested based on that of the Royal College of Paediatrics and Child Health in London using basic demographics and a narrative account from the parent.

Discussion
Age assessment is complex, as most of the physical and developmental parameters used for medical and legal purposes have been developed from research in particular climates, ethnicities and environments where there is good health and nutrition. X-rays or dental examination should not be necessary for all children of uncertain age.

Age is taken for granted in the developed world. Most Australians know on what date they were born. For many refugees who settle in Australia this is not the case. A medical or educational assessment of a child will include an assessment of the child's true age as this will ensure that they have the correct vaccinations, are taught at a suitable educational level and are appropriately served by government institutions such as schools and hospitals, and dentists. Correct age is also important as a means of determining potential emotional resources for dealing with stressful life events and the attainment of developmental milestones. Age determines the time at which a young adult can drive a motor vehicle, vote, and receive Centrelink payments. Accurate age estimation is also vital to ensure that local authorities fulfil their obligations in providing support and services to vulnerable groups such as unaccompanied minors less than 18 years of age.[1] Legal estimation of age needs to be done with the assistance of a lawyer. Information recently published by the Centre for Multicultural Youth Issues[2] outlining the process for legally changing a young person's date of birth can be found at www.cmyi.net.au/ResourcesfortheSector#InfoSheets.

Issues with age inaccuracies

Even a small inaccuracy in age estimation can result in an adult being denied access to freedoms that adulthood should bring, and children being expected to behave in ways that are not commensurate with their real age. This is most marked in children who have had malnutrition and experienced severe trauma. These children tend to have a growth spurt with accelerated skeletal and sexual maturation when they settle in Australia. This may lead to them carrying an added burden of expectation in school and the community because they are assumed to be older than their true age.[3] Starting schooling in the age appropriate class is important for learning experience and socialisation with peers, a major factor in how a child settles into the new environment.

There are many reasons for a discrepancy between the date of birth on a person's visa and their true birth date. These may include:

- the significance of birth dates tends to be a cultural phenomenon: many refugees may know their year of birth without having noted the day and month
- the banning of calendars (eg. in Afghanistan)
- the chaotic circumstances surrounding the time of birth (eg. during flight)
- the child spending time separated from parents
- the child being the child of only one parent (eg. one wife may immigrate with the children of other wives)
- the child being adopted from another family
- the visa authorities making an inappropriate estimate of the child's age, or
- as a result of other systemic or administrative errors or mishaps.

For families with no record of a child's date of birth, authorities will often arbitrarily record a birth date of 1 January. It is therefore common for children born in the middle of the year to be given a birth date that is 18 months different to their true birth date.

Age assessment

In the absence of a known birth date, any assessment of age will be difficult. Even in circumstances of good health, adequate nutrition and a stable environment, milestones (behavioural, social and physical) vary within a wide range of normality. In circumstances of illness, undernutrition, extreme stress and disrupted socialisation, tools used to assess age are likely to be even less reliable.

The Royal College of Paediatrics and Child Health in the United Kingdom acknowledges that age determination is an inexact science and the margin of error can sometimes be as much as 5 years either side, especially around the time of puberty.[4] The college made the following statement in November 2007.

'We accept the need for some form of age assessment in some circumstances, but there is no single reliable method for making precise estimates. The most appropriate approach is to use a holistic evaluation, incorporating narrative accounts, physical assessment of puberty and growth, and cognitive, behavioural and emotional assessments. Such assessments will provide the most useful information on which to plan appropriate management'.[5]

Dental age, looking at the emergence and development of the primary and secondary teeth, is often cited as the most reliable assessment of age and has a mean accuracy of +/- 2.15 years.[4,6] However there are inter-ethnic differences in the rate of dental maturation.[6] A proper Demirjian's evaluation of dental maturity involves dental panoramic X-rays and a complex assessment based on calcification stages for the seven left permanent mandibular teeth.[6] This method is inappropriate to predict age with accuracy after the age of 18 years.[6] Teeth may be unable to be assessed clinically in children with teeth in very poor condition, such as due to malnutrition or lack of dental hygiene and care. Factors such as nutrition, stress, temperature and humidity may affect teeth maturation.[6] The added risks of radiation exposure should be weighed against any perceived benefits of this procedure.

Case study 1

Elizabeth arrived in Australia from Africa with her five siblings and parents in February 2007. Her date of birth was registered as 1 January 2004, which would have made her just 3 years of age. However her height was 123 cm and her weight 20 kg. This was way above the 95th percentile for height and weight for a 3 year old, but about the 50th percentile for a 7 year old. Even though Elizabeth spoke no English she sat with her legs crossed on the chair listening intently to the consultation and generally behaving in a more mature manner than would be expected of a 3 year old. On further questioning the entire family became quite distressed and after a long discussion in a dialect that the interpreter did not know, insisted that the child was 3 years of age. A wrist X-ray for bone age also suggested that Elizabeth was 7 years of age. The doctor again discussed with the parents the importance of Elizabeth being in the right class for school and that if she was indeed 3 years of age then there was concern that she may have a severe medical illness that had accelerated her growth and which would need extensive investigations. After much deliberation the parents said that she was in fact 7 years of age but they were afraid that she would be sent back to Africa if the authorities found out. The family were reassured that Elizabeth would not be sent back to Africa because of the age discrepancy. Letters were written so that the appropriate immunisations could be given, Elizabeth could start school and so that the process of officially changing her age could begin.

Case study 2

Abdi arrived in Australia from Somalia in June 2007 with his parents and three siblings. His date of birth on his visa was registered as 1 January 1996, making his age 12 years. His height was 148.5 cm and weight 35 kg, both on the 50th percentile for a 12 year old. Developmentally Abdi looked and behaved like a prepubescent child showing no signs of voice change or facial hair. His parents agreed that Abdi was not showing any characteristic signs of puberty. Abdi's wrist X-ray at the end of 2007 indicted Abdi's bone age to be approximately 10 years. According to Abdi's parents he was born in 1994 making his age, by their account, 14 years. His parents also insisted that Abdi was born 1 year after his older brother, who is 15 years of age. The older brother's age was recorded on his visa correctly and was not in question. The parents also provided childhood immunisation records, which indicated that Abdi was given his first vaccination for DPT on the 24/11/94. The school Abdi is currently attending is worried and quite confused as to whether he should be placed in primary or secondary school. Abdi's parents insist that he is a normal 14 year old boy who should be in high school, but acknowledge that he only looks 10 or 11 years old. Abdi's case was presented to the Department of Immigration and Citizenship (DIAC) who are undertaking to follow up at the country of origin any possible mishaps with the original visa application.

X-ray of the wrist is a controversial means of assessing age because of the exposure to ionising radiation for nonclinical purposes.[5] Mineralisation of the carpal bones begins at birth and lasts until approximately 13 years of age for girls and 15 years of age for boys; and for the epiphyses of the ulna and radius, mineralisation lasts until 16–17 years of age.[7] Age estimation after the adolescent period is more difficult as changes in the carpals are not clear after 14–16 years of age.[7]

The atlas method is the most common method for determination of skeletal maturity. The standards were developed from 1931–1942 using X-rays of the hands and wrist of 1000 Americans of northern European descent and upper socioeconomic class. They were last reviewed in 1988 using 100 X-rays.[8] It has been argued that these standards are not applicable in 2008 or for other geographical locations, climates, ethnicities or socioeconomic groups.[8–10] Skeletal maturation is significantly affected by puberty, therefore sexual maturity should be taken into account when assessing X-rays.

A study in the United States of America showed significant discrepancies between ethnic groups (such as African and Asian) of up to 11 months between bone and chronological age, especially in late childhood and adolescence.[9] Other studies show an even greater discrepancy in bone age when the country of residence as well as ethnicity, is taken into account.[8] This may be due to factors such as antenatal causes, general health, nutrition, climate, or vitamin D and calcium levels. Socioeconomic status, illness, malnutrition and poor hygiene significantly affect the rate of ossification of bones with those people of lower socioeconomic status having a slower rate of bone maturation.[8] Most people who come to Australia as refugees have experienced standards of nutrition and hygiene that are lower than the rest of the Australian population.

The Tanner grading system utilises assessment of the pattern of development of pubic hair in children, breast development in girls and penile and testicular size in boys to assess the stage of sexual

Table 1. Age assessment tool

The following assessment tool should be used to confirm age estimates in the absence of correct legal documentation. Accuracy of the final assessment will be within a range of approximately 2 years and should be expressed as an estimate for educational purposes only. This estimate is not legally binding.

- If estimated age (age stated by parents and others) of child is less than 18 months different to the age on the visa, do clinical history and assessment
- If estimated age is more than 18 months different to the age on the visa add X-ray of left wrist.

Questions that may be useful in helping parents remember the child's date of birth:

- Are there any other records that may show child's age – immunisation/health records?
- Where was the family at the time of birth?
- Time of year of birth (winter, summer, wet, dry)?
- Walking (approximately 1 year) – how long ago?
- Toilet trained, ie. dry in the day (approximately 3 years) – how long ago?
- Age in relationship to other children in the family?

Age assessment guide

Questions/observations:	Assessed age
Date of birth on visa:	
Child's age according to other documentation (eg. early childhood immunisation records, passport)	
Parents initial estimate of age:	
Weight: Plot on 50th percentile and find age to match	
Height: Plot on 50th percentile and find age to match	
Assessment of child's date of birth according to parent's story	
Assessment of child's current developmental stage: www.health.qld.gov.au/child&youth/factsheets/	
Puberty (if appropriate and with consent): Girls – periods commenced (usually around age 11–13 years) Boys – noted voice change (usually around age 13–15 years)	 <11 or >13 <13 or >15
Health or educational professional's estimate of age on the basis of maturity and relationships with other people	
X-ray left wrist:	
According to the Migrant Health Service Clinical Procedure for Age Assessment – which includes the above criteria, the clients age is assessed as:	

development. It was originally based on Scottish children with low socioeconomic status in the 1950s. Values showed a wide range of individual variability of up to 6 years age difference across different ethnicities.[10] It would not be considered appropriate in most cultures to examine breast development or penile or testicular size as part of a usual screening assessment. Any questioning or assessment of sexual maturation should be done with extreme sensitivity and the consent of both the child and parents.

The narrative history

Given that the 'science' of age assessment is inexact, it is important that the narrative account – the parent's story of the time and circumstance of the child's birth and developmental milestones – is clearly documented, as this is the most likely means of properly assessing the child's age. The parent's narrative account will include observations such as: where the family was at the time of the birth; the time of year of the birth (eg. winter, summer, wet, dry); when the child first walked (approximately 1 year), when the child was dry during the day (approximately 3 years) and their age in relationship to other children.

Other supportive information such as a child's early immunisation history is also extremely valuable. Despite the chaos and uncertainty of many families' pre-immigration experience, parents frequently retain original records such as 'road to health cards' and immunisation documents. In the absence of documentation many practitioners acknowledge the importance of validating a parent's narrative history of immunisation and other health events, which are proudly and carefully retained as remnants of a chaotic and painful past.

Recording an accurate narrative account requires time and patience, a good interpreter and a nonjudgmental approach. Without due care such 'interrogation' can cause considerable upset to the family whose 'expert' knowledge of the child is being questioned or undermined.

Table 1 outlines the details used in the author's health service to assist age estimation.

Conclusion

Assessment of a refugee child's age is extremely important but very difficult because of differences in ethnicity, health and sociodemographic background from the recognised standards usually used. Narrative history used in conjunction with observations such as developmental milestones, height, weight, social maturity and sexual maturity (when appropriate) are suggested if the estimated age is less than 18 months different to the age on the patient's visa. If the estimated age is more than 18 months different to the age on the visa, then an X-ray of the left wrist and/or dental assessment should be included.

Conflict of interest: none declared.

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