

AAACA Regional Meeting
Saturday, October 7, 2017
Mesa, AZ



A.T. Still University

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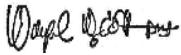
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Welcome to the AACA Regional Conference

We are so pleased to welcome each of you to Mesa, ATSU and the second American Association of Clinical Anatomists (AACA) Regional Conference. We are excited to be able to continue the nascent tradition of bringing the AACA to a more intimate, local setting. Three schools of ATSU have worked to put together a great experience while you are here: The Arizona School of Dentistry & Oral Health (ASDOH), the Arizona School of Health Sciences (ASHS) and the School of Osteopathic Medicine in Arizona (SOMA). We think you will enjoy our keynote speakers, the posters, activities and the platform presentations. We are particularly proud to pioneer the concept of the Virtual Poster Presentation, where remote presenters are able to participate in our poster session. Here's hoping all the technology works!

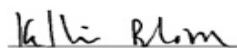
To flourish as a profession and a discipline, we need to constantly inquire, question, experiment and share. These conferences are the ideal marketplace to distribute, consider, debate and challenge our methods, knowledge and ideas. As anatomists we, at once, have the unique privilege to be the guardians of one of the most ancient of scientific disciplines and the responsibility to continue the dynamic excitement of discovery. We do that together. We help keep each other current and innovative while honoring our venerable history. Thank you for attending and contributing to this Regional Conference. We hope you truly enjoy yourself.



Wayne W. Cottam, DMD, MS



Jonathan J. Wisco, PhD



Kellie C. Huxel Bliven, PhD, ATC



Jay M. Crutchfield, MD, FACS



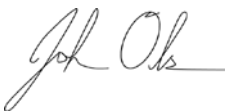
William F. Robinson, DPT, PHD



Chelsea M. Lohman Bonfiglio, PhD, ATC, CSCS



Saskia D. Richter, PhD, ATC



John Olson, PhD



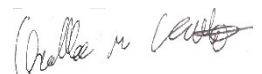
Anna Campbell, PhD



Dale F. DeWan, DMD, MS



Starr C. Matsushita, OMSIV



Chandler M. Cottam



Raghu N. Kanumalla, MS, OMS-IV



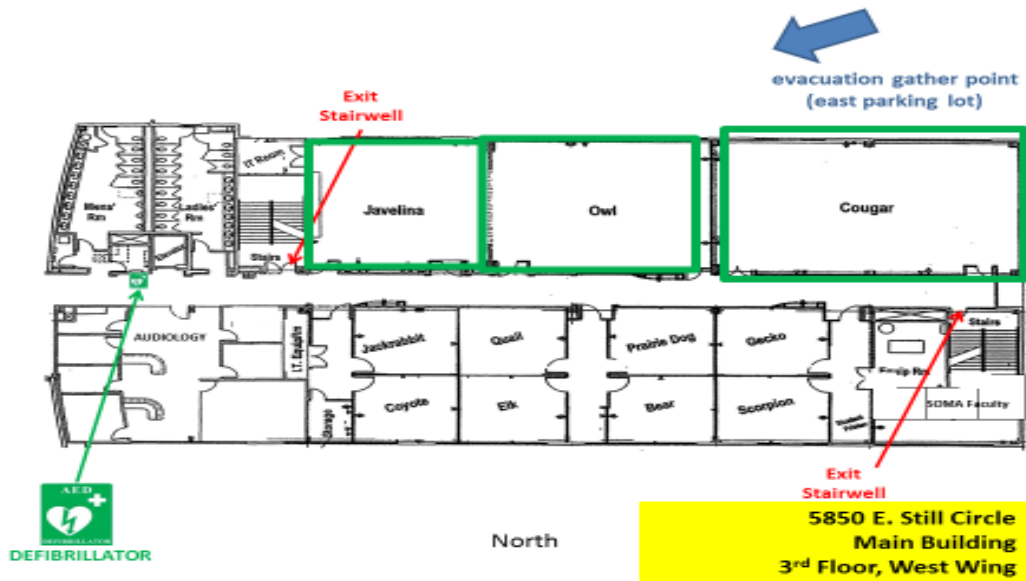
Adam J.S. Raffoul, MSc.

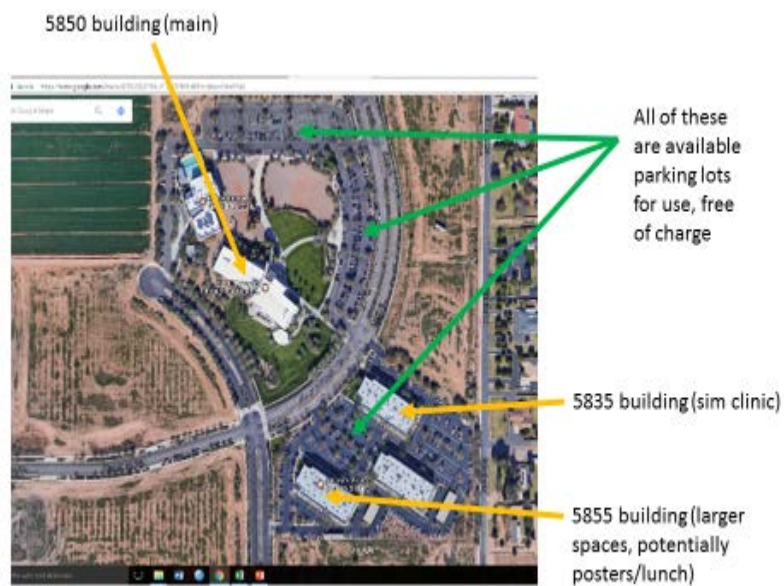
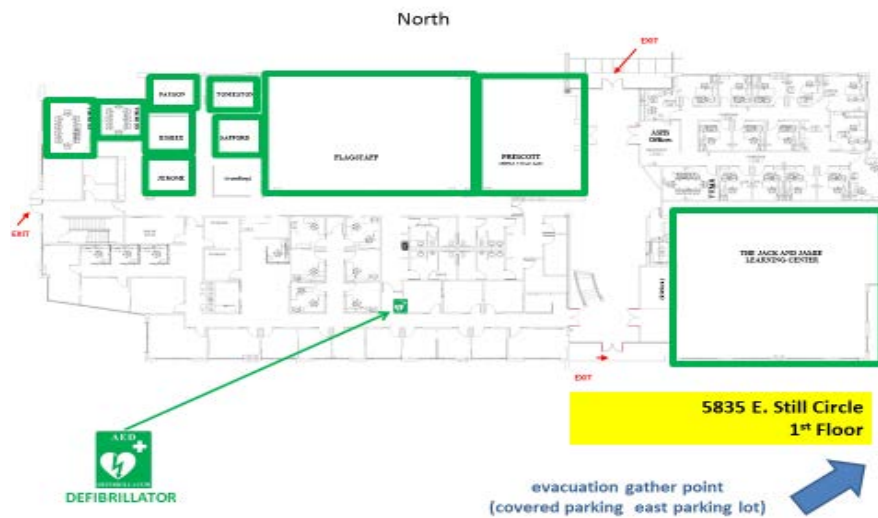
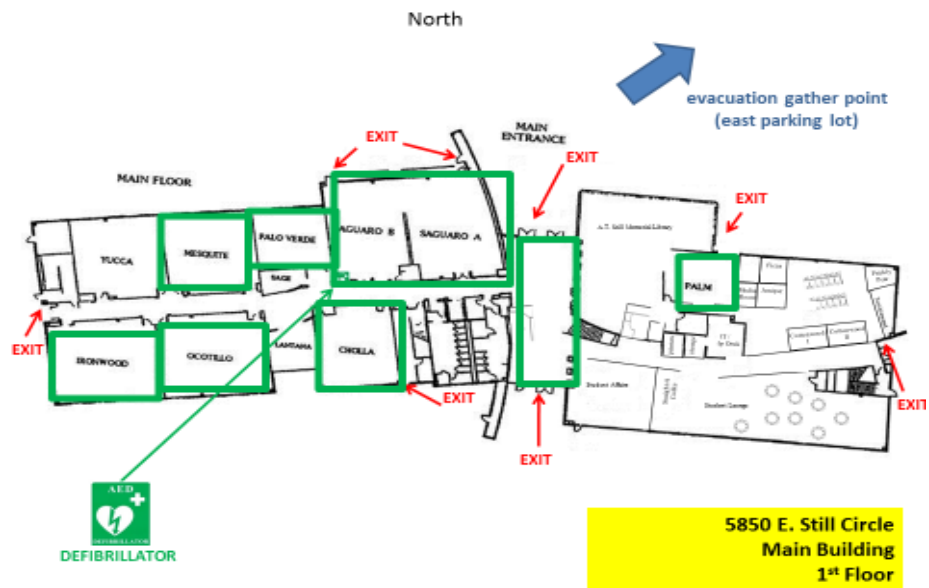
AACA Regional Conference

Schedule for Saturday, October 7

Time	Session	Speaker or Leader	Location
8:00 AM – 8:45 AM	Opening Speaker – Dr. David Morton: <i>“Becoming Janus: Ideas for implementing pedagogical innovations”</i>	Dr. David Morton	Saguaro A & B
9:00 AM – 12:00 PM	Demonstration Activities <ul style="list-style-type: none"> • Ultrasound Demonstration • Osteopathic Manual Manipulation (OMM) Demonstration • Virtual and Wet Anatomy Lab Tours 	Leader: <ul style="list-style-type: none"> • Kellie Bliven and Inder Makin • Raghu N. Kanumalla and Starr C Matsushita • William Robinson And Jay Crutchfield 	Room: <ul style="list-style-type: none"> • Cholla • Owl & Javelina • Virtual – 1st Floor, Wet – 2nd Floor
12:00 PM – 12:20 PM	Lunch and Group Photograph		The Jack and Jaime Learning Center
12:20 PM – 12:50 PM	Lunch and Presentation Group A – Virtual and E- Posters		The Jack and Jaime Learning Center – Virtual Posters Flagstaff – E-Posters
12:50 PM – 1:20 PM	Lunch and Presentation Group B – E-Posters		Flagstaff
1:20 PM – 1:30 PM	Transition to Afternoon Sessions		

<p>1:30 PM – 4:20 PM</p> <p>Repeated every 50 minutes:</p> <p>1:30 PM – 2:20 PM 2:30 PM – 3:20 PM 3:30 PM – 4:20 PM</p>	<p>Demonstration Activities</p> <ul style="list-style-type: none"> • CAD/CAM and Digital Dentistry Demonstration • 3D Printing Demonstration 	<p>Leader:</p> <ul style="list-style-type: none"> • Matthew B. Kahn • Saskia Richter 	<p>Room:</p> <ul style="list-style-type: none"> • Palo Verde • Cholla
<p>1:30 – 4:20 PM</p>	<p>Concurrent Presentation Sessions</p> <ul style="list-style-type: none"> • 1:30 – 1:55: Dr. Ahmed Al-Imam • 1:55 – 2:20: Dr. Inder Makin • 2:30 – 2:55: Break with Vendors • 2:55 – 3:20: Dr. Randall Nydam • 3:30 – 3:55: Dr. Jonathan J. Wisco 		<p>Room: Saguaro A</p>
<p>4:30 PM – 5:15 PM</p>	<p>Closing speaker – Dr. Mindy Motahari: <i>“Interprofessional Education at the schools of A.T. Still University”</i></p>	<p>Dr. Mindy Motahari</p>	<p>Saguaro A & B</p>





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Speakers

Saturday, October 7

8:00 – 8:45 AM
Saguaro A & B

“Becoming Janus: Ideas for implementing pedagogical innovations”

Dr. David A. Morton, Ph.D.
Professor and Vice Chair of Medical and
Dental Education
University of Utah School of Medicine



Literature demonstrates that students learn more, in terms of memorizing and problem solving, when they are actively involved in the educational process. Additionally, providing students with retrieval-based exercises further promotes understanding and retention. As such, professors need to find ways to transition from dispensing information to building classrooms where students actively engage in the material, collaborate with each other and participate in activities that require them to retrieve learned information. This seminar provides the evidence for and the guiding principles of active learning and retrieval. Participants will leave with a number of low-tech teaching innovations for incorporating active learning and retrieval exercises in their classrooms and labs.

Dr. Morton is a Professor and Vice-Chair of Medical and Dental Education in the Department of Neurobiology and Anatomy at the University of Utah School of Medicine (UofU SOM). He serves as curriculum director and teaches gross anatomy, histology and neuroanatomy to medical, dental, physician assistant, physical therapy and occupational students. His research interests include the creation and incorporation of active learning activities, the flipped classroom and use of cadavers in medical education.

Dr. Morton recently served on the Board of Directors for the American Association of Anatomists (AAA) and is also an active member of the American Association of Clinical Anatomists (AACCA), International Association of Medical School Educators and Association of Anatomy (IAMSE), Cell Biology and Neurobiology Chairpersons (AACBNC). He serves as a Fellow on the Academy of Medical Science Educators at the U of USOM and is the recipient of the Distinguished teacher award and Jarcho Distinguished teaching award.

Dr. Morton has authored a number of textbooks including Gray's Dissection Guide for Human Anatomy (Elsevier), The Big Picture. Gross Anatomy textbook, The Big Picture. Histology (McGraw Hill) and A Photographic Atlas for the Anatomy & Physiology Laboratory (Morton Publishing). He also serves as a visiting professor to Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi, Ghana.

4:15 – 5:00 PM
Saguaro A & B

“Interprofessional Education at the schools of A.T. Still University”


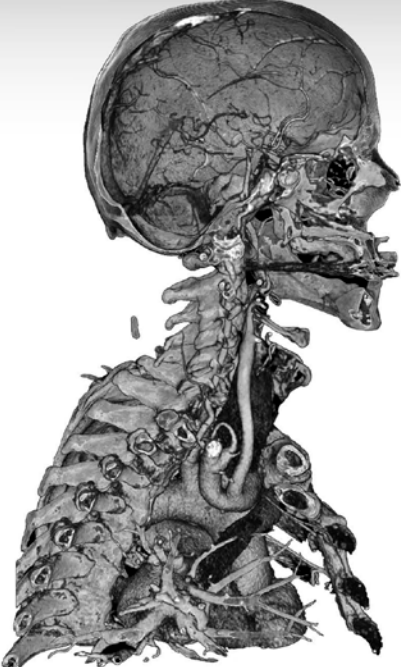
Dr. Mindy Motahari, DMD, MAED
Care Unite and Interprofessional Education
Director
Arizona School of Dentistry & Oral Health



A.T. Still University is uniquely positioned to provide interprofessional education (IPE) for the dental (DMD), medical (DO), and physician assistant (PA) students in both didactic and clinical environments. Students are exposed to the basics of IPE and how to communicate with their peers in a didactic setting. Clinically, both the A.T. Still dental clinic and community partner clinics are utilized to bring the students together to focus on direct patient care. The presentation will describe our current didactic and clinical activities with an emphasis on how anatomy is taught through the lens of IPE. Examples include: 1) Teaching DO and PA students about oral structures so that they can identify oral pathology and

administer dental local anesthesia; and 2) Teaching dental students about listening to heart and lung sounds to better access overall patient health.

Dr. Mindy Motahari (DMD, MAED) is currently a clinical Care Unite and Interprofessional Education Director at the Arizona School of Dentistry & Oral Health. She received her DMD from the same institution while she received her certificate of Core Public Health concepts from the University of North Carolina. She received her Certificate of Dental Education along with her MAED from University of Pacific, CA. She also received her Business/ Legal Certificate form Arizona Summit Law School. Meanwhile she follows her passion for patient care in the private practice setting.



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AACA Regional Meeting Demonstration Activities

Morning Demonstration Activities

9:00 – 12:00 PM

1. Ultrasound Demonstration - Cholla

One of the keys to a strong clinical examination and ultrasound imaging skills is a comprehensive knowledge of human anatomy. This presentation will introduce foundational concepts, demonstrate ultrasound imaging, and discuss the value of real-time ultrasound imaging as a teaching tool to enhance learning of anatomy and clinical hands-on skills.

Kellie C. Huxel Bliven, PhD, ATC
Professor, Clinical Anatomy
Director, Interdisciplinary Research Lab
Department of Interdisciplinary Health Sciences
Arizona School of Health Sciences
A.T. Still University

Inder Makin, MD, PhD
Associate Professor
School of Osteopathic Medicine in Arizona
Arizona School of Dentistry & Oral Health
A.T. Still University

2. Osteopathic Manual Manipulation (OMM) Demonstration Owl & Javelina

Visit the lab to learn about how osteopathic medical students and physicians are applying anatomy to treating patients with osteopathic manipulative medicine. Lead by SOMA's current Osteopathic and Anatomy fellows.

Raghu N. Kanumalla, M.S., OMS-IV
Doctor of Osteopathic Medicine,
Master of Public Health dual-degree candidate
Pre-Doctoral Teaching and Research Fellow
A.T. Still University | School of Osteopathic Medicine in Arizona

Starr C Matsushita, OMSIV
Doctor of Osteopathy candidate
Pre-Doctoral Teaching and Research Fellow
A.T. Still University | School of Osteopathic Medicine in Arizona

3. Virtual and Wet Anatomy Lab Tours– Virtual – 1st Floor, Wet – 2nd Floor

Tour the Anatomy facilities on the ATSU, Mesa Campus: this is your opportunity to see the Virtual Anatomy Lab, with 3D projection of anatomic images; also tour the cadaver lab to see down-draft dissection tables, iPela cameras, and touch-screen monitors.

William F. Robinson, DPT, Ph.D.
Associate Professor of Anatomy
A.T. Still University - School of Osteopathic Medicine in Arizona

Jay M. Crutchfield, MD, FACS
Associate Professor
Chairman, Dept. of Anatomy
School of Osteopathic Medicine (Arizona)

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Afternoon Demonstration Activities

1:30 – 4:20 PM

1. CAD/CAM and Digital Dentistry Demonstration– Palo Verde

Virtual treatment planning utilizing 3D reconstructions of real-time human anatomy is no longer science fiction. It is being used throughout medicine and dentistry to visualize internal and external anatomy, plan procedures, and design and fabricate custom fit prosthetics from a variety of materials. At the Arizona School of Dentistry and Oral Health, we use a combination of optical surface scanning technology and 3D computed topography to plan various surgical and restorative procedures as well as fabricate customized surgical guides and permanently fixated prosthetic restorations. This demonstration will describe some of the didactic and clinical parameters of our virtual treatment planning modules and provide some hands-on examples of the customized prosthetics that are currently being used at ASDOH.

Matthew B. Kahn, DDS, MS, FACP
A.T. Still University of the Health Sciences
Arizona School of Dentistry and Oral Health

2. 3D Printing Demonstration– Cholla

Will focus on innovative ways to implement technology into curriculum. The session will include a demonstration followed by a hands-on group activity to develop curricular components to facilitate problem-based, multimodal approaches using a 3D printer.

Saskia D. Richter, PhD, ATC
Dept. of Interdisciplinary Health Sciences
A.T. Still University

Posters – Virtual Poster

12:20 – 12:50 PM

Interprofessional Education : The Jack and Jaime Learning Center

CHANG, Grace C, Samantha B HO, William ROBINSON. Institutional Affiliation: A.T. Still University-School of Osteopathic Medicine (ATSU-SOMA) in Arizona, Mesa, AZ, USA, 85206

Effects of IPE on early exposure to clinical experience within ATSU-SOMA's unique curriculum.

INTRODUCTION. As healthcare becomes more patient-centered, a greater emphasis is placed on effective collaboration between health professionals to ensure quality care. As a result, Interprofessional Education (IPE) has become an increasingly crucial component of medical education. The unique curriculum at A.T. Still University - School of Osteopathic Medicine in Arizona (ATSU-SOMA) allows students in their preclinical years (first and second) to learn and practice in an interprofessional environment. Although there had been an increase in IPE recently, IPE opportunities are still sparse. The goal of this study is to evaluate the potential benefit of preclinical IPE on the long-term performance and attitudes of students at ATSU-SOMA. METHODS. Beginning in July 2016, self-created questionnaires including two validated surveys, Readiness for Interprofessional Learning Scale (RIPLS) for first years and the Interdisciplinary Education Perception Scale (IEPS) for the second through fourth years, were distributed to current students. Variables surveyed include age, community health center location, previous work experience and perception of IPE. SUMMARY. A total of 165 students (38.6%) completed the surveys. Over 78% of first year respondents with a history of interprofessional experience considered IPE to be very important and relevant for future collaboration, as compared to 60% of those without previous interprofessional experience. Second year students demonstrated a stronger understanding of the roles of other health professionals after IPE events, compared to third and fourth years. CONCLUSIONS. Early exposure to IPE prior to medical school and increased inclusion of IPE in medical school curriculum may positively influence the students' understanding and attitudes toward working in multidisciplinary healthcare teams in the clinical setting. (Sponsored by Grant No. STU 16-02 from the A.T. Still University Student Research Grant)

Posters – E-Posters

12:20 – 12:50 PM

Interprofessional Education : Flagstaff

LOITZ, Jake¹, Shae CROSBY¹, Sarah FUDGE¹, Cassie HOOPER¹, Katy HURST¹, Maren MUNIZ¹, Sloan POELMAN¹, Emily SHELLMAN¹, Jonathan J. WISCO^{1,2}. ¹Department of Physiology and Developmental Biology, Neuroscience Center, Brigham Young University, Provo, UT 84604, USA; ²Department of Neurobiology and Anatomy, University of Utah School of Medicine, Salt Lake City, UT 84132.

Anatomical and Physiological sciences combined with art provides a unique educational experience.

INTRODUCTION. Anatomy and physiology textbooks/online resources are replete with vocabulary terms and figures that provide students with a basic understanding of human biological structure, but in many cases insufficiently illustrate the complexity of relevant or associated physiological processes. This requires a deep understanding of the human body, not to mention artistic talent, to convey. This last Spring semester, we combined the talents of undergraduate anatomy and illustration students to portray complex anatomy and physiology concepts and processes in art form. RESOURCES. In order to maximize the learning experience, anatomy and art students worked in pairs. Students received didactic instruction on a seven different organ systems over the course of a 7-week course (meeting twice weekly, each for 3 hours of contact time). DESCRIPTION. After in-depth instruction about anatomy and physiology of a particular organ system, anatomy-art student pairs worked together to plan illustrations of at least one physiological functions that could be depicted with the relevant anatomy. Due to the seven-week term, students had roughly a week to plan and do each project. The illustrations from teams over the course of the semester varied in medium to include vector drawing, animation, pen and ink, or pencil. We will present the artworks that were produced as a result of the class. SIGNIFICANCE. The teamwork of an anatomist with an artist allowed for better collaboration toward depicting complex anatomy and physiology concepts. This class serves as a model help future students who excel in both anatomy and/or art to pursue further scientific studies and/or a medical illustration degree and career.

RICHTER, Saskia D.¹, Diana L. MESSER², Doug DANFORTH³, and Laura C. BOUCHER², ¹Department of Interdisciplinary Health Sciences, ASHS, A.T. Still University, Mesa, AZ, 85206, USA; ²Division of Anatomy, CoM, The Ohio State University, Columbus, OH, 43210, USA; ³Department of Obstetrics and Gynecology, CoM, The Ohio State University, Columbus, OH, 43210, USA; ⁴School of Health and Rehabilitation Sciences, CoM, The Ohio State University, Columbus, OH, 43210, USA.

Medical Student Perception on Optional Supplemental Instruction In Anatomy Lab

INTRODUCTION. Medical students who receive supplemental instruction have increased test scores and decreased failure rates. While instructor-led laboratory reviews are most beneficial, recent findings demonstrate the benefit of supplemental instruction by graduate teaching associates (near-peers). This study investigates first-year medical student's perception of near-peer supplemental instruction (NPSI) in gross anatomy. **METHODS.** First-year medical students from The Ohio State University College of Medicine class of 2020 (n=204) were offered NPSI during the Bone and Muscle Disorders Block. Twelve NPSI sessions (total of 23 hours) were offered. Immediately following the anatomy practical exam, students were provided an optional 10 question Likert-scale survey. Questions focused on confidence, knowledge, and usefulness of NPSI. ANOVA was used to compare confidence between students and change in confidence for NPSI users. **SUMMARY.** Majority (n = 182) of students completed the survey. Most students (74%) attended at least one NPSI session. On a scale of 1 (strongly disagree) to 5 (strongly agree), students who were asked to rate their confidence in anatomy after lecture, lab, and NPSI. No difference was found between groups (NPSI users vs. non-users) confidence after lecture (p = 0.68) and lab (p = 0.87). Students who attended NPSI reported feeling more confident (4.07) with the material then after attending lecture and lab alone (p < 0.01, t = -7.40, df = 149). Students reported gaining knowledge (4.34) from NPSI, it was an adequate use of study time (4.30), and had a positive impact on test scores (4.25). **CONCLUSIONS.** Students who attended NPSI demonstrated significantly increased confidence in their anatomy knowledge. NPSI provides students with a study environment in which they feel their time is efficiently spent. This study demonstrates NPSI may be an effective teaching tool for first-year medical students taking anatomy.

SABIDO Lorenzo*, Franz PUYOL*, and Dolgor BAATAR**. *MD candidate, Paul L Foster School of Medicine, Texas Tech University Health Sciences Center El Paso, El Paso, TX 79905, USA. **Department of Medical Education, Paul L Foster School of Medicine, Texas Tech University Health Sciences Center El Paso, El Paso, TX 79905

Spaced education learning modules improve medical student performance on anatomy examinations.

INTRODUCTION. Portable ultrasound (U-S) imaging systems with application specific point of care ultrasound (POCUS) protocols are being increasingly used in medical education. However, despite several potential advantages of U-S in improving quality of medical education, a major barrier for its widespread introduction is the lack of U-S scanning experience within the teaching community. **RESOURCES.** Two osteopathic medical schools within greater Phoenix (AZ College of Osteopathic Medicine, Glendale, and School of Osteopathic Medicine in Arizona) have collaborated to develop a series of lectures with hands-on practice sessions for introducing U-S based teaching-relevant topics to their respective faculty. The training topics covered the basics of U-S instrumentation, teaching methodology, as well as anatomy, physiology, medical skills and instruction of osteopathic principles (OPP). Faculty from both institutions alternated in leading each seminar. The lecture was available in-person, was transmitted through live interactive link to the other institution using Zoom™ software, as well as was recorded for future review by participants. U-S instrumentation was available at each location, for hands-on practice during each seminar. **DESCRIPTION.** To develop and deliver a series of U-S imaging-based training sessions for basic science and clinical faculty in order to successfully incorporate U-S in medical student training. **SIGNIFICANCE.** Integration of U-S in medical education enables students an interactive hands-on possibility for learning anatomy, physiology, OPP, and medical skills. U-S experience during medical training enables future clinicians to be better trained in using this modality in practice of POCUS in several clinical specialties. Adequately training teaching faculty and providing them confidence in the use of instrumentation and standardized scanning protocols potentially helps overcome one of the major roadblocks to U-S dissemination in medical education.

SCRIBNER, Maggie and GEST, Thomas. Paul Foster School of Medicine, Texas Tech Health Sciences Center, El Paso, TX, 79905.

Anatomical variations in renal veins and arteries .

INTRODUCTION: It has been established that variations in renal arteries and veins are not uncommon though documentation of these variations remains sparse. What are understood to be typical variations occur commonly in vasculature and those found in the kidneys may specifically arise from interactions with the suprarenal gland which receives some arterial supply and drainage from the renal arteries and veins, and gonadal vasculature as both these structures are in close approximation with the kidneys during some stages of embryological development. **RESOURCES:** 49 preserved cadavers including 98 kidneys were utilized in this study. The specimens were provided by the anatomy labs at Texas Tech University Health Sciences Centers in El Paso and Lubbock. **DESCRIPTION:** For each specimen, the hilum, ureter, renal artery, renal vein, gonadal artery, and gonadal vein were identified. The vasculature was then traced to their connections at the inferior vena cava and aorta. Abnormal findings, including accessory renal arteries and veins, segmental branches, and unusual vascular paths, were documented with photography. Of the 49, 17 cadavers or 34.7% were noted as having atypical vasculature. **SIGNIFICANCE:** This study identified numerous variations in individuals whose causes of death did not indicate renal dysfunction or insufficiency. Thus, it may be understood that variations in renal arteries and veins are relatively underreported. However, an understanding of these variations in normal anatomy has implications in imaging studies and procedures including surgery.

Dental and Head and Neck Anatomy: Flagstaff

12:50 – 1:20 PM

CHAVARRIA, Matthew A, Neil S NORTON. Creighton University School of Dentistry, Omaha, NE, USA 68178 .

Demonstration of the clinical anatomy of a dental induced Bell's palsy using fresh tissue cadavers.

INTRODUCTION. Pain control is paramount in the field of dentistry. Dentists have confidently relied on intraoral injections to control pain. The inferior alveolar nerve (IAN) block is one of the most commonly used injections in mandibular anesthesia. While the IAN block has a high success rate, complications can arise. One potential complication is an iatrogenic induced Bell's Palsy. In this case, the anesthetic diffuses throughout the parotid gland and anesthetizes parts of the facial nerve producing paralysis. The purpose of this study is to demonstrate the clinical anatomy involved in a dental induced Bell's Palsy. RESOURCES. Fresh tissue cadaver heads were procured. Methylene blue was diluted and aspirated into a standard carpule. Cadaver heads were divided into 3 groups; no injections, those receiving a standard IAN injection, and a Bell's Palsy group in which the needle was advanced past the pterygomandibular space (PMS) of a standard IAN injection and into the parotid bed. DESCRIPTION. In non-injection cadavers, dissection was performed to illustrate the PMS and contents or the branching of the facial nerve within the parotid bed. In IAN injected cadaver heads, dissection was performed to illustrate the extravasation of the dye in the PMS and what structures would be affected. In the Bell's Palsy cadaver heads, dissection was performed to illustrate the extravasation of the dye in the parotid bed and what structures would be affected. SIGNIFICANCE The success of the IAN relies heavily on the dentist's understanding of clinical anatomy and the application of this knowledge to properly utilize intraoral and extraoral landmarks. Poor understanding of the clinical anatomy or improper application of this knowledge can greatly increase the chance of failure of the injection as well as the chance of undesired complications such as Bell's palsy.

ESCOBEDO, Yissela A. Heather BALSIGER Thomas GEST. Texas Tech Health Sciences Center, El Paso.

Understanding the Puzzling Innervation of the Lacrimal Gland

INTRODUCTION. Clinical syndromes such as dry eye disease (DED) have been known to be complications of lacrimal gland (LG) dysfunction. Previous studies suggest that the alteration in the functions of nerves innervating the LG and the ocular surface might be suggestive of the pathogenesis of DED. **METHODS.** Seventeen cadaveric heads in a bisected state were utilized, with the calvaria and brain removed from the cadaver to then dissect the specimens at the supra lateral region. Specimens were taken from the zygomaticotemporal nerve (ZTN) before the bone and after the bone at the entrance of the LG. One sample was taken between the zygomatic bone and the LG. A final sample was taken from the lacrimal nerve the entrance of the LG. Specimens were processed into paraffin cassettes and then set into slides with immunohistochemically stains for NF, VR1 and CHAT antibodies. **SUMMARY.** Our analysis was positive for the antibody NF at the ZTN and LN locations, confirming the nerve origin of the samples. All samples analyzed for CHAT were positive for this antibody indicating LN and ZTN contained motor parasympathetic fibers. Our samples were also positive for VR1, indicating that both ZTN and LN sections contained sensory fibers. **CONCLUSIONS.** Previous publications state ZTN carries sensory fibers for the skin superolateral to the orbit and parasympathetic motor innervation to the LG. ZTN sends a communicating branch to the LN, and LN then passes through the gland to end in the skin of the upper eyelid. Our results show presence of sensory and motor fibers within the communicating branch of the ZTN and motor fibers at different locations along the LN. Furthermore, these findings suggest possible overlap in sensory function between the ZTN and LN and may indicate sympathetic motor fibers within the LN.

FINCH, Charles, DO1, Randall L. NYDAM, Inder Raj S. MAKIN, MD, PhD2, Jim RINEHART1, Akash PATEL, MS21, Aaron PIKE, MS21, Priya SHARMA, MS21, Stephane CHARTIER, MS21, Robert BARNES, MD3. 1Arizona College of Osteopathic Medicine, Midwestern University, 19555 N 59th Ave., Glendale, AZ 85308; 2School of Osteopathic Medicine in Arizona, A.T. Still University, 5850 E. Still Circle, Mesa, AZ 85206; 3 Scottsdale Emergency Associates 7400 E. Osborn Rd., Scottsdale, Arizona 85251.

Collaborative development of a four-year, integrated, longitudinal ultrasound curriculum at AZCOM

INTRODUCTION. In recognition of the rapidly growing utilization of point of care ultrasound (POCUS) as a primary diagnostic tool for practitioners at all levels (interns, residents, fellows, etc.), AZCOM is developing and implementing an integrated, longitudinal ultrasound (US) experience throughout its curriculum. When fully implemented, the objectives will include the ability to: 1) demonstrate operational familiarity of US machines; 2) demonstrate proper orientation to US images of normal anatomy; 3) properly interpret normal US-based functional data (e.g., B-mode, Color Doppler, Pulsed Wave Doppler, M-mode, etc.); 4) recognize and describe abnormal findings; 5) utilize POCUS in patient-based clinical experiences. **RESOURCES.** Currently, AZCOM has access to seven US devices for educational use with plans to increase this number by early 2018. Additionally, AZCOM has partnered with AT Still University, SOMA to develop and implement an ongoing interdisciplinary faculty development series to provide instructors with general US understanding, utilization, and practice. The AZCOM student body has also formed an Ultrasound Student Interest Group to promote POCUS and assist faculty in development, testing, and implementation of US workshops in the MS1 anatomy course. **DESCRIPTION.** Pre-clinical and clinical faculty are collaborating to develop clinically-based, course-specific US workshops utilizing US examination techniques and image interpretation for their courses. Additionally, courses will also include US- based, board-style exam questions. **SIGNIFICANCE.** In the 2016–17 academic year AZCOM had a 3-hour US experience in a single 3rd year course. For 2017–18 there will be 10 courses across the curriculum with integrated US experiences/imagery. By the 2018-19 year US this will rise to 13 courses and postgraduate training will be added the following year. Each year the US experiences will be assessed and modified in what is planned to be a dynamic aspect of the curriculum.

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[Anatomy Academy: learning while serving or serving while learning? A narrative experience.](#)

INTRODUCTION. Since 2012, Anatomy Academy has not only served thousands of elementary students to teach healthy habits, but has also helped thousands of pre-professional and professional/graduate student volunteers to grow, learn, and change in their teaching and learning paradigm. **RESOURCES.** Volunteers for Anatomy Academy guide elementary students through a 7-week program teaching basic anatomy, physiology, and nutrition. Lessons include demonstrations with models,

multimedia, art, and even dissections of animal organs. Volunteers are encouraged to think outside the box and create activities tailored to the needs of their students that supplement the primary curriculum. To encourage introspection, volunteers respond to specially crafted surveys and reflection questions after a lesson each week.

DESCRIPTION. Anatomy Academy has played a profound role in my undergraduate and graduate education. The transformative power of Anatomy Academy is evident when volunteers and students become enveloped and enraptured by the dynamic learning process. The most successful volunteers, measured by answers to their reflection questions, have one thing in common: through teaching, a volunteer has formed a significant learning relationship with a particular person or demographic based on specific complementary and mutually beneficial skills and life experience. Indeed, we have observed our own personal growth as a result of having participated in Anatomy Academy over these last five years.

SIGNIFICANCE. Participating in Anatomy Academy can have a life-long personal or vocational impact. Alumni of the program often express how their perspective on life-long learning, or their career path, have changed as they realized the difference they can make in the lives of their students. We recommend to other institutions, based on our experience, that providing service-learning opportunities for students helps them learn intangible skills of life-long and self-directed learning.

Breakout Sessions: Saguaro A

1:30 – 4:20 PM (in order of presentation)

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The Articular Surfaces of the Proximal Segment Ulna: Morphometry and Inferential Statistics

INTRODUCTION: The elbow joint is a compound joint made of articulations in between the humerus, ulna, and the radius. Articular areas are of prime importance from the kinetic-biomechanical perspective, and of ethnic significance. These articulations can be affected by several pathologies that may require medical interference, including surgical. This experimental analysis aims to infer data in relation to the morphometry of the proximal segment of the ulna and its articular surfaces represented by the greater and lesser sigmoid notches. **METHODS:** A sample of fifty ulnae (n=50, 27 right and 23 left) was studied in connection with; the surface area of the sigmoid notches (SA), weight of ulna, and the volume of proximal portion of ulna including the olecranon process, in addition to the longitudinal dimensional parameters including the straight distance between the tip of the olecranon and coronoid process (OCD), the mid-olecranon thickness in mediolateral (T1) and anteroposterior orientation (T2), and the length of ulna (L). **SUMMARY:** It has been inferred that there were no significant differences in between right versus left ulnae and in relation to the majority of morphometric parameters with an exception for OCD (22.47 vs 20.75, p-value=0.002). Further, the area of the trochlear notch was significantly larger than that of the radial notch (p-value<0.001). There was also a positive correlation in between all the observed parameters, although the strongest correlations were found to be in between; OCD, trochlear notch area, and the weight of ulna. **CONCLUSIONS:** A precise conclusion was reached in relation to morphometry, the pertinent biomechanics of the proximal segment of the ulna; key findings are of value to engineers, medical professional including surgeons and rheumatologists, researchers, evolutionary biologist, and physical anthropologist. Data from this study can be exploited to (reverse) engineer the perfect implant.

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Inter-institutional collaboration for faculty training, integrating ultrasound in medical education

INTRODUCTION. Portable ultrasound (U-S) imaging systems with application specific point of care ultrasound (POCUS) protocols are being increasingly used in medical education. However, despite several potential advantages of U-S in improving quality of medical education, a major barrier for its widespread introduction is the lack of U-S scanning experience within the teaching community. **RESOURCES.** Two osteopathic medical schools within greater Phoenix (AZ College of Osteopathic Medicine, Glendale, and School of Osteopathic Medicine in Arizona) have collaborated to develop a series of lectures with hands-on practice sessions for introducing U-S based teaching-relevant topics to their respective faculty. The training topics covered the basics of U-S instrumentation, teaching methodology, as well as anatomy, physiology, medical skills and instruction of osteopathic principles (OPP). Faculty from both institutions alternated in leading each seminar. The lecture was available in-person, was transmitted through live interactive link to the other institution using Zoom™ software, as well as was recorded for future review by participants. U-S instrumentation was available at each location, for hands-on practice during each seminar. **DESCRIPTION.** To develop and deliver a series of U-S imaging-based training sessions for basic science and clinical faculty in order to successfully incorporate U-S in medical student training. **SIGNIFICANCE.** Integration of U-S in medical education enables students an interactive hands-on possibility for learning anatomy, physiology, OPP, and medical skills. U-S experience during medical training enables future clinicians to be better trained in using this modality in practice of POCUS in several clinical specialties. Adequately training teaching faculty and providing them confidence in the use of instrumentation and standardized scanning protocols potentially helps overcome one of the major roadblocks to U-S dissemination in medical education.

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Development and Implementation of Hands-On Ultrasound Workshops in an MS1 Clinical Anatomy Course

INTRODUCTION. As part of the development of a longitudinal, integrated, ultrasound experience in the AZCOM curriculum, the first year clinical anatomy course has initiated a series of clinically-based ultrasound (US) workshops. These workshops are designed to: 1) begin training of students on the use of US machines; 2) train students to interpret normal anatomy in US images; 3) reinforce anatomical concepts. **RESOURCES.** Midwestern University currently possesses seven US devices for educational use with plans add more by early 2018. The AZCOM student body has also formed an US Student Interest Group to promote POCUS and the founding members have been instrumental in the development, rehearsal, and implementation of the US workshops in the MS1 anatomy course. **DESCRIPTION.** Eight workshops are planned for the six-month, two quarter anatomy course. These workshops, designed as a collaborative effort between pre-clinical and clinical faculty, are specific to each of the eight regionally-based instructional units: Back and Scapular Regions—US assisted Lumbar Puncture; Upper Extremity—Carpal Tunnel Assessment; Thorax—Cardiac Assessment; Abdominal—FAST exam; Posterior Abdominal wall/Pelvis/Perineum—Kidney Assessment, Lower Extremity—Tarsal Tunnel/DVT; Head and Neck I—Carotid Sheath Assessment; Head and Neck II—Thyroid Assessment. US-based questions will be included in the written and practical portions of the unit exams to assess student progress. **SIGNIFICANCE.** Clinical correlations are common in anatomy courses, but are generally conceptual. The addition of the US workshops to the AZCOM anatomy course adds a “hands-on” experience that combines developing familiarity with US use along with fundamental anatomical knowledge as tools for developing diagnostic and clinically important skills. The student population will be surveyed at the end of the course in order to assess, evaluate, and continue development of the US workshop experience in the first year anatomy course.

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The uncertainty principle of self-directed learning and a TA training program in response

INTRODUCTION. The Liaison Committee on Medical Education (LCME) has mandated that medical schools provide opportunities for self-directed learning in order to qualify for accreditation. Set forth in Section 6.3, “Self-directed learning involves medical students’ self-assessment of learning needs; independent identification, analysis, and synthesis of relevant information; and appraisal of the credibility of information sources.” Despite this definition, educators grapple with establishing activities that provide self-directed learning opportunities. However: therein lies the problem: An activity established for self-directed learning is no longer a self-directed learning activity. **RESOURCES.** Using Fink’s Significant Learning (2003, 2013) as a conceptual framework, we describe our experiences to institute opportunities for self-directed learning amongst pre-professional undergraduate students. After establishing high-order learning objectives for our Human Anatomy course to foster life-long learning attributes in students, we designed a Teaching Assistant (TA) training program to transform the laboratory classroom from a didactic to an engaged learning environment that helped students discover opportunities for self-directed and study group learning. **DESCRIPTION.** Our TA training program includes the following elements: continuing education, self- reflections, opportunities to improve classroom infrastructure and/or content delivery, and pedagogical training. An analysis of reflections reveals that TA’s are more cognizant of their efforts, and better equipped to help students become self- directed learners when they have specific tools to help them establish a life-long learning environment. **SIGNIFICANCE.** Whether in a pre-professional or professional school learning environment, having TA’s trained to help students transition from being didactic learners to self-directed learners can have a meaningful impact in the quality of learning.