A New Osteological Resource at the John A. Burns School of Medicine

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In 1993, the Medical School Hotline was founded by Satoru Izutsu PhD (former vice-dean UH JABSOM), it is a monthly column from the University of Hawai'i John A. Burns School of Medicine and is edited by Kathleen Kihmm Connolly PhD; HJH&SW Contributing Editor.

Abstract

The Mann-Labrash Osteological Collection of the University of Hawai'i is the newest collection of contemporary known-identity human skeletal remains in the United States. The collection, consisting of the partial or complete remains of individuals of European, African, Asian, and Pacific Islander ancestry, is an invaluable educational and research resource for medical students and visiting researchers. The collection reflects the population diversity of Hawai'i. The Mann-Labrash Osteological Collection provides a unique and irreplaceable resource for medical students and scientists interested in anatomy, disease, trauma, developmental defects, and biological diversity, particularly as they pertain to Hawai'i and the people of Polynesia.

Keywords

Osteological collection, human skeleton, anatomy, Mann-Labrash, Hawai'i

Introduction

The John A. Burns School of Medicine of the University of Hawai'i at Manoa (JABSOM) in 2019, has established a human osteological collection within the Department of Anatomy, Biochemistry & Physiology (ABP). The Mann-Labrash Human Osteological Collection consists of more than 200 contemporary known-identity individuals, primarily from Hawai'i. This educational and research collection is a vital part of the Willed Body Program initiated at JABSOM in 1974. Utilization of the osteological collection, in addition to all human anatomical materials, follows strict procedural and ethical standards as reported by Labrash and Lozanoff.[1]

This osteological collection, following in the tradition of many university, hospital, and medical school collections is named after the individuals who procured and developed the collection.[2-4] Robert Mann is a board-certified (Diplomate) forensic anthropologist and former physical anthropologist at the Smithsonian Institution and Director of the Department of Defense Forensic Science Academy. Steven Labrash is a Certified Funeral Service Practitioner and has served as the Director of the Willed Body Program at the University of Hawai'i since 2004. The combined efforts of Mann and Labrash, under the auspices of the former Departmental Chairperson, Dr. Scott Lozanoff, as well as the new Chairperson, Dr. Takashi Matsui, have led to the establishment of an osteology laboratory and the human osteological collection.

Body donation, either as a permanent or non-permanent donation at JABSOM, is through informed consent by the donor or donor family. The osteological collection, as well as all other anatomical teaching collections at the University of Hawai'i, are derived from the generous and altruistic donations of the Willed Body Program which has grown to about 175 donors yearly. Donors play a crucial role as "silent teachers" in helping medical and allied health science students master anatomy of the human body. The Mann-Labrash Osteological Collection, as part of the anatomy curriculum and resources, provides the foundation for a deeper knowledge and understanding of the human skeleton.

This osteological collection serves as a unique and invaluable resource for medical students and physicians, anatomists, forensic anthropologists, and allied medical and medicolegal practitioners. It reflects Hawai'i's unique cultural and ancestral diversity in the Pacific. It is unlike any other in the world since it imparts the combined impact of genetics, disease, environment, and cultural practices specific to the South Pacific region to present and future physicians as well as medical and allied medical practitioners and researchers. The osteological collection further provides medical students, surgeons, and other researchers with the opportunity for hands-on examination of human skeletal remains, an experience that cannot be replaced nor surpassed by textbooks or online resources.

Discussion

This osteological collection consists of the complete and partial remains primarily of Asian individuals who died between 1974 and 2019. The donors, aged 21 to 107 years, are comprised of diverse ancestries and ethnicities including African American, American Indian, Chinese, European, Filipino, Hispanic, Japanese, Korean, Polynesian and Pacific Islander, Vietnamese, and

mixed individuals reflecting Hawai'i's population diversity. However, the vast majority represent mixed ethnic Asians. Medical and patient histories reporting medical conditions, cause of death, and disease for the donors include primary and secondary bone cancer, trauma, amputation and sepsis, scoliosis, synovial chondromatosis, heart disease and atherosclerosis (calcified plaque and Mönckeberg's disease), cleft palate, Rett's Syndrome, symptomatic spina bifida, multiple sclerosis, gunshot, paraplegia, and fall from a height, among others. JABSOM's osteological laboratory also has several examples of plastinations and orthopedic surgical procedures including several examples of joint replacements. Over 2 dozen known-side and number (eg, left 2nd finger, right 4rd toe) hand and foot bones and 100 pairs of known-side ear ossicles are documented in this collection.

The Mann-Labrash osteological collection forms the core of an integrated and active educational and research program focusing on bone disease, trauma, remodeling and healing, non-metric traits and anatomical variants, degenerative joint disease and vascular calcifications as indicators of age at death, and metrical and morphological ancestry analysis of crania, to name a few. One of the primary goals of this irreplaceable skeletal collection is to serve as the foundation for osteological, anatomical, and medical research leading to a more complete understanding of bone disease, human anatomy, and variation. This osteological collection may additionally reveal the yet-unreported effects of aging on the human skeleton and body, the identification of skeletal indicators and anomalies that might assist in the diagnosis, prevention, geographical distribution, and treatment of certain diseases, and the many subtleties of variation in the human skeleton. In its short history, 4 text books[5-8] and one nearing completion, an online augmented reality anatomy book,[9] 2 published basic medical research studies,[10-11] several abstracts, poster presentations, 1 United States, 1 European, and 2 Thai doctoral dissertations (ongoing), and numerous 3D and online augmented reality models and images have utilized this osteological collection.

The osteological collection is also used by US Government forensic anthropologists from the Defense POW/MIA Accounting Agency (DPAA), as they prepare to take their board examination in an effort to qualify as a Diplomate of the American Board of Forensic Anthropology (currently there are only 91 diplomates globally). The collection has already served several researchers from Europe, Thailand, and the US Mainland. Several others plan to visit in the near future. The Department of Anatomy, Biochemistry and Physiology (ABP) also provides facilities to assist in the examination and identification of police forensic cases through the State of Hawai'i Medical Examiner.

The Department of ABP hosts the unique "Human Skeleton in Forensic Anthropology and Medicine Workshop" through the Outreach College, which is in its fourth year, and utilizes the collection as the primary means of instruction. This week-long workshop has attracted international students and professionals from Europe, Asia, South America, the US Mainland and Hawai'i, and was awarded "Western Association of Summer Session Administrators (WASSA) Best New Summer Course" in 2017: https://jabsom.hawaii.edu/collaborative-summer-forensics-course-wins-wassa-award-for-jabsom-uhwo-and-outreach-college/.

Following a JABSOM review process, the collection is available for non-destructive research and study by UH medical students and qualified investigators. Access and study of the collection currently is free-of-charge for non-commercial use by submitting a research statement via email to any of the authors.

Conclusion

The newly-established Mann-Labrash Osteological Collection provides an unparalleled opportunity for the study of human osteological materials that are unique to JABSOM and Hawai'i. This collection increases our knowledge of human anatomy, disease, trauma, and diversity, and contributes to the core effort of the University of Hawai'i to become a "Hawaiian place of learning" and is dedicated to fulfilling JABSOM's mission of educating current and future healthcare professionals and leaders.

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