

2026 ABFA Analyst Competencies & Reading List

This document contains sources suitable for helping examinees to prepare to demonstrate proficiency of the ABFA Analyst Competencies. Because the ABFA Exam Development Committee (EDC) strives to maintain a balance between assessing the competencies required of board-certified practitioners and generating a manageable reading list for examinees, the reading list is not an exhaustive list of forensic anthropology literature that may be useful in preparing for the exam.

Each section of this list (Topics 1-16) provides the Analyst Competencies, followed by recommended preparation materials (*References*). In general, entire books will be used to develop “general knowledge questions” while specific chapters or articles will be linked to questions that are more specific to that publication.

Be aware that each Reference is provided only once but can address competencies in different topic areas and exam questions are not limited to the topic in which the Reference is listed. For example, References listed in the “Bio Profile” section may have an exam question related to an “Anatomy” or “Statistics” competency. Multiple references may also be listed for the same competency (e.g., multiple books on juvenile development/osteology) to provide options based on availability and preference. The Historical Publications at the end of this document are useful for understanding the development and application of recent methods, but exam questions will not come directly from these sources.

It is not expected that examinees will read every Reference in its entirety, nor will doing so guarantee that an individual is adequately prepared to sit for the Analyst Exam. Depending on your specific education, training, and experience, you may choose to spend more or less time on each of the References. Ultimately, the key to studying is to focus on the competencies and whether you have the appropriate knowledge, skill, or ability noted.

General Reference Books for Forensic Anthropology

The following books provide broad overviews of topics within the field of forensic anthropology. In many cases, chapters of these books describe and/or summarize specific references from the reading list, which examinees may find useful. Any examination material that comes from these books would be considered general, foundational knowledge in the discipline. Some of these books have specific chapters listed in "References" in Topics 1-16 from which specific exam questions were derived.

Blau, S., and D. H. Ubelaker, eds. (2016) *Handbook of Forensic Archaeology and Anthropology* (2nd ed.). Routledge, NY.

Boyd, C.C., and D.C. Boyd. (2018). *Forensic Anthropology: Theoretical Framework and Scientific Basis*. Wiley, Hoboken, NJ.

Christensen, A. M., Passalacqua, N. V., and E. J. Bartelink (2019) *Forensic Anthropology: Current Methods and Practice*, 2nd Edition. Academic Press, NY.

DiGangi, E. A., and M. K. Moore, eds. (2013) *Research Methods in Human Skeletal Biology*. Academic Press, Amsterdam.

Dirkmaat, D. C., ed. (2012) *A Companion to Forensic Anthropology*. Wiley-Blackwell, Chichester, UK.

Langley, N. R., and MT Tersigni-Tarrant, eds. (2017) *Forensic Anthropology: A Comprehensive Introduction*. CRC Press, Boca Raton, FL.

1. Anatomy (gross anatomy, human osteology, comparative osteology, skeletal biology, histology)

A1.1	Differentiate between osseous and non-osseous material
A1.2	Know bone composition and basic biomechanical properties of bone
A1.3	Identify and side elements and teeth (complete and fragmentary, fetal through adult age)
A1.4	List differences among and be able to interpret tooth numbering systems
A1.5	Be familiar with landmark definitions and identify locations (landmarks, muscle attachments, protuberances, etc.)
A1.6	Collect osteometric data (take measurements)
A1.7	Differentiate human and nonhuman remains (complete and fragmentary)
A1.8	Describe skeletal growth and development (endochondral vs. intramembranous, epiphyseal union, dental development and eruption)
A1.9	Recognize histological features in bone
A1.10	Explain the processes of modeling/remodeling, including the cell types involved in these processes
A1.11	Describe the microscopic structure of bone and the function and cellular precursors of bone cells (osteoblasts, osteocytes, and osteoclasts)
A1.12	Explain bone histology sampling procedures (e.g. sampling sites)
A1.13	Summarize the development of skeletal ossification centers and epiphyses, including timing, sequence, and sexual dimorphism

References

Adams, B. and P. Crabtree (2012) Comparative Osteology: A Laboratory and Field Guide of Common North American Animals. Academic Press, Waltham, MA. [A1.7]

Baker, B. J., T. L. Dupras, and M. W. Tocheri (2005) The Osteology of Infants and Children. Texas A&M University Press, College Station, TX. [A1.3, A1.8, A1.13]

Crowder, C., and S. Stout, eds. (2012). Bone Histology: An Anthropological Perspective. CRC Press, Boca Raton, FL. [A1.1, A1.2, A1.7, A1.9, A1.10, A1.11, A1.12]

Cunningham C., Scheuer L., and Black S. (2016). Developmental Juvenile Osteology, 2nd Edition. Academic Press, San Diego, CA. [A1.3, A1.8, A1.13]

France, D. L. (2008) Human and Nonhuman Bone Identification: A Color Atlas. CRC Press, Boca Raton, FL. [A1.7]

France, D. L. (2017) Comparative Bone Identification: Human Subadult to Nonhuman. CRC Press, Boca Raton, FL. [A1.3, A1.7]

Jantz, R. L., and S. Ousley (2005) FORDISC 3.1. University of Tennessee Press, Knoxville, TN. [Including the program itself and the included Help Guide] [A1.5, A1.6; A2.1, A2.2]

Moore, K. L., A. F. Dalley, and A. M. R. Agur (2013) Clinically Oriented Anatomy (7th ed.). Walters Kluwer, Baltimore, MD. Or any other general anatomy textbook. [A1.2, A1.5, A1.8, A1.11, A1.13]

Plemons, A. M., Kamnikar, K. R., Goots, A. G., and J. A. Biggs (2023). Landmark and Measurement-Based Data Assistant (LAMBDA): A Pedagogical Tool for Cranial Landmark Data Collection. Forensic Anthropology 6(2): 92-98. <https://locatelambda.org/> [A1.5, A1.6]

Scheuer, L., and S. Black (2004) The Juvenile Skeleton. Elsevier Press, Amsterdam. [A1.3, A1.8, A1.13]

Schaefer, M., S. Black, and L. Scheuer (2009) Juvenile Osteology: A Laboratory and Field Manual. Academic Press, Amsterdam. [A1.3, A1.8, A1.13]

White, T. D., M. T. Black, and P. A. Folkens (2012) Human Osteology (3rd ed.). Academic Press, San Diego, CA. [A1.1, A1.2, A1.3, A1.4, A1.5, A1.6]

White, T., and P. Folkens (2005) The Human Bone Manual. Academic Press, Amsterdam. [A1.1, A1.2, A1.3, A1.4, A1.5, A1.6]

2. Bioprofile

A2.1	Score, measure, and record metric and morphoscopic/morphological variables according to accepted and defined procedures for estimating bioprofile parameters
A2.2	Use software programs relevant to bioprofile analyses

References

AAFS Academy Standards Board (ASB): <https://www.aafs.org/search/standards>

- Std. 045, 1st Ed. (2019). Standard for Stature Estimation in Forensic Anthropology.
- Std. 090, 1st Ed. (2019). Standard for Sex Estimation in Forensic Anthropology.
- Std. 132, 1st Ed. (2023). Standard for Population Affinity Estimation in Forensic Anthropology.
- Std. 133, 1st Ed. (2024). Standard for Age Estimation in Forensic Anthropology.

AlQahtani, S. J., Hector, M. P., & Liversidge, H. M. (2010). Brief communication: the London atlas of human tooth development and eruption. *American Journal of physical anthropology*, 142(3), 481-490. [A2.1]

AlQahtani, S. J. (2009) Atlas of human tooth development and eruption. Queen Mary and Westfield College, London. (www.atlas.dentistry.qmul.ac.uk.) [A2.1, A2.2]

Auerbach, B. M. (2011) Methods for estimating missing human skeletal element osteometric dimensions employed in the revised Fully technique for estimation stature. *American Journal of Physical Anthropology* 145:67-80. [A2.1]

Berg, G. E. and M. W. Kenyhercz (2017) Introducing human mandible identification [(hu)MANid]: A free, web-based GUI to classify human mandibles. *Journal of Forensic Sciences* 62(6):1592-1598. [A2.1, A2.2]

Boldsen J. L., Milner, G. R., Konigsberg, L. W., & Wood, J. W. (2002). Transition analysis: A new method for estimation age from skeletons. In: Hoppa, R.D., Vaupel, J.W., editors. *Paleodemography: Age distributions from skeletal samples*. Cambridge: Cambridge University Press. P 73-106. [A2.1, A2.2]

Brůžek, J., Santos, F., Dutailly, B., Murail, P., & Cunha, E. (2017). Validation and reliability of the sex estimation of the human os coxae using freely available DSP2 software for bioarchaeology and forensic anthropology. *American journal of physical anthropology*, 164(2), 440-449.

Hartnett, K. M. (2010) Analysis of age-at-death estimation using data from a new, modern autopsy sample—Part I: Pubic bone. *Journal of Forensic Sciences* 55:1145-1151. [A2.1]

Hartnett, K. M. (2010) Analysis of age-at-death estimation using data from a new, modern autopsy sample—Part II: Sternal end of the fourth rib. *Journal of Forensic Sciences* 55:1152-1156. [A2.1]

Hefner, J. T. (2009) Cranial nonmetric variation and estimating ancestry. *Journal of Forensic Sciences* 54:985-995. [A2.1]

- Hefner, J. T. (2018) The Macromorphoscopic Databank. *American Journal of Physical Anthropology* 166:994-1004. [A2.1, A2.2]
- Hefner, J.T., and Linde, K.C. (2018). *Atlas of Human Cranial Macromorphoscopic Traits*. Academic Press, San Diego, CA. [A2.1, A2.2]
- Jantz, R. L., L. M. Jantz, S. D. Ousley 2020. Measuring the Tibia: Trotter's Error Revisited. *Journal of Forensic Sciences* 65:2094-2097 [A2.1]
- Klaes AR, and Cole SJ. 2018. MorphoPASSE: the Morphological Pelvis and Skull Sex Estimation Database Manual. Version 1.0. Topeka, KS: Washburn, University. [Including the program: <https://www.morphopasse.com/program.html>] [A2.1, A2.2]
- Langley-Shirley, N., and R. L. Jantz (2010) A Bayesian approach to age estimation in modern Americans from the clavicle. *Journal of Forensic Sciences* 55:571-583. [A2.1]
- Langley, N. R., Jantz, L. M., Ousley, S. D., Jantz, R. L., & Milner, G. (2016). Data collection procedures for forensic skeletal material 2.0. University of Tennessee and Lincoln Memorial University. [A1.5, A1.6, A2.1, A2.2]
- Lewis, C. J., and H. M. Garvin (2016) Reliability of the Walker cranial nonmetric method and implications for sex estimation. *Journal of Forensic Sciences* 61:743-751. [A2.1]
- Osborne, D. L., T. L. Simmons, and S. P. Nawrocki (2004) Reconsidering the auricular surface as an indicator of age at death. *Journal of Forensic Sciences* 49:905-911. [A2.1]
- Ousley, S. D. and R. L. Jantz (2012) Fordisc 3 and statistical methods for estimating sex and ancestry. In *A Companion to Forensic Anthropology*, ed. by D. C. Dirkmaat, pp. 311-329. Wiley-Blackwell, Chichester, UK. [A2.1, A2.2]
- Raxter, M. H., B. M. Auerbach, and C. B. Ruff (2006) Revision of the Fully technique for estimating stature. *American Journal of Physical Anthropology* 130:374-384. [A2.1]
- Scott, G. R., M. A. Pilloud, D. Navega, J. d'Oliveira Coelho, E. Cunha, and D. J. Irish (2018) rASUDAS: A new web-based application for estimating ancestry from tooth morphology. *Forensic Anthropology* 1(1):18-31. [Including the program: <https://osteomics.com/rASUDAS/>] [A2.1, A2.2]
- Shirley, N. R., and R. L. Jantz (2011) Spheno-occipital synchondrosis fusion in modern Americans. *Journal of Forensic Sciences* 56:580-585.[A2.1]
- Spradley, M. K., and R. L. Jantz (2011) Sex estimation in forensic anthropology: Skull versus postcranial elements. *Journal of Forensic Sciences* 56:289-296. [A2.1]
- Turner, C. G., II, C. R. Nichol, and G. R. Scott (1991) Scoring procedures for key morphological traits of the permanent dentition: The Arizona State University Dental Anthropology System. In *Advances in Dental Anthropology* ed. by M. A. Kelley and C. S. Larsen, pp. 13-31. Wiley-Liss, New York. [A3.4] [Note: Examinees only need to know morphological traits as they relate to forensic anthropological methods - updated scoring definitions for some rASUDAS traits can be found in Scott, G. R., J. D. Irish (2017). [A2.1, A2.2]]

3. Trauma

A3.1	Describe classic characteristics of major classes of skeletal trauma
A3.2	Describe characteristics of skeletal trauma timing
A3.3	Recognize typical fracture patterns related to trauma classes
A3.4	Recognize typical fracture and burn patterns related to thermal alteration
A3.5	Differentiate traumatic changes to bone from normal skeletal variants, taphonomic and pathological changes, including common sources of pseudotrauma

References

ANSI/ASB Std. 147, 1st Ed. (2024). Standard for Analyzing Skeletal Trauma in Forensic Anthropology. <https://www.aafs.org/search/standards>

Berryman, H. E. (2019). A systematic approach to the interpretation of gunshot wound trauma to the cranium. *Forensic science international*, 301, 306-317. [A3.1, A3.3]

Berryman, H. E., J. F. Berryman, and T. B. Saul (2018) Bone trauma analysis in a forensic setting: theoretical basis and a practical approach for evaluation. In *Forensic Anthropology: Theoretical Framework and Scientific Basis*, ed. by C. C. Boyd and D. C. Boyd, pp. 213-234. [A3.1, A3.3]

Christensen, A. M., V. A. Smith, V. Ramos, C. Shegogue, and M. Whitworth (2012) Primary and secondary skeletal blast trauma. *Journal of Forensic Sciences* 57:6-11. [A3.3]

Fleischman JM, Soto Martinez ME, Wiersema JM, Pinto DC. (2020). The Role of the Forensic Anthropologist in the Pediatric Autopsy: Interpretations, Contributions, and Challenges. *WIREs Forensic Science* 2020;31389. [A3.1, A3.2, A3.3, A3.5]

Glassman, D. M., and R. M. Crow (1996) Standardization model for describing the extent of burn injury to human remains. *Journal of Forensic Sciences* 41:152-154. [A3.4]

Hart G. O. (2005) Fracture pattern interpretation in the skull: Differentiating blunt force from ballistics trauma using concentric fractures. *Journal of Forensic Sciences* 50(6):1276-1281. [A3.1, A3.3]

Herrmann, N. P., and J. L. Bennett (1999) The differentiation of traumatic and heat-related fractures in burned bone. *Journal of Forensic Sciences* 44:461-469. [A3.1, A3.3]

L'Abbé, E. N., Symes, S. A., Raymond, D. E., & Ubelaker, D. H. (2019). The Rorschach butterfly, understanding bone biomechanics prior to using nomenclature in bone trauma interpretations. *Forensic science international*, 299, 187-194. [A3.1; A3.4]

Love, J. C. (2019). Sharp force trauma analysis in bone and cartilage: A literature review. *Forensic science international*, 299, 119-127. [A3.1, A3.3]

Love, J. C., S. M. Derrick, and J. M. Wiersema (2011) *Skeletal Atlas of Child Abuse*. Humana Press, New York. [A3.2, A3.3, A3.5]

Quatrehomme, G., & Alunni, V. (2019). The link between traumatic injury in soft and hard tissue. *Forensic science international*, 301, 118-128. [A3.1; A3.3]

Sorg, M. H. (2019). Differentiating trauma from taphonomic alterations. *Forensic science international*, 302, 109893. [A3.5]

Symes, S. A., E. N. Chapman, C. W. Rainwater, L. L. Cabo, and S. M. T. Myster (2010) *Knife and Saw Toolmark Analysis in Bone: A Manual Designed for the Examination of Criminal Mutilation and Dismemberment*. Report, National Institute of Justice, Grant 2005-I-J-CX-K106. [A3.1, A3.3]

Symes, S. A., C. W. Rainwater, E., N. Chapman, D. R. Gipson, and A. I. Piper (2015) Patterned thermal destruction in a forensic setting. In *The Analysis of Burned Human Remains*, ed. by C. W. Schmidt and S. A. Symes, pp. 17-56. Academic Press, Amsterdam. [A3.1, A3.2, A3.3, A3.4, A3.5]

Wedel, V. L., and A. Galloway, eds. (2014) *Broken Bones: Anthropological Analysis of Blunt Force Trauma* (2nd ed.). Charles C Thomas, Springfield IL. [A3.1, A3.2, A3.3, A3.5]

4. Pathological Conditions and Anomalies

A4.1	Describe classic characteristics of common pathological conditions affecting bone
A4.2	Describe classic characteristics of common anatomical variants and skeletal anomalies

References

ANSI/ASB Std. 134, 1st Ed. (2021). Standard for Analyzing Pathological Conditions and Anomalies in Forensic Anthropology. <https://www.aafs.org/search/standards>

Aufderheide, A. C., and C. Rodríguez-Martín (1998) The Cambridge Encyclopedia of Human Paleopathology. Cambridge University Press, Cambridge. [A4.1]

Barnes, E. (2012) Atlas of Developmental Field Anomalies of the Human Skeleton: A Paleopathology Perspective. Wiley & Sons, Hoboken, NJ. [A4.1]

Biehler-Gomez L., and C. Cattaneo. (2021) Interpreting Bone Lesions and Pathology for Forensic Practice. Academic Press, San Diego, CA. [A4.1]

Buikstra, J. (Ed.). (2019). Ortner's identification of pathological conditions in human skeletal remains. Academic Press, UK. Earlier versions of Ortner contain similar information.

Mann, R. W., & D.R. Hunt (2019). Non-metric traits and anatomical variants that can mimic trauma in the human skeleton. Forensic Science International, 301, 202-224. [A3.5, A4.1, A4.2]

Mann, R. W., & D.R. Hunt (2012) Photographic Regional Atlas of Bone Disease: A Guide to Pathologic and Normal Variation in the Human Skeleton (3rd ed.). Charles C Thomas, Springfield, IL. [A4.1, A4.2]

Mann, R.W., D.R.Hunt, & S. Lozanoff. (2016). Photographic Regional Atlas of Non-Metric Traits and Anatomical Variants in the Human Skeleton. Charles C Thomas, Springfield, IL. [A4.1, A4.2]

Ortner, D. J. (2012) Differential diagnosis and issues in disease classification. In A Companion to Paleopathology, ed. by A. L. Grauer, pp. 250-267. Wiley-Blackwell, Malden, MA. [A4.1, A4.2]

5. Taphonomy and the Postmortem Interval

A5.1	Describe general characteristics of taphonomic features (e.g., scavenging, weathering, alterations resulting from coffin burial, trophy preparation, anatomical preparation)
A5.2	Describe the stages of soft tissue decomposition and bone diagenesis and how variables (scavenging, environmental, climatic, etc.) affect the rate of decomposition and estimation of postmortem interval

References

ANSI/ABS Std. 149, 1st Ed. (2024). Standard for Taphonomic Observations in Support of the Postmortem Interval. <https://www.aafs.org/search/standards>

Haglund, W. D. (1992) Contribution of rodents to postmortem artifacts of bone and soft tissue. *Journal of Forensic Sciences* 37:1459-1465. [A5.1, A5.2]

Haglund, W. D., and M. H. Sorg, eds. (1997) *Forensic Taphonomy: The Postmortem Fate of Human Remains*. CRC Press, Boca Raton, FL. [A5.1, A5.2]

Megyesi, M. S., S. P. Nawrocki, and N. H. Haskell (2005) Using accumulated degree-days to estimate the postmortem interval from decomposed human remains. *Journal of Forensic Sciences* 50:618-626. [A5.2]

Moffatt, C., T. Simmons, and J. Lynch-Aird (2016) An improved equation for TBS and ADD: Establishing a reliable postmortem interval framework for casework and experimental studies. *Journal of Forensic Sciences* 61(S1):S201-S207. [A5.2]

Pokines, J. T., E.N. L'Abbe, and S. A. Symes, eds. (2021) *Manual of Forensic Taphonomy*. 2nd Edition. CRC Press, Boca Raton, FL. [A5.1]

Ubelaker, D. H., and K. M. Zarenko (2011) Adipocere: What is known after over two centuries of research. *Forensic Science International* 208:167-172. [A5.1, A5.2]

Wescott, D. J. (2018). Recent advances in forensic anthropology: decomposition research. *Forensic sciences research*, 3(4), 278-293. [A5.2]

6. Forensic or Medicolegal Significance

A6.1	Determine medicolegal significance of remains based on basic anatomy/physical characteristics.
A6.2	Recognize the importance of context for in situ remains

References

ANSI/ASB Std. 150, 1st Ed. (2021). Standard for Determination of Medicolegal Significance from Skeletal Remains in Forensic Anthropology. <https://www.aafs.org/search/standards>

Pokines, J.T. (2018) Differential diagnosis of the taphonomic histories of common types of forensic osseous remains. *Journal of Forensic Identification* 68:87-145. [A5.1, A6.1, A6.2]

Pokines J. T. Taphonomic characteristics of former anatomical teaching specimens received at a medical examiner's office. *Journal of Forensic Identification* 2015;65:173-195. [A5.1, A6.1, A6.2]

Pokines, J. T., D. P. Zinni, and K. Crowley (2016) Taphonomic patterning of cemetery remains received at the Office of the Chief Medical Examiner, Boston, Massachusetts. *Journal of Forensic Sciences* 61(S1):S184-S189. [A5.1, A6.1, A6.2]

Yucha, J. P., J. T. Pokines, and E. J. Bartelink (2017) A comparative taphonomic analysis of 24 trophy skulls from modern forensic cases. *Journal of Forensic Sciences* 62:1266-1278. [A5.1, A6.1, A6.2]

7. Field Recovery

A7.1	Describe common search methods (line search, etc.) and explain/justify the selection of a particular search method given common scene/environmental conditions
A7.2	Describe the appropriate tools, equipment, software, and techniques to document remains at a scene
A7.3	Define common archaeological terms, principles and excavation techniques

References

ANSI/ASB Std. 135, 1st Ed. (2023). Standard for Scene Detection and Processing in Forensic Anthropology. <https://www.aafs.org/search/standards>

ANSI/ASB BPR 008, 1st Ed. (2021). Mass Fatality Scene Processing: Best Practice Recommendations for the Medicolegal Authority. From the Mass Fatality Management and Disaster Victim Identification (MFM-DVI) Consensus Body. <https://www.aafs.org/search/standards>

Dupras, T. L., J. J. Schultz, S. M. Wheeler, and L. J. Williams (2012) Forensic Recovery of Human Remains: Archaeological Approaches (2nd ed.). CRC Press, Boca Raton, FL. [A7.1, A7.2, A7.3]

Hochrein, M.J. (2012). Ch. 5: Perspective: Collecting Evidence in the Context of Criminal Incident. In: A Companion to Forensic Anthropology (1st ed.) ed by D.C. Dirkmaat, pp. 101-112. [A7.1, A7.2, A7.3]

Holland, T. D. and S. V. Connell (2016) The search for and detection of human remains. In: Handbook of Forensic Anthropology and Archaeology (2nd ed.) ed by S. Blau and D. H. Ubelaker, pp. 167-180. Routledge, New York. [A7.1, A7.2, A7.3]

Renfrew, C., and P. Bahn (2019) Archaeology: Theory, Methods and Practice (6th ed.). Thames and Hudson, New York. [Note: Terminology and theoretical principles only - older editions are likely to contain similar information]. [A7.3]

8. Processing

A8.1	Describe appropriate methods to process remains for skeletal analysis
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References

ANSI/ASB Std. 135, 1st Ed. (2023). Standard for Scene Detection and Processing in Forensic Anthropology. <https://www.aafs.org/search/standards>

OSAC 2021-N-0010. Standard for Skeletal Preparation and Sampling in Forensic Anthropology. (2023) Version: 2.1 (<https://www.nist.gov/system/files/documents/2023/12/21/OSAC%202021-N0010%20Standard%20for%20Skeletal%20Preparation%20and%20Sampling%20in%20Forensic%20Anthropology%20Version%202.1.pdf>) [A8.1]

Armelli K., Christensen E., Isaac C., and Cornelison J. (2022). Steam Kettle Skeletal Preparation: An Efficient Method for Processing Human Remains. *Forensic Anthropology* 5:73-77. [A8.1]

Couse T, Connor M. (2015). A comparison of maceration techniques for use in forensic skeletal preparations. *Journal of Forensic Investigation* 3:1-6. [A8.1]

Dunn, R., Spiros, M., Passalacqua, N., & Hefner, J. (2023). Maceration Techniques for Human Fetal and Perinatal Bone. *Forensic Anthropology*, 6(3), 166-173. [A8.1]

Fenton, T. W., W. H. Birkby, and J. Cornelison (2003) A fast and safe non-bleaching method for forensic skeletal preparation. *Journal of Forensic Sciences* 48:274-276. [A8.1]

Lee, E. J., J. G. Luedtke, J. L. Allison, C. E. Arber, D. A. Merriwether, and D. W. Steadman (2010) The effects of different maceration techniques on nuclear DNA amplification using human bone. *Journal of Forensic Sciences* 55:1032-1038. [A8.1; A10.9]

Sanger Ciarleglio, J. E., Perez, K. M., Motola, H. L., & DiGangi, E. A. (2020). Recommendations for maintaining a Dermestid beetle colony (*Dermestes maculatus*) for processing human remains. *Journal of Forensic Sciences*, 65(5), 1698-1703. [A8.1]

Simonsen, K. P., A. R. Rasmussen, P. Mathisen, H. Petersen, and F. Borup (2011) A fast preparation of skeletal materials using enzyme maceration. *Journal of Forensic Sciences* 56:480-484. [A8.1]

9. MNI and Commingled Assemblages

A9.1	Sort commingled remains
A9.2	Determine the minimum number of individuals following best practices in the discipline

References

ANSI/ASB Std. 146, 1st Ed. (2021). Standard for Resolving Commingled Remains in Forensic Anthropology. <https://www.aafs.org/search/standards>

Byrd, J. E., & Adams, B. J. (2016). Analysis of commingled human remains. In Handbook of forensic anthropology and archaeology (pp. 226-242). Routledge. [A9.1, A9.2]

Konigsberg, L. W., & Adams, B. J. (2014). Estimating the number of individuals represented by commingled human remains: a critical evaluation of methods. In Commingled human remains (pp. 193-220). Academic Press.[A9.1, A9.2]

Palmiotto, A., Brown, C. A., & LeGarde, C. B. (2019). Estimating the number of individuals in a large commingled assemblage. Forensic Anthropology 2(2):129-138. [A9.2]

Palmiotto, A., Maijanen, H., LeGarde, C. B., & Ingvaldstad, M. (2024). Advances in commingled human remains analysis between 2014 and 2023. Journal of Forensic Sciences, 69(5), 1604-1619. [A9.1, A9.2]

10. Personal Identification

A10.1	Identify features useful for personal ID (e.g. frontal sinus, sternotomy wires, dental fillings and implants) on radiologic images and/or skeletal remains
A10.2	Define radiologic imaging terminology (e.g. radiolucency, radiopacity, radiodensity, etc.)
A10.3	Differentiate hard and soft tissues on imaging
A10.4	Identify skeletal landmarks and features on imaging
A10.5	Describe basic uses of isotopic testing
A10.6	List the most suitable elements for isotopic analyses
A10.7	Identify gross and radiographic characteristics indicative of osseous healing (i.e., sclerosis, new bone formation)
A10.8	Utilize appropriate identification terminology (i.e. “consistent with”, “exclusion”)
A10.9	Discuss the factors influencing the recovery of DNA from soft and skeletal tissue
A10.10	List the sampling priority of tissues (blood, muscle, tooth/bone) for DNA testing to obtain appropriate samples for DNA extraction

References

ANSI/ASB BPR 089, 1st Ed. (2020). Best Practice Recommendation for Facial Approximation in Forensic Anthropology. <https://www.aafs.org/search/standards>

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11. Statistics

A11.1	Understand foundational concepts in statistics, including standard terminology (e.g., range, interval, standard deviation, mean), types of data (e.g., ordinal, continuous), and basic analyses (e.g., univariate vs. multivariate, discriminant function analysis, linear regression, etc.).
A11.2	Report appropriate statistical information with method results (e.g., intervals, accuracy, probability, confidence level, a priori).

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12. Documentation (Basic Forensic Science)

A12.1	Compile appropriate data and observations in bench notes
A12.2	Explain the function of bench notes in forensic casework
A12.3	Photo-document skeletal evidence.

References

Houck, M. M., & Siegel, J. A. (2009). Fundamentals of forensic science. Academic Press.[A12.1, A12.2, A12.3]

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13. Evidence Handling (Basic Forensic Science)

A13.1	Explain the importance of the chain of custody
A13.2	Describe appropriate chain of custody procedures

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ASTM International Forensic Science Standards (listed below) are available at no cost to practitioners. To access the recommended standards below, examinees need to create an ASTM account or login to an existing account here: <https://www.nist.gov/osac/astm-launch-code>

- ASTM International E1492-11. (2017). Standard Practice for Receiving, Documenting, Storing, and Retrieving Evidence in a Forensic Science Laboratory. [A13.2]
- ASTM International E1459-24. Standard Guide for Physical Evidence Labeling and Related Documentation. [A13.2]
- ASTM International E860-22. Standard Practice for Examining And Preparing Items That Are Or May Become Involved In Criminal or Civil Litigation. [A13.1]

14. Professional Standards, Laboratory Operations, & Accreditation

A14.1	Explain professional standards and guidelines for best practices in Forensic Anthropology, including ANSI/ASB published Standards and Best Practices Recommendations, OSAC-proposed documents.
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References

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AAFS Academy Standards Board (ASB): <https://www.aafs.org/search/standards> [A14.1]

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15. Legal Issues, including Expert Testimony & Courtroom Procedures

A15.1	Summarize landmark court decisions and relevant Federal Rules of Evidence, including how they impact expert witness testimony, evidentiary standards for admissibility, and forensic anthropology practice.
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References

Brady v. Maryland, 373 U.S. 83 (1963);

https://scholar.google.com/scholar_case?case=9550433126269674519&hl=en&as_sdt=6,44&as_vis=1 [A15.1]

Bullcoming v. New Mexico, 564 U.S. 647 (2011); 09-10876 Bullcoming v. New Mexico (06/23/2011) <https://supreme.justia.com/cases/federal/us/564/647/> [A15.1]

Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993)

<https://supreme.justia.com/cases/federal/us/509/579/case.pdf> [A15.1]

Federal Rules of Evidence (Rule 702: Testimony by Expert Witnesses, revised 2011); Rule 702. Testimony by Expert Witnesses | Federal Rules of Evidence | LII / Legal Information Institute. https://www.law.cornell.edu/rules/fre/rule_702 [A15.1]

Federal Rules of Evidence (Rule 703: Bases of an Expert); Rule 703. Bases of an Expert | Federal Rules of Evidence | LII / Legal Information Institute https://www.law.cornell.edu/rules/fre/rule_703 [A15.1]

Federal Rules of Evidence (Rule 705: Disclosing the Facts or Data Underlying an Expert); Rule 705. Disclosing the Facts or Data Underlying an Expert | Federal Rules of Evidence | LII / Legal Information Institute. https://www.law.cornell.edu/rules/fre/rule_705 [A15.1]

Frye v. United States, 293 F. 1013 (D.C. Cir 1923); Frye v. United States - Green, Nesson & Murray: Evidence. <https://wiki.harvard.edu/confluence/display/GNME/Frye+v.+United+States> [A15.1]

General Electric Co. v. Joiner, 522 U.S. 136 (1997);

https://scholar.google.com/scholar_case?case=8141182863837122295 [A15.1]

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16. Ethics

A16.1	Describe how to handle human remains according to ethical standards/protocols
A16.2	Describe actions that demonstrate respect for decedent and family privacy and confidentiality
A16.3	Navigate simple ethical questions (appropriate use of photos, HIPAA, ABFA Code of Ethics)
A16.4	Demonstrate an understanding of the ABFA Code of Ethics and Conduct

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https://www.aafs.org/sites/default/files/media/documents/MASTER%20BYLAWS_3.6.24.pdf
[A16.4]

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[https://texreg.sos.state.tx.us/public/readtac\\$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=37&pt=15&ch=651&rl=219](https://texreg.sos.state.tx.us/public/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=37&pt=15&ch=651&rl=219) [Note: This document was written by the Texas Forensic Science Commission, but is applicable to all practitioners.]

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These references are important work preceding more recent methods. Examinees should be familiar with these but will not be asked specific questions about the articles or methods contained within.

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