OSAC Registry Approval (Legacy) 1.5, Comment Adjudication Response Template



Document Title	ADA Technical Report No. 1077-2020 Human Age Assessment by Dental Analysis						
Requesting Unit	Forensic Odontology						
Unit Chair		Unit Technical Contact					
Name	: Ken Asccheim	Name: Kathleen A Kasper					
Affiliation	:	Affiliation					
Beginning Comment Period Date End Comment Period Date	5/4/21 6/4/21	-					
Comment Adjudication Meeting Dates # of Members Present	22-Aug-21						
Resolution Date and Vote Outcome	8/22/2021; 13 Yes; 0 No; 1 Abstain.						

Note: This template is intended for use by all Units considering a new document for addition into OSAC Registry

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1	Section	Page	Commenter	Editorial or Technical	Attached File	Comment/Proposals	Response	Reason	Resolution
2			Will Guthrie, NIST			I think that ADA Technical Report No. 1077-2020 Human Age Assessment by Dental Analysis should be place on the OSAC Registry because it provides many careful points of guidance for both the dental expert and others who may need to assess the age of a person through dental means. Importantly, this document does clearly acknowledge the presence of uncertainty in the results of dental age assessments and generally seems to mandate the use of age intervals by practitioners, "The practitioner provides the best and most accurate assessment of an age interval Thoughtful consideration should be given to sex, identifiable human group, geographic population specificity, and environmental factors." The report also notes that "A point estimate of age alone is not an accurate way to describe a dental age estimation. It is unacceptable because it may lead an investigator to misinformed conclusions about the value of the estimation." Reporting of limitations is also called for and the potential for difference between biological and chronological age is discussed.	No response needed because no suggestion was made by the commenter.	The commenter supports addition to the Registry.	No Response Needed
3	3.15		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Estimated Age Interval:		The estimated age interval expresses the mathematically determined minimum and maximum associated age range at a particular level of uncertainty. Rather than referring in 3.15 to a "particular level of uncertainty," It seems likely that referring to a "stated level of confidence" or a "stated probability level" would be more correct.	This is a valid comment and will be referred to the SDO	We will refer the comment to the SDO for greater clarification during the mandatory review of the TR. We agree with the commenter that this does not prevent this from entering the registry.	No Response Needed
4	3.16		8 members of the OSAC Legal Task Group: Dana Delegr, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Expression of Uncertainty (EoU):		The parameter, associated with the assessment method used, that characterizes the dispersion of the values that could reasonably be attributed to the measurand. This does not seem like a standard term used in the expression of uncertainty in other scientific fields. A more standard term might be measurement uncertainty, which has a similar definition in the International Vocabulary of Metrology (VIM).	Check out this link to NIST: https://physics.nist.gov/cuu/Uncertainty/gloss ary.html This is an ISO defined term and is exactly why we used it as written.	Topic of comment was previously discussed and resolved by subcommittee	Previously considered:
5	3.22		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Level of Uncertainty (LoU)		This characterizes the dispersion of values used for measuring dental age assessment based on the variation within the data. This does not seem like a standard term used in the expression of uncertainty in other scientific fields. A more standard term might be random variability, which is often used to describe the subset of the uncertainty that can be seen in repeated measurements.	Check out this link to NIST: https://physics.nist.gov/cuu//Uncertainty/gloss ary.html This is an ISO defined term and is exactly why we used it as written.	Topic of comment was previously discussed and resolved by subcommittee	Previously considered:
6	5.2		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.			This section has some language about normal distributions and bell curves that likely could be clarified and made to align more closely with other descriptions of statistical models in other areas of scientific and medical research.	This standard is intended for use by competent forensic odontologists with the requisite formal education, disciplinesergific training. It is a common term used to describe a method where the interval is defined in terms of standard deviation from a mean	Comment is not relevant to the subject of document being considered	Not Germane

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7	11.6		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Opinion/Conclusions		The Opinion/Conclusion seems to permit use of reference studies that do not include an assessment of uncertainty in age apparently without any accounting for that in the reported age interval, though the lack of an uncertainty assessment must be reported. A better solution might be to incorporate the uncertainty for comparable study in addition to reporting that the study used did not include an uncertainty assessment and documentation of the uncertainty that was used, the study it came from, and the relationship of the two populations and samples in each study.	This sentence states that if a FO is using a system and it does not include an		Not Persuasive
8 18 18	11.6		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.			The Opinion/Conclusion section lack of reporting of a range of probabilities based on a set of plausible probability models that could have generated the data. This is a potentially large source of uncertainty that could influence the results and has not be mentioned. For more background on this idea, confer with Lund and Iyer (2017) which discusses this issue in terms of the use of likelihood ratios in forensic science or the recent book Noise (2021) by Daniel Kahneman.	The Opinion/Reporting section is only advocating reporting the information that has been published in the methodology. The TR cannot request the reporting of additional information from the methods if it has not been peered reviewed and scientifically validated for that particular method. If that information is lacking, the TR is advocating that that information should be reported. The SDO is aware of the utilization of the likelihood ratio as it is currently being discussed at the ISO TC 272 level. Unfortunately, a consensus opinion on its appropriate use has not yet been reached. However, when ISO 21043-4 and ISO 21043-5 become standards, and if there is a US adoption and inclusion in the OSAC registry, they will be considered.	Comment is not relevant to the subject of document being considered	Not Germane
9	P. 5 Preface		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philipott, Andrea Roth, Barry Scheck, Maneka Sinha.	P. 5 Preface		The document states that "to determine the appropriate use of this assessment by any entity in determining appropriate actions "[i]t is beyond the scope of this document to determine the appropriate use of this assessment by any entity in determining appropriate actions based on the estimated age interval as it relates to the chronological age of any specific individual" or to "recommend the application of the assessment by any user in determining appropriate actions as it relates to chronological age," yet then immediately proceeds to do just that in recommending its use to "assist the legal system in answering questions regarding immigration, legal age of majority, and legal age of license." The preface also advises that the report "is intended for agencies utilizing the age assessment information "Section 10.1.2 reiterates that the techniques have "a useful role in assisting legal authorities in determining the disposition of cases involving immigration, asylum seekers, and legal age of majority or license." Either the document's scope includes recommendations for use or it does not.	The document can be used to make an age interval assessment for any of the outlined purposes.	The concern is outside the scope of the standard as to what <i>actions</i> any entity takes based on those opinions.	Not Germane

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P. S Preface	ş.	8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	P. 5 Preface		The preface also states "However, dental age assessment is based on large identifiable human group populations and has an associated level of uncertainty." Yet nowhere in the document is any description of the potential magnitude of uncertainty made clear. Some guidance to practitioners about what uncertainty is to be expected under differing circumstances would be useful. Particularly important may be an understanding of how uncertainty is affected by the mismatch between available datasets relevant to populations frequently subjected to this technique. If the potential magnitude of uncertainty is unknown by the drafters, the technical report should require that examiners/labs do sufficient testing to estimate that uncertainty before offering conclusions for use by the legal system	Clarification of Comment	This statement aims to stress upon the examiner the importance of selecting an appropriate method and comprehensively reporting the information as outlined in the TR. However, this is a generalized statement since clearly, the incorrect reporting of any forensic conclusion in any forensic specialty can have grave consequences.	Not Persuaive
P. 5		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Background		In addition, the consequences of inappropriate assessment of age can have emotional and legal ramifications. : If inappropriate means "incorrect," that should be made clear. If "inappropriate" means something else, it should be explained.	This is a valid comment and will be referred to the SDO	We will refer the comment to the SDO for greater clarification during the mandatory review of the TR. We do not feel this should prevent this document from entering the registry.	Not Persuaive
P. 5		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck,	Background		The phrase "emotional and legal ramifications" is extremely broad, and to the extent the document intends to discuss the practical results of error, they may go well beyond "emotional" ramifications, including decisions regarding the death penalty, imprisonment in adult facilities, and more.	No response needed because no suggestion was made by the commenter.	We agree that this is a concern, but this is a scientific document, not a professional practice or ethical document. The TR is acknowledging it is out of the scope of the document and, therefore, will not be addressing the issue.	Not Germane
P.5, 2		Amente Sinna. 8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philipott, Andrea Roth, Barry Scheck, Maneka Sinha	Scope Note 2		This is not a legal document and is not intended for that purpose. This statement should be deleted. What is a "legal purpose"? Nothing written in this document could prevent its use in court, and to the extent the document seeks to do so, it is misguided. If what is detailed herein is of value to a forensic practitioner, it should be of value to the legal system seeking to evaluate the evidence produced via its implementation.	The statement is simply stating that it does not make a recommendation as to how the law applies the finding. It would be similar to a technical report for the determination of homicide, not stating how that determination is utilized in a court of law.	Area Discussed is Out of Scope	Not Persuaive
P.6, 3.8	8	8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Chronologic Age		Note: Chronologic age may be expressed in varying degrees of precision and can be derived from computer programs that report age values using multiple significant digits. To correctly interpret and report results, consultation with a statistician may be necessary. Comment: This standard should be deleted or should be changed to require consultation with a statistician before offering any conclusion for use by the legal system." At a minimum, a technical report should explain both how these programs work and how they have been validated with reference to validation studies.	The Preface clearly states the criteria for utilization by the legal system are out of the scope of the document. Therefore, it cannot be addressed. In addition, the TR has made it mandatory only to use peerreviewed, generally accepted methodologies. This process ensures that experts have reviewed the statistical methodology used in the technique. Like other modalities such as DNA, the statistical review is performed when the methodology is created and published, not each time a DNA result on an individual case is published	Area Discussed is Out of Scope	Not Germane

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P. 9, 4.1		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.			The relative contributions of genetic, environmental, and other factors, when examining variability within and between populations has not been established Thoughtful consideration should be given to sex, identifiable human group, geographic population specificity, and environmental factors. Comment: "Thoughtful consideration" does not provide meaningful direction to a practitioner. How these factors affect age estimation must be explained or the practitioner should be given information on how to express the uncertainty that comes from our incomplete knowledge about them.	Like all medical determinations, forensic determinations do not consider the relative contribution of every possible theoretical factor that can contribute to a determination. However, this does not limit their consideration when making diagnostic and therapeutic determinations. This sentence states that currently, no documented evidence established the relative contribution of these factors. This document acknowledges that if an examiner feels a specific mitigating factor exists that should be considered, it can be reported.	The TR is simply stating that there is no documented evidence establishing the relative significance of these factors at the time of publication.	Not Persuasive
P. 9-10 4.3		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.			Practitioners should maintain awareness that self-reported identifiable human groups may be a sensitive, multidimensional concept influencing the reporting of one line of descent Comment: It is unclear what this means. Is it trying to state that that self-reported race and ethnicity can deviate from the underlying genotypes that correlate with studied phenotypes, thus contributing to uncertainty? Or something else?	Yes, that is correct. It states that self- reported race and ethnicity can deviate from the underlying genotypes that correlate with studied phenotypes.	Clarification requested and affirmative response given	Not Germane
P.12, 5.2		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.			The use of databases in the evaluation of tooth maturation and post-developmental dental changes is an essential component of dental age assessment. There is still no uniform consensus concerning the appropriate statistical methodology that considers both the age intervals reported in the tables as well as the age interval among the individual teeth utilized in the assessment. Therefore, the reporting of an appropriate standard deviation methodology is beyond the scope of this document. Comment: Even if no single "standard deviation methodology" can be identified as the best, which ones are reasonable to use? Without addressing this issue, an expert could be criticized as not following any standard practice or consensus.	The appropriate one to use is defined in the individual peer-review method.	Each peer-review method includes the statistical methodology used, and that it is beyond the scope of this document to determine the relative merits of each.	Not Germane
P.12, 5.2		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia			Comment: What is a "standard deviation methodology"? It is not a standard statistical phrase (although the "standard deviation" of a sample and a population are) and should be clearly defined. The mere fact that a variable is normally distributed does not define any statistical method.	It is a common term used to define any method where the interval is expressed in terms of standard deviation from a mean.	This standard is intended for use by competent forensic odontologists and practitioners with the requisite formal education, discipline-specific training.	Not Persuasive
6.1		Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Databases		The desired attributes of a database include: Comment: An appropriate sampling method is missing from the list.	The appropriate sampling method is based on the type of methodology used in the analysis and can vary from method to method.	Since the TR is advocating only methodologies that have been peer-reviewed for their adequacy, the concerns raised by the commenter would typically be addressed at that time	Not Germane

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6.4		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Validation Studies		Comment: This section suggests but does not say that validation studies on various databases do not yet exist ("Testing the reliability of the reference datasets and methodologies to an unrelated population-specific database of a statistically appropriate size and with subjects of a confirmed chronological age can be an important tool for evaluating the dental age assessment process."). Regardless of whether this document can point to an error rate that might be acceptable for legal purposes, that these validation studies have not been done and thus uncertainty not yet known, must be made more clear within the text of the document.	The TR does not address the existence or lack of existence of validation studies; it simply encourages their use as an essential tool in reviewing and validating the process. Age tables are created by recording the development stage of a tooth and the chronological age of an individual to create a distribution table.	This type of study is a ubiquitous practice in medicine and is analogous to measuring height at a specific age to create a distribution table. As you are aware, therapeutic decisions based on these calculations are routinely performed.	Not Germane
9		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Dental Radiology		Although the primary objective in obtaining radiographs is for age estimation, practitioners are bound by ethical and clinical best practices when assessing subjects. Even though this is a nonmedical or dental referral, the primary responsibility is to ensure that the individual is provided appropriate and accurate information for an individual to give informed consent. Comment: Given that one of the major uses of this technique is examining minors at the behest of government agencies seeking to prove that the ostensible minors are in fact adults, a discussion about the ethical implications of taking non-medical x-rays (and creating non-medical radiation exposure) is warranted. Further discussion about whether informed consent can even be given under such circumstances, and by whom, is also called for here.		Area Discussed is Out of Scope	Not Germane
10.1		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman.	Atlas		"Atlas techniques" is a specialized term that should be defined in this guide to the available methods for age assessment.	No response needed	We feel atlas technique is sufficiently defined and described in section 10.1	Not Persuasive
10.1.1		Lynn Garcia, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha. 8 members of the OSAC Legal Task Group: Dana Delger,	Infant/Child		As in section 9, a discussion of the ethical implications surrounding consent under these circumstances is required. The document should clarify how these ethical questions interact with the document's command that "Where the age is not known, the benefit of the doubt should prevail, and he or she is presumed to be a child." Presumably, any case where a dental age assessment is being done is one in which age is at least in question, so direction to the practitioner about who consent can be sought from and under what circumstances is necessary.	We agree that this is a concern, but this is a scientific document, not a professional practice or ethical document.	The TR is acknowledging that it is out of the document's scope and out of the SDO scope. However, The FO SC would strongly support OSAC to create such documents.	Not Germane
10.1.2		Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha. 8 members of the	Adolescent		Although the third molar exhibits the highest degree of morphologic developmental variability, it remains extremely useful in the assessment of age. Comment: Some explanation about how, despite "the highest degree of morphologic developmental variability," this tooth can be used (and be useful) in assessment of age is warranted.	Third molars are the last dental developmental morphologic predictor of age. Developing teeth, even those with the highest degree of variability, can provide a more narrow age interval than most post formation dental techniques or skeletal techniques	We feel this is self-explanatory.	Not Persuasive
11.2		OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Case Identification Data		Case Identification Data This section includes a case identification number and if any age-related legal documents were presented at the date of subject examination, birth certificate, antional identification, passport, vaccination certificate, etc. Comment: These documents are plainly biasing and have no bearing on the biologic age that the practitioner is ostensibly determining. While they should certainly be noted in a report if presented, the document should at least note they should not be seen and why.	This section of the TR states that they must be submitted with the case if these documents exist. This section does not specify when that reviewer should receive the documents nor even deals with cognitive bias. Therefore, it would be inappropriate to be placed here.	We will refer the comment to the SDO for consideration during the mandatory review of the TR. We do not feel this comment should prevent the document from being placed in the registry.	Not Persuasive

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1 Section 11.3	Page	8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	entorial of Technical	Attached File	Biogeographical Information regarding the Individual Also, include a written note regarding the mental and cognitive ability of the individual in question, their general status, and their height and weight. Comment: Nothing in this document indicates that dental age assessment practitioners have expertise in determining the "mental and cognitive ability" of an individual, and beyond addressing the person's apparent general ability to understand and answer questions (particularly as they relate to informed consent), practitioners should not include such judgments in their reports.	The TR is simply stating that if the information is available, it should be supplied. It does not state that the FO examiner should assess or review the information.	We feel this is self-explanatory.	Not Germane
11.6		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Opinion/Conclusions		This section summarizes the practitioner's results. The final age assessment is a matter of the practitioner's expert judgment by synthesizing all available information. Comment: "The final age assessment" should, even according to this document, be based on the data and the comparison to the reference populations," not merely be a "matter of the practitioner's expert judgment."	Response to Comment	Although the actual reporting of a result is a quantitative opinion, the methodology selected, and the quality of the radiographs are qualitative judgments. This sentence is simply stating that the reporting of a number is insufficient that the practitioner must use their expert judgment to assess that the entire process was done correctly	Not Persuasive - Explanation Provided
11.6			Opinion/Conclusions		Comment: As is clear in the document, at least some of the information available to the practitioner is inappropriately biasing, and should not be included.	No response needed because no suggestion was made by the commenter.	Area Discussed is Out of Scope	Not Persuasive
11.6		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Opinion/Conclusions		Conclusion statements specific to each methodology employed includes estimated age, it's corresponding level of uncertainty, and an estimated age interval. If a reference study utilized to assess chronologic age does not provide this, then state it in the forensic report. For cases involving immigration, asylum seekers, and legal age of majority or license, include a probability statement that the individual has attained the age in question. When statistical mean age and standard deviation are known, statistical probability can be calculated. Comment: If a cited reference study does not include a methodology, its level of uncertainty, or estimated age interval and is nonetheless used, the practitioner should explain why it does not and why it is still suitable.	and shortfalls of different methods but simply to be certain that they are appropriately reported.	However, we will refer the comment to the SDO for the possible need for greater clarification during the mandatory review of the TR. We do not feel this comment should prevent the document from being placed in the registry.	Not Persuasive - Refer to the SDO
11.6		8 members of the OSAC Legal Task Group: Dana Delger, Jennifer Friedman. Lynn García, Julia Leighton, Kate Philpott, Andrea Roth, Barry Scheck, Maneka Sinha.	Opinion/Conclusions		Comment: It is scientifically inappropriate for practitioners to provide a "probability statement that the individual has attained the age in question." Whether an individual has attained an age in question requires a consideration of all the evidence, which includes materials outside of a dental examination (for example, school records). It would be more appropriate for a practitioner to provide a probability statement about observing this state of dentition if an individual had or had not reached an age in question. Inverting these likelihoods to arrive at a probability for the age would require a Bayesian analysis that is not discussed in this report. Indeed, there is no clear description of the statistical methods that are proposed and how to describe the reported quantities in reports or in testimony. Are the intervals in question tolerance intervals? Prediction intervals? Confidence intervals? If so, how should the interval be computed, and how should "confidence" be explained?	As the document states, these issues are addressed in the individual methodologies themselves. The commenter is referred to accept method for a fully response to these	It is beyond the scope of this document to list and describe all methodologies. Each peer-review method includes the statistical methodology used, and that it is beyond the scope of this document to determine the relative merits of each.	Not Germane - Explanation Provided