

CORRESPONDENCE

Forensic Age Estimation—Methods, Certainty, and the Law

by Prof. Dr. med. Andreas Schmeling, Prof. Dr. med. Dr. jur. Reinhard Dettmeyer, Dr. med. Dr. phil. Ernst Rudolf, Dr. med. Volker Vieth, and Prof. Dr. med. Gunther Geserick in issue 4/2016

No Medical Indication

It is to be welcomed that the authors correctly use the term age “estimate,” rather than “determination,” for the result of their age assessment efforts (1). Furthermore, we notice the admission that the X-ray investigations in the context of forensic age estimation are undertaken without medical indication. This means that the central demand of the German X-Ray Ordinance—the justifying indication requires the statement that the health benefits of the use in humans outweighs the risk posed by radiation (§ 23, 1 RöV)—is not met. In order to make possible the use of X-rays in spite of this, “a requirement for a legal basis for authorization” is described in the article. The relevant case-law is extraordinarily controversial. To refer to an alleged “benefit for the general public” is a questionable construct, which is not covered by our medical professional code. Under no circumstances should we delegate our very own medical responsibility for using ionizing radiation to judges who lack the specialist expertise. The use of X-rays is not as harmless as described. Comparisons with the natural effective dose or even with everyday risks, such as participation in road traffic, lead us nowhere. Background radiation as a pathogenic factor is by no means trivial (2). Additional radiation exposure should be avoided wherever possible, especially in children and adolescents (“minimization requirement,” [§ 25, 2 RöV]).

Studies from all over the world have shown that computed tomography scanning in childhood and adolescence results in an increased risk for certain cancers, especially leukemia (3); increased rates of thyroid cancer have been described after dental X-ray examinations (4).

X-rays should not be used in the context of forensic age estimation; they are dangerous, have no medical indication, and cannot provide any answer to the crucial question “younger or older than 18.”

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Conflict of interest statement

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Minimum Age Concept: Full of Pitfalls

The authors deserve recognition for describing the minimum age concept in the forensic age estimation of young refugees (1), because many experts ignore it. Many physicians infer majority only from the completed maturation of the bones of the hand (possible at 16.1 years, according to Schmeling) or wisdom tooth mineralization (possible at 17.3 years). Some even think that refugees themselves should prove that they are underage, which is wrong. The onus, instead, is on physicians and administrative bodies to prove that someone is over 18; if this cannot be done beyond a shadow of a doubt, the person should legally be considered a minor. But the minimum age concept itself has its pitfalls. It is based on the idea that the reference studies’ youngest participant represents the lower limit for a particular characteristic. The sample size in the relevant age range is often small. Schmeling’s example posits ossification stage 3a of the medial clavicular epiphysis. It uses a reference study by Wittschieber with only 24 male subjects (2). Fortunately for the young Somali being assessed, two of the subjects happened to be minors. Similarly, the oft-cited reference study by Kellinghaus is statistically deficient, given its small sample size in the critical age range (3). By contrast, a large study by Bassed (4) documented 17 year olds as having stage 5 ossification, the highest ossification stage—a finding that illustrates the absurdity of the research method if the intention is to use the minimum age concept. These results confirm a long-known fact: there is enormous variation in the chronological course of puberty as well as of bone and dental development. Physical maturity cannot be used to prove legal majority. For this reason, and also because of medico-ethical and legal considerations, genital and X-ray exams should not be performed without clear medical indication.

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Dr. Nowotny is a pediatrician advocating for human rights of young refugees.

One-sided Overview of the Problem

It is alarming that a psychological assessment of the refugee minors was not mentioned anywhere in the article (1). The psychological developmental status is crucial to assessing a young person’s maturity. Significantly, the authors excluded political and ethical aspects of age assessment of unaccompanied young refugees of disputed ages—from a medical ethical perspective this is a limited approach. The argument proffered in favor of using X-ray examinations without medical indication is, “This does not necessarily require a benefit for the health of the individual, but can also be considered as the expected benefit of the relevant laws to the public.” This reasoning is dangerous, because in our legal system, an individual’s autonomy ranks very highly. The German Medical Assembly has repeatedly argued against using X-ray examinations to assess a person’s age. The article says that “resolutions made by the German Medical Assembly express professional statements and are not legally binding.” Decisions passed by the German Medical Assembly can obviously result in professional legal consequences, and obviously the delegates at the 113th German Medical Assembly had considered this by saying in decision V93: “Because of several additional age assessments in underage refugees that were undertaken by using hand X-ray examinations, we wish to remind colleagues of the German Medical Assembly’s decisions of 1995 and 2007—namely, that the involvement of doctors in forensic age estimations is to be adamantly opposed,” and “questions pertaining to aliens law absolutely cannot legitimize medical indications of procedures that pose a risk to the body, such as X-ray examinations.” No one can simply ignore these decisions. This review article provides a limited and one-sided overview of the problem.

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Exceedingly Rare

The authors point out that differences in ethnicity, socioeconomic status, and possibly due to accelerated development or developmental disorders, have to be discussed in the assessor’s report (1). Since a completed 18th year of life is crucial in terms of legal decisions, an unequivocal proof on the basis of biological characteristics would certainly be helpful in proving or excluding minority. All methods named by the authors relate to characteristics of biological maturity and therefore to identical physiological mechanisms that are regulated genetically, hormonally, and by the named external factors. In healthy persons, puberty starts at age X and ends after a time period Y when adulthood is reached. Both parameters are extremely variable, and, contrary to what the authors say, no evidence based studies exist for the group under discussion in the article—that is, a statistically large enough cohort with documented age and maturity characteristics. The studies cited in the reference list do not meet this standard. In Germany, data published in the German Health Interview and Examination Survey for Children and Adolescents (KiGGS) (2) showed that the confidence interval for the 3rd to 97th percentile of the different maturity characteristics in healthy adolescents was at 5–6 years. For African youths, the relevant data exist only as samples, which imply that onset of maturation in this group differs by 1 to 2 years (3, 4). Without the relevant data, defining a “minimum age” seems arbitrary, even though it might be convenient for the assessor. “Differences in age estimations by the different diagnostic tools can be due to a possible endocrine disorder.” In principle this is possible, but in my personal experience, the disorders that this might apply to are exceedingly rare, whereas the substantial physiological variability in sexual maturation in healthy adolescents is something that pediatric endocrinologists are confronted with on a daily basis.

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In Reply:

The critical comments by Eisenberg, Nowotny, Dietrich, and Mohnike in response to our article (1) are by no means unexpected. We are familiar with most of the arguments brought forward. Space restrictions on the actual text of the article as well as on the cited references mean that we can refer our correspondents to already published, detailed debates.

Eisenberg repeatedly expressed his view that X-ray examinations without medical indication are inadmissible. We can only point out once again that X-ray examinations without medical indication are legitimate, according to § 25 sentence 1 of the German X-Ray Ordinance, “in other cases provided or admitted by the law.” X-ray examinations are obviously associated with risks. For a serious classification of the risks of X-ray examinations used for forensic age estimation, taking into consideration the respective effective radiation doses, a comparison with natural and civilizational radiation exposures and other everyday risks makes perfect sense and has most recently been undertaken by Meier et al. (2). It is correct that unnecessary radiation exposures should be avoided at all cost. For this reason, the Study Group on Forensic Age Diagnostics recommends CT scanning of the sternoclavicular joint only if hand ossification is completed (3). Nowotny creates the impression that only very few reference studies with small case numbers exist for the time course of the ossification of the medial clavicular epiphysis. An article by Schmeling et al. (4) showed that this is not the case. It is the expert’s duty to select from the multitude of existing studies those that are appropriate for the concrete individual case. The study cited by Nowotny (5) has a serious methodological flaw, since only one slice of the CT series was evaluated in each case. This study can therefore not be used for age estimation practice.

Taking a young person’s psychological maturity into account as demanded by Dietrich is justified—for example, for the purpose of assessing a possible need for youth services among persons who have completed their 18th year of life. In all legal questions relating to the chronological age of a person with a doubtful age statement, a psychological maturity assessment is not expedient because of the lack of relevant studies that correlate indicators of psychological maturity with chronological age in a forensically useful way. Consequently, psychological and psychosocial age estimates have been rejected by numerous courts, nationally as well as internationally.

Dietrich regards the statement that in the case of X-ray examinations, “this does not necessarily require a benefit for the health of the individual, but can also be considered as the expected benefit of the relevant laws to the public,” as dangerous reasoning, which contradicts our legal system. We can follow his line of thought only if we assume an obvious lack of knowledge of the legal foundations that are valid in Germany. The quotation does not reflect our personal opinion but comes from the explanatory memorandum of the German X-Ray Ordinance (BR-Drs. 230/02).

From an expert perspective, the most recent publication on the decisions of the German Medical Assembly against forensic age diagnostics comes from Rudolf (6). He noted that the motions for the year 1995 commented, rather appropriately, that for age diagnostics in processes of aliens law on the basis of X-ray examinations, legal authorization grounds were questionable and insufficient medical scientific understanding prevailed at the time. The following decisions passed by the German Medical Assembly in 2007, 2008, 2010, and 2014, by contrast, reflected less of a professionally based position held by doctors, but, rather, the ideologically guided aims of the organizers of the initiative and their lack of understanding of what is required from expert proof. Mohnike cites several studies reporting variations in the signs of sexual maturity. We are aware of these facts. Since forensic age diagnostics—as explained in our article—is based primarily on the assessment of skeletal and dental indicators of maturity, which are far less chronologically varied, this is of no relevance to age assessment practice.

In sum, we conclude that the criticisms expressed in the readers’ letters to the editor are in our opinion not equipped to challenge the evidence based foundations of forensic age diagnostics. DOI: 10.3238/arztebl.2016.0488

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