

American Association of Clinical Anatomists ANNUAL MEETING



1300



American
Association
of Clinical
Anatomists

JUNE
17-21 **2024**

Hosted by Weill Cornell Medicine



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Medicine**

NEW YORK CITY

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Dear Fellow AACA Members,

Weill Cornell Medicine in New York City is proud to host the 41st Annual Meeting of the American Association of Clinical Anatomist (AACA), June 17th to 21st, 2024. All meeting sessions will take place at various locations within Weill Cornell Medicine's campus. All within walking distance. The post-graduate course will be hosted by the Anatomy Division of WCM, in collaboration with Dr. St. George from Emergency Medicine Department. WCM is in the Upper Eastside of NY and only a train stop away from many sightseeing locations within NYC. The following information listed below and on the AACA meeting website will help you plan for your visit.

Weather: June weather is usually around 60sF to 80sF. Some days could be very hot and/or humid. Rain and thunderstorms occasionally. Lots of local stores to pick up necessities like sunblock, toiletries, water and/or food.

Transportation:

Airports: John F. Kennedy International Airport (JFK) (19miles), LaGuardia Airport (LGA) (9.3miles), Newark Liberty International Airport (EWR- located in New Jersey) (22miles)

Local: Taxis, Uber, Lyft, and Mass Transit Available
MTA (Subway, Bus, and Railroad) <https://new.mta.info/>
MTA fares <https://new.mta.info/fares>

Hotel Accommodations:

[Nearby Hotel Suggestions](#)

The Gardens Sonesta ES Suites New York

215 E 64th St, New York, NY 10065
0.6 miles away from Weill Cornell Medicine

Courtyard by Marriott New York Manhattan/Midtown East

866 3rd Ave, New York, NY 10022
1.3 miles away from Weill Cornell Medicine

Hilton Garden Inn New York/Manhattan-Midtown East

206 E 52nd St, New York, NY 10022
1.3 miles away from Weill Cornell Medicine

Check out other local hotels within Manhattan (New York) <https://www.hotels.com/>

Points of Interest: There are vast variety of things to do while visiting NYC. Some popular places to visit: Statue of Liberty, Ellis Island, the Empire State Building, Times Sq, Central Park/Zoo, Broadway shows, The High Line, The Circle line, Museum of Natural History, The 9/11 Memorial, Brooklyn Bridge, The Bronx Zoo (celebrating 125yrs), NYC Aquarium (Queens), Coney Island, METS or Yankee Baseball games, and so much more. Many places you can walked too, take a cab, or even travel by MTA. Lots of travel options are available.

https://www.tripadvisor.com/Attractions-g60763-Activities-New_York_City_New_York.html

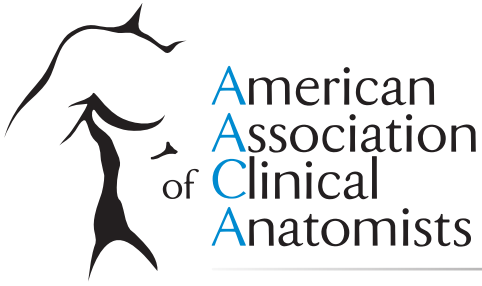
Museum mile: <https://www.nyc-arts.org/collections/32777/museum-mile-2/>

Post-Graduate Course: Friday, June 21, 2024. The post graduate course will take place at Weill Cornell Medicine. "Protected Airway Course" from 8am to 11:00, 1300 York Ave- B Corridor 2-FI, Rooms: A [B210], B [B212], C [B214], D [B216], E [B211], F [B213], G [B215], H [B217]and the Anatomy Lab room A01 (Basement).

Welcome to NY!

**Dr. Estomih Mtui, Dr. Santosh Sangari, Dr. Ritwik Baidya, Dr. Sushil Kumar,
Dr. Kathleen Bubb, and Dr. Tanya Maistry**

Weill Cornell Medicine
AACA 41st Annual Meeting Local Hosts



President's Report

June 17-21, 2024
AACA Annual Meeting

PO Box 2945
LaGrange, Ga 30241
Ph: 706-298-0287

www.clinical-anatomy.org

Dear Esteemed AACA Members and Guests,

With great pleasure, we warmly welcome each of you to this year's annual meeting in New York. We sincerely appreciate your attendance and trust that this gathering will provide a stimulating platform for scientific discourse and educational advancement.

We encourage you to fully engage in the diverse array of presentations and discussions tailored to enrich your understanding of the anatomical sciences from a clinical point of view. This meeting presents a unique opportunity to network and exchange ideas with esteemed colleagues and anatomists from across the globe. We extend a special welcome to our new members and first-time attendees, whose presence enriches the fabric of our Association.

The success of our annual meetings is indebted to the collaborative efforts of many. First, we express our sincere gratitude to our hosts, Dr. Estomih Mtui and Weill Cornell Medicine, whose generous contributions have greatly enhanced the quality of this year's event. Dean Robert Harrington and Dr. Robert Min, Chair of Radiology, both overwhelmingly supported our meeting at Weill Cornell Medicine. Secondly, we appreciate the vendors who have supported this year's AACA annual meeting. We encourage you to visit their booths and acknowledge their invaluable contributions to our Association. Lastly, we extend our heartfelt thanks to the ASG and MOPP committee for their exemplary management and coordination, which has been instrumental in our success.

As you immerse yourself in the enriching experiences of New York and our annual meeting, we encourage you to seize every opportunity for learning, networking, and collaboration. Together, let us make this gathering a resounding success.

With warm regards,

R. Shane Tubbs
President, American Association of Clinical Anatomists

The AACA believes that each conference attendee should be treated with respect and dignity and that any form of sexual harassment is a violation of human dignity. The AACA condemns sexual harassment and maintains a "zero - tolerance" for sexual harassment. All conference attendees have the right to participate and learn free of sexual harassment. The AACA will take all reasonable efforts to prevent and promptly correct instances of sexual harassment. Any conference attendee who believes himself or herself to be a victim of sexual harassment is encouraged to report the information to the Program Secretary.

AACA on Social Media



News



Events



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American Association of Clinical Anatomists

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Or scan with your phone using any QR code reader



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@AACAnatomy is the Association's official Twitter account

We use Twitter to increase engagement with our Membership, professionals, and the public.

Join us on Twitter!

New to Twitter?

Use these steps to make an account!

1. Go to www.twitter.com
2. Click Log-in
3. Select Sign Up under "New to Twitter?"
4. Create username and password
5. Sign Up!
6. Find our account @AACAnatomy and follow
7. Tweet away! Share tweets all meeting long using the conference hashtag **#ClinAnat24**

Already on Twitter?

Follow @AACAnatomy and share conference tweets using the hashtag **#ClinAnat24!** Feel free to tweet anything that interests you during the conference – sessions, events, what you learn, posters, social gatherings, meetings, photos, etc. You can also tweet anytime using the hashtag **#ClinAnat**.



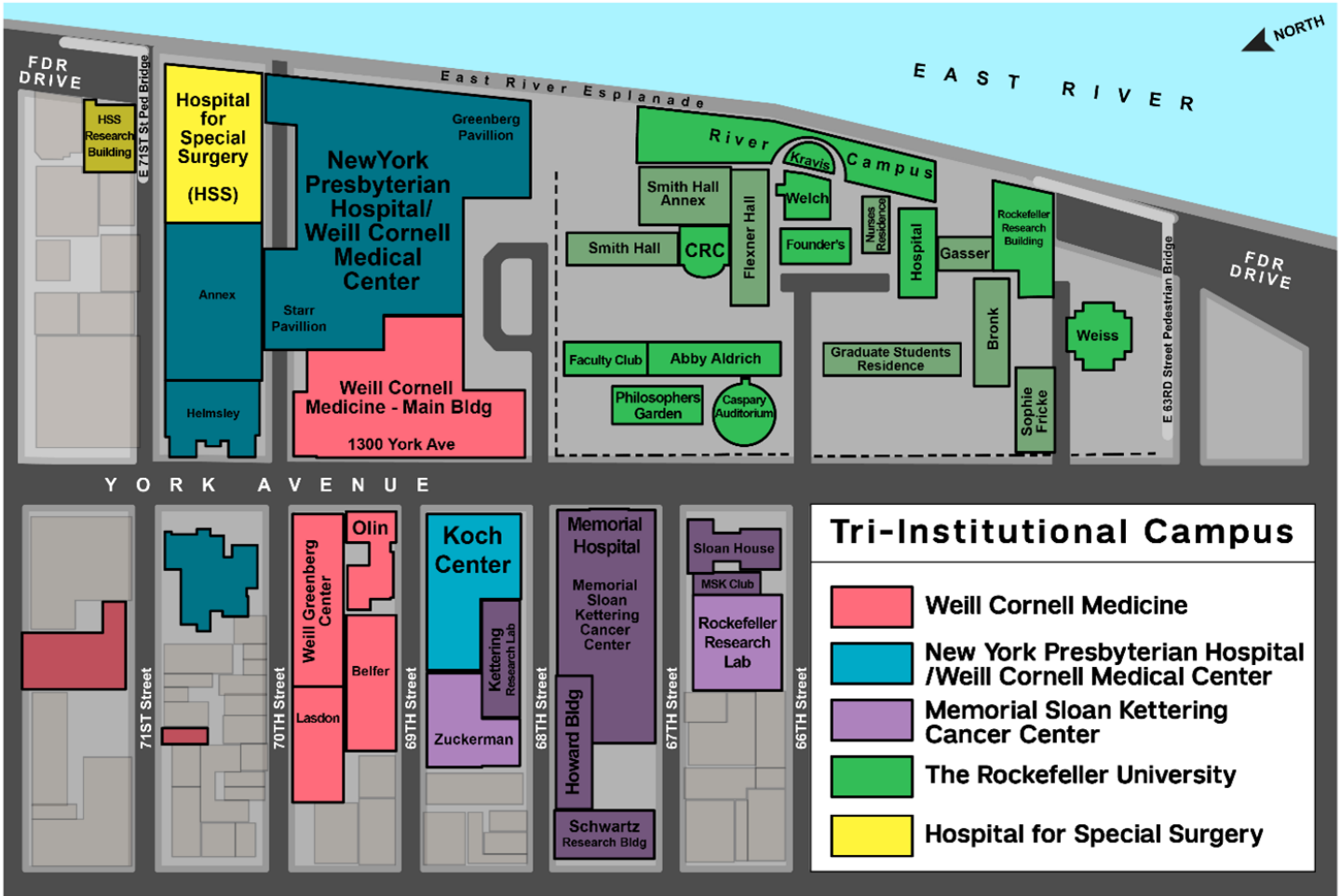
Ask your colleagues if they have a Twitter account. Follow AACA members and colleagues to make our Twitter community even stronger!

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Weill Cornell Medicine Campus Map



Weill Cornell Medicine (Main Building)

Uris Auditorium
 Griffis Faculty Club
 A-126 Room
 1300 York Avenue

Belfer (Belfer Research Building/BRB)

Belfer Terrace
 Belfer 2nd Floor
 Belfer 3rd Floor
 413 East 69th Street

2024 AACA Annual Meeting at a Glance

		Monday, June 17	Tuesday, June 18		Wednesday, June 19		
			Registration Open 7:30 am - 5:00 pm Location: Outside Uris Auditorium		Registration Open 7:30 am - 5:00 pm Location: Outside Uris Auditorium		
7:30	AACA Council Meeting 7:00 am - 12:30 pm Location: A-126		Anatomy Career Connections Breakfast CDC Committee Meeting 7:30 am - 9:00 am Location: Griffis Faculty Club	Continental Breakfast with Exhibitors & Posters 7:30 am - 9:00 am Location: Belfer 3rd Floor	ASC Committee Breakfast Meeting 7:30 am - 9:00 am Location: Griffis Faculty Club	Continental Breakfast with Exhibitors & Posters 7:30 am - 9:00 am Location: Belfer 3rd Floor	
7:45		Registration Open 12:00 pm - 5:00 pm Location: Outside Uris Auditorium 1300 York Ave - WCM					
8:00							
8:15							
8:30							
8:45							
9:00			BREAK		BREAK		
9:15			Exhibitor Setup 12:00 pm - 5:00 pm Location: Belfer 3rd Floor	Welcome by AACA President, WCM Dean, and Others 9:15 am - 9:45 am		Platform Presentations Session 1 9:15 am - 10:30 am Location: Uris Auditorium	
9:30				Presidential Speaker 9:45 am - 10:45 am Location: Uris Auditorium		BREAK	
9:45				BREAK		Poster Session 2 with Exhibitors & Coffee 10:45 am - 11:45 am Location: Belfer 3rd Floor	
10:00			Coffee Break with Exhibitors 11:00 am - 11:45 am Location: Belfer 3rd Floor				
10:15				BREAK		BREAK	
10:30				DEIC Committee Lunch Meeting 12:00 pm - 1:30 pm Location: Griffis Faculty Club		EAC Committee Lunch Meeting 12:00 pm - 1:30 pm Location: Griffis Faculty Club	
10:45			Clinical Anatomy Editorial Lunch Meeting 12:00 pm - 1:00 pm Location: A-126				
11:00				BREAK		BREAK	
11:15				ASC Committee Symposium 1:45 pm - 3:00 pm Location: Uris Auditorium		Platform Presentations Session 2 1:45 pm - 3:00 pm Location: Uris Auditorium	
11:30			BREAK				
11:45				Poster Session 1 with Exhibitors & Coffee 3:15 pm - 4:15 pm Location: Belfer 3rd Floor		Poster Session 3 with Exhibitors & Coffee 3:15 pm - 4:15 pm Location: Belfer 3rd Floor	
12:00			BREAK				
12:15				TechFair Presentations 4:30 pm - 6:00 pm Location: Belfer 2nd Floor		Platform Presentations Session 3 4:30 pm - 6:00 pm Location: Uris Auditorium	
12:30		BREAK					
12:45			Judges' Orientation Meeting 5:30 pm - 6:30 pm Location: Uris Auditorium		Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		
1:00		BREAK					
1:15			Weill Cornell Special Speaker and Reception The Papanicolaou Lecture - Dr. Abha Goyal 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
1:30		BREAK					
1:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
2:00		BREAK					
2:15			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
2:30		BREAK					
2:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
3:00		BREAK					
3:15			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
3:30		BREAK					
3:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
4:00		BREAK					
4:15			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
4:30		BREAK					
4:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
5:00		BREAK					
5:15			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
5:30		BREAK					
5:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
6:00		BREAK					
6:15			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
6:30		BREAK					
6:45			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
7:00		BREAK					
>7 pm			Opening Reception 6:30 pm - 8:30 pm Location: Belfer Terrace		Anatomy Trivia with Snacks and Drinks 6:30 pm - 8:30 pm Location: Belfer 2nd Floor		
		BREAK					

Continued 2024 AACA Annual Meeting at a Glance

	Thursday, June 20		Friday, June 21
	Registration Open 7:30 am - 5:00 pm Location: Outside Uris Auditorium		Registration Open 7:30 am - 11:00 am Location: Outside Uris Auditorium
7:30	CAT Committee Breakfast Meeting 7:30 am - 9:00 am Location: Griffis Faculty Club		Continental Breakfast with Exhibitors & Posters 7:30 am - 9:00 am Location: Belfer 3rd Floor
7:45			
8:00			
8:15			
8:30			
8:45	BREAK		Post Graduate Course 8:00 am - 11:00 am Location: Weill Cornell Medicine
9:00	EAC Committee Symposium 9:15 am - 10:30 am Location: Uris Auditorium		
9:15			
9:30			
9:45			
10:00			
10:15	BREAK		
10:30	Coffee Break with Exhibitors 10:45 am - 11:45 am Location: Belfer 3rd Floor		
10:45			
11:00			
11:15	BPOC Committee Lunch Meeting 11:45 am - 1:15 pm Location: Griffis Faculty Club	Council Awards Decision Lunch 11:45 am - 1:15 pm Location: Griffis Main Dining Room	Career Development Committee (CDC) Awards Decision Lunch 11:45 am - 1:15 pm Location: A-126
11:45			
12:00			
12:15			
12:30	BREAK		
12:45	DEIC Symposium 1:30 pm - 2:45 pm Location: Uris Auditorium		
1:00			
1:15			
1:30			
1:45			
2:00	BREAK		
2:15	AACA Annual Member's Business Meeting and Awards 3:00 pm - 4:30 pm Location: Uris Auditorium		
2:30			
2:45			
3:00			
3:15			
3:30	Awards Reception and Celebration 4:30 pm - 5:30 pm Location: Belfer Terrace		
3:45			
4:00			
4:15			
4:30			
4:45	BREAK		
5:00	AACA New Council Meeting 5:45 pm - 6:15 pm Location: A-126		
5:15			
5:30	BREAK		
5:45			
6:00			
6:15			
6:30			
6:45			
7:00			
>7 pm			

Sponsors/Commercial Exhibitors

Generous donations and commercial exhibitor fees paid by the following companies and organizations have substantially reduced the Association's expenses in presenting this meeting. You are encouraged to visit the exhibits available for viewing in the Belfer Research Building (BRB) on the 3rd Floor.

Exhibit hours:

12:00 pm – 5:00 pm Monday (set up)

7:30 am – 12:00 pm and 1:00 pm – 5:00 pm Tuesday

7:30 am – 12:00 pm and 1:00 pm – 5:00 pm Wednesday

7:30 am – 11:45 am Thursday

TEAR DOWN is from 12:00 pm – 4:00 pm on Thursday
(all exhibitors must be vacated from the hall at 4:00 pm)

*The hall will be closed for lunch for one hour each day (12:00 – 1:00 PM)

LIST OF EXHIBITORS (as of 5.25.2024)

3D Organon | Medis Media Pty Ltd

Booth #6/7

Unit 11, Township Drive
Burleigh Heads, Queensland 04220
Australia

www.3dorganon.com

3D Organon is a medical & healthcare education platform for teaching and learning anatomy across virtual reality, desktop, tablet, and mobile devices. 3D Organon VR Anatomy, 3D Organon's prime solution, is the world's first fully-featured VR anatomy software.

Anatomage, Inc.

Booth #14/15

3350 Thomas Rd., Suite 150
Santa Clara, CA 95054
USA

www.anatomage.com

Anatomage is a medical company, driving innovation through advanced solutions in hospitals and educational institutions. Our digital cadaver table, the Anatomage Table, allows a hands-on approach to learning the human body through unique visualization options, dissection tools, and quiz mode features, making it a strong asset to any anatomy class.

Anatomic Excellence, LLC | von Hagens Plastination

Booth #2/3

22 Angel Oaks Dr
Savannah, GA 31410
USA

www.anatomicexcellence.com

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Dodge

Booth #1

9 Progress Road
Billerica, MA 01821
USA

www.dodgeco.com

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Elsevier

Booth #12/13

1600 John F Kennedy Blvd. Suite
1600

Philadelphia, PA 19103

USA

<https://www.elsevier.com/education/welcome-3d4medical>

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Frigid Fluid

Booth #8

11631 W. Grand Ave.

Northlake, IL 60164

USA

www.frigidfluid.com

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continued on next page

Medvision**Booth #14**

14300 Carlson Circle
Tampa, FL 33626
USA

<https://www.medvisionsim.com/>

At MedVision, we're driven by a passion for advancing medical education and enhancing patient care. With a rich history of innovation and a commitment to excellence, we continually push the boundaries of medical simulation technology to empower healthcare professionals worldwide.

Mopec**Booth #16/17**

800 Tech Row
Madison Heights, MI 48071
USA

Mopec provides American-made equipment and supplies to anatomy laboratories, pathology labs, animal research facilities and medical examiner facilities. Founded in 1992, Mopec solutions are among the very best as demonstrated by the vast number of installations in America's top healthcare institutions and universities. Our reputation is built on decades of superior customer service specializing in consultation and customization. Mopec is committed to designing and manufacturing ergonomic equipment to enhance your lab's safety, flexibility, and productivity.

Scimedico**Booth #19**

4142 Ogletown-Stanton Rd, #900
Newark, DE 19713
USA

www.scimedico.com

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TDS Health**Booth #11**

235 E Broadway
Jackson, WY 83001
USA

www.tetondata.com

Anatomy and Physiology E-Learning Resources

Touch of Life Technologies**Booth #4/5**

12635 E. Montview Blvd., Suite 350
Aurora, CO 80045
USA

www.toltech.net

Touch of Life Technologies (Toltech) is a full solutions provider for anatomical hardware and software. Through a broad range of solutions, Toltech enables users to expand the learning experience in and out of the lab or classroom. Decades of research and development have culminated in the VH Dissector

platform which enables students and educators around the world to interact with real human anatomy on a variety of devices from collaborative multi-touch tables to iPads and AR and VR devices.

Wolters Kluwer**Booth #10**

2001 Marker Street
Philadelphia, PA 19103
USA

www.lww.com

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Visible Body**Booth #9**

205 Newbury St. Suite 204
Framingham, MA 01701
USA

www.visiblebody.com

Visible Body's best in class 3D AR human anatomy and physiology apps, labs, teaching, and learning platforms improve in class and online education while making learning anatomy easy and fun.

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June 16-19 in Seattle's Eastside | Bellevue, WA**

clinical-anatomy.org

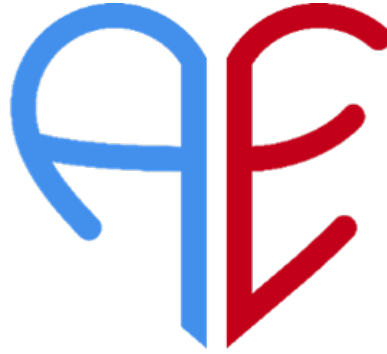
American Association of Clinical Anatomists

2025 annual meeting
JUNE 16-19

Hyatt Regency Bellevue on Seattle's Eastside | Bellevue, WA

2024 Annual Meeting Sponsor

Gold Level



Anatomic Excellence

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We would like to thank our 2023 Giving Tuesday Donor:
Jennifer Burgoon, PhD - Ruby Member Sponsor

Pre Meeting Events

Monday, June 17

7:00AM – 12:30PM	AACA Council Meeting - Invitation Only.....	A-126
12:00PM – 5:00PM	Conference Registration	Outside Uris Auditorium
12:00PM – 5:00PM	Exhibitor Setup - Exhibitors Only	Belfer 3rd Floor
6:30PM – 8:30PM	Opening Reception With Illustrator Dan Thompson	Belfer Terrace

Scientific Program

Tuesday, June 18

7:30AM – 5:00PM	Conference Registration	Outside Uris Auditorium
7:30AM – 9:00AM	Anatomy Career Connections Breakfast CDC Committee Meeting	Griffis Faculty Club
7:30AM – 9:00AM	Continental Breakfast with Exhibitors.....	Belfer 3rd Floor
9:15AM – 9:45AM	Welcome by AACA President and Others	Uris Auditorium
	Robert A. Harrington, MD, Stephen and Suzanne Weiss Dean, Weill Cornell Medicine, Provost for Medical Affairs, Cornell University	
	Robert J. Min, MD, MBA, John A. Evans Professor of Radiology, Chair of Radiology and Radiologist-in-Chief, President of Weill Cornell Imaging at New York-Presbyterian, President & CEO of Weill Cornell Medicine Physician Organization	
9:45AM – 10:45AM	Presidential Speaker	Uris Auditorium
11:00AM – 11:45PM	Coffee Break with Exhibitors	Belfer 3rd Floor
12:00PM – 1:00PM	<i>Clinical Anatomy</i> Editorial Lunch Meeting – Invitation Only	A-126
12:00PM – 1:30PM	DEIC Committee Lunch Meeting.....	Griffis Faculty Club
1:45PM – 3:00PM	ASC Committee Symposium.....	Uris Auditorium
3:15PM – 4:15PM	Poster Session 1 with Exhibitors and Coffee.....	Belfer 3rd Floor
4:30PM – 6:00PM	TechFair Presentations.....	Belfer 2nd Floor
4:30 PM	<u>Using a 3D Printed Mold to Ensure Anatomical Positioning of a Fresh Brain for Accurate Evaluation.</u> *BISHOP, Keith N.	
4:35 PM	<u>Guidelines for Clinical Anatomy Educators to Create High-Quality Electronic Flashcards.</u> *SPARLING, Matthew R., Kathleen B. ALSUP, Glenn M. FOX, Philip H. BARRISON, Alexandra H. VINSON, and Emily A. BALCZEWSKI.	
4:40 PM	<u>TAKAI: Generative AI for Teaching Anatomy.</u> *CEVALLOS, Manuel E. ¹ , Steven L. FERNANDES ² , and Carina COOK ² .	
4:45 PM	<u>The Use of 3D Printed Models in Conjunction with Cadaveric Anatomy Teaching.</u> *BUSECK, Alison, Carsyn DYKES, Jason HORTON, and Jennette BALL.	
4:50 PM	<u>3D Reconstruction and Printing of Skulls for Medical Education.</u> *KALIDINDI, Yuktesh V. ¹ , Daniel T. DALY ^{1,2} , and Jay M. BAUMAN ^{1,2} .	
4:55 PM	<u>Smartphone Thermal Angiography Screening for Carotid Stenosis: A Cadaveric Study.</u> *SMITH, Cameron T. ¹ , Omer RIYADH ¹ , Morgan W. STEWART ¹ , Chloe N. MAYE ¹ , Dominic E. MAIURO ¹ , Swathi SRIDHAR ¹ , Robert A. HILLARD ¹ , Lyon HOUGH ¹ , J. P. BROOKS ² .	
5:00 PM	<u>Integration of Oral Histology Lecture and Lab Materials into a Comprehensive Learning Experience.</u> *MACPHERSON, Brian R. ¹ and James G. TIEMAN ² .	
5:05 PM	<u>AIATELLA in Clinical Anatomy & Imaging: An International Multi-Centre Case Study.</u> *COEY, James ^{1,2} and Jack PARKER ² .	
6:30PM – 8:30PM	The Papanicolaou Lecture and Reception - Dr. Abha Goyal	Belfer 2nd floor
	Sponsored By: Weill Cornell Medicine	

continued on next page

Wednesday, June 19

7:30AM – 5:00PM	Conference Registration	Outside Uris Auditorium
7:30AM – 9:00AM	ASC Committee Breakfast Meeting	Griffis Faculty Club
7:30AM – 9:00AM	Continental Breakfast with Exhibitors.....	Belfer 3rd Floor
9:15AM – 10:30AM	Platform Presentations Session 1.....	Uris Auditorium
9:15 AM	<u>Three-Dimensional Analysis of Facial Muscles at Corners of Mouth Using Micro-Computed Tomography.</u> *HAIKATA, Yuto ^{1,2} , Aya HAN ¹ , Yoko TABIRA ¹ , Keishiro KIKUCHI ¹ , Eiko INOUE ¹ , Joe IWANAGA ^{1,3,4} , Jingo KUSUKAWA ² , Tsuyoshi SAGA ⁵ , and Koichi WATANABE ¹	
9:30 AM	<u>Newly Revealed Anatomy of the Bucinator: Three-Dimensional Analysis with Clinical Applications.</u> *IWANAGA, Joe ^{1,3} , Keiko FUKINO ³ , Norio KITAGAWA ³ , and R. Shane TUBBS ^{1,2} .	
9:45 AM	<u>Intramuscular Course of the Greater Occipital Nerve: Implications in Occipital Neuralgia.</u> *LESSER, Emma R., Chung Yoh KIM, Juan J. CARDONA, Keishiro KIKUCHI, Aaron S. DUMONT, Joe IWANAGA, and R. Shane TUBBS.	
10:00 AM	<u>Efficacy of AR-Guided Nerve Blocks Among Anesthesiology Residents and Attendees.</u> *NOEL, Geoffroy ¹ , Cheyenne MERCER ¹ , Amir MORADI ¹ , Steven HOWE ¹ , Jack RYAN ² , Joy BALTA ¹ , and Preetham SURESH ²	
10:15 AM	<u>Characterization of Stenosis in Midwestern (US) Cadavers with Circle Of Willis (CoW) Variation.</u> *SRIDHAR, Swathi, Dominic E. MAIURO, Chloe N. MAYE, Cameron T. SMITH, Phil T. SHERIDAN, Farida MEHRHOFF, and Robert A. HILLARD.	
10:45AM – 11:45AM	Poster Session 2 with Exhibitors and Coffee	Belfer 3rd Floor
12:00PM – 1:30PM	EAC Committee Lunch Meeting.....	Griffis Faculty Club
1:45PM – 3:00PM	Platform Presentations Session 2	Uris Auditorium
1:45 PM	<u>Innervation of Posterior Elbow Joint Capsule: Clinical Implications for Treating Elbow Joint Pain.</u> *ARNOLD, Denise M.J. ¹ , Emily S. HO ² , Sharon SWITZER-MCINTYRE ³ , and Anne M.R. AGUR ¹ .	
2:00 PM	<u>Relationship of Saphenous Nerve to Medial Genicular Nerve: Implication for Knee Joint Denervation.</u> *YU, Paula J., John TRAN, and Anne M.R. AGUR.	
2:15 PM	<u>The Role of Aortic Root Anatomy in Transcatheter Aortic Valve Replacement: A Cadaveric Study.</u> *MAYE, Chloe N., Cameron T. SMITH, Swathi SRIDHAR, Dominic E. MAIURO, and Robert A. HILLARD.	
2:30 PM	<u>Comparative Microbiological Analysis of Human Bodies Embalmed with Soft-Preservation Techniques.</u> *NOEL, Geoffroy ¹ , Sarah BEYDOUN ² , and Gabriel VENNE ² .	
2:45 PM	<u>Preparation of a Consented Donor for Educational Use as a Skeleton in the Anatomy Lab.</u> *WILSON, Amanda R. ¹ , Howard M. BROOKS ¹ , and Steven LABRASH ² .	
3:15PM – 4:15PM	Poster Session 3 with Exhibitors and Coffee	Belfer 3rd Floor

continued on next page

4:30PM – 6:15PM	Platform Presentations Session 3	Uris Auditorium
4:30 PM	<u>In Situ Intact Cranial Nerve and Pathway Dissection via Stepwise Hemispherectomy.</u> *MOVINSKY, Cassandra L., Brittany E. KENNEDY, Jessica L. CAMMARATA, Joseph M. KRILICH, and Mattie R. BOSSLER.	
4:45 PM	<u>Hands-On Anatomy Centered Ultrasound Affects eFAST Exam Performance: A Randomized Controlled Trial.</u> *BUENTING GRITTON, A. Cory ¹ , Tony HARPER ¹ , Adam KOLATOROWICZ ¹ , and Jeffrey A. CHESNUT ² .	
5:00 PM	<u>Can AI Make You a More Efficient Educator? Successes and Failures of Grading with AI.</u> *MEYER, Carolyn A., Kenneth R. IVIE, Brian P. KELLY, Brandon LOWRY, Chad EITEL, Heather HALL, and Tod R. CLAPP.	
5:15 PM	<u>Anatomy Video Dialogs: A Tool to Stimulate Student Engagement in Surgical First Assistant Course.</u> *PANDALAI, Uma ¹ , Punnose K. KATTIL ¹ , Yolanda SALINAS-ALVAREZ ¹ , Helga N. OLSON ² , Jadran, QURRATULAIN ¹ , and Wojciech PAWLINA ¹ .	
5:30 PM	<u>Measuring Changes in Teamwork Competency Domains in the Medical Gross Anatomy Laboratory Experience.</u> *BRUECKNER-COLLINS, Jennifer and Emily PORTA.	
5:45 PM	<u>Integrating Disability into Functional Anatomy through an Introduction to Adaptive Equipment.</u> *WINK, Alexandra E.	
6:30PM – 8:30PM	Anatomy Trivia with Snacks and Beverages	Belfer 2nd Floor <i>Separate Registration Required</i>

Thursday, June 20

7:30AM – 5:00PM	Conference Registration	Outside Uris Auditorium
7:30 AM – 9:00 AM	CAT Committee Breakfast Meeting.....	Griffis Faculty Club
7:30AM – 9:00AM	Continental Breakfast with Exhibitors.....	Belfer 3rd Floor
9:15AM – 10:30 AM	EAC Committee Symposium.....	Uris Auditorium
10:45AM – 11:45AM	Coffee with Exhibitors	Belfer 3rd Floor
11:45PM – 1:15PM	Career Development Committee (CDC) Awards Decision Lunch	A-126
1:30PM – 2:45PM	DEIC Symposium	Uris Auditorium
3:00PM – 4:30PM	AACA Member's Business Meeting.....	Uris Auditorium
4:30PM – 5:30PM	Awards Reception and Celebration.....	Uris Auditorium
5:45PM – 6:15PM	AACA New Council Meeting – Invitation Only	A-126

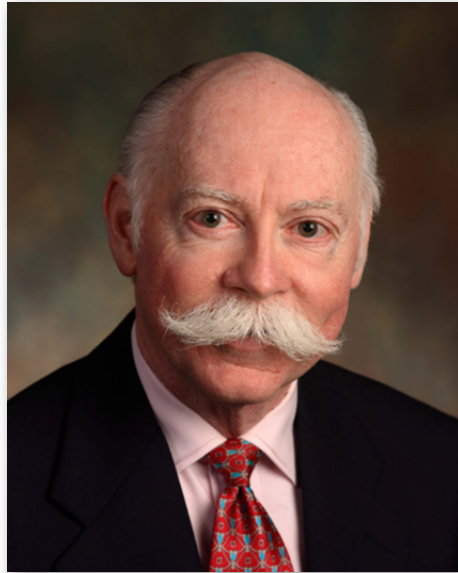
Friday, June 21

7:30AM – 11:00AM	Conference Registration	Outside Uris Auditorium
8:00AM – 11:00 AM	Post Graduate Course.....	Weill Cornell Medicine

Honored Member 2024

The American Association of Clinical Anatomists
Recognizes and Awards Honored Membership to

Michael F. Nolan, Ph.D., P.T.



Dr. Nolan received his Ph.D. in Anatomy from the Medical College of Wisconsin in 1975. Upon graduation he took a position in the Anatomy Department of the College of Medicine at the University of South Florida where he taught gross anatomy to medical students and orthopedic surgery residents and neuroanatomy to medical students, graduate students, physical therapy students, neurology residents, and neurosurgery residents. During that time he won 19 teaching awards for undergraduate medical teaching, four for teaching in the neurology residency program and the John M. Thompson, MD Award for teaching in the neurosurgery resident program. He was chosen as Marquette University Distinguished Physical Therapy Alumnus in 1992 and Medical College of Wisconsin Graduate School Alumnus of the Year in 2016. In 2014 he received the Master Teacher Award from the International Association of Medical Science Educators.

In 2009, after 34 years at the University of South Florida, he relocated to Roanoke VA., where as Professor of Basic Science and Director of Assessment, he worked to establish the preclinical curriculum of the new Virginia Tech Carilion School of Medicine. From 2016-2019 he served as Assistant Dean for Basic Science Education. In addition to his contributions to undergraduate teaching, Dr. Nolan developed and taught clinical neuroanatomy in the Carilion Clinic neurology and neurosurgery residency programs which he continues to this date.

He is the author of over 30 peer reviewed publications and seven books on topics in neuroanatomy and gross anatomy.

Previous Honored Member Award Recipients

1984 – W. Henry Hollinshead*
1985 – Chester B. McVay*
1986 – Donald James Gray*
1987 – Russell T. Woodburne*
1988 – Oliver Beahrs*
1989 – N. Alan Green*
1990 – Frank H. Netter*
1991 – Ralph Ger*
1992 – M. Roy Schwarz
1993 – Carmine D. Clemente*

1994 – Keith L. Moore*
1995 – Ray J. Scothorne*
1996 – Robert A Chase
1997 – Tatsuo Sato
1998 – John E. Skandalakis*
1999 – Donald R. Cahill*
2000 – Sandy C. Marks, Jr.*
2001 – David G. Whitlock*
2002 – Robert D. Acland*
2003 – Arthur F. Dalley, II

2004 – John V. Basmajian*
2005 – Ian Whitmore
2006 – Peter H. Abrahams
2007 – Gary Wind
2008 – T.V.N. (Vid) Persaud
2009 – Richard S. Snell
2010 – Raymond F. Gasser
2011 – Harold Ellis
2012 – Ronald A. Bergman
2013 – John Hansen

2014 – Victor M. Spitzer
2015 – Carol E. Scott-Conner
2016 – Carlos Machado
2017 – James D. Collins*
2018 – Anne Agur
2019 – Robert Anderson
2020 – Stephen W. Carmichael
2021 – Susan Stranding
2022 – Cornelius Rosse
2023 – Bernell Dalley

* deceased

R. Benton Adkins, Jr. Distinguished Service Award 2024

The American Association of Clinical Anatomists

Recognizes and Awards the R. Benton Adkins, Jr. Distinguished Service Award to

Ameed Raroof, MD, PhD



Ameed Raroof, MD, PhD, currently serves as a Faculty of Biomedical Sciences at Kaiser Permanente School of Medicine in Pasadena, California, USA. With a diverse educational background, Dr. Raroof obtained his MBChB (MD) and MSc in Anatomy from the University of Baghdad, College of Medicine, Baghdad, Iraq, before pursuing his PhD in Anatomy from the University of Dundee, Scotland, U.K., where he also completed a Diploma in Medical Education. Dr. Raroof's academic journey has seen him hold various esteemed academic appointments, including Associate Professor positions at Weill Cornell Medical College in Qatar, Oakland University William Beaumont School of Medicine in Michigan, and Head of Department of Anatomy at St. Helen School of Medicine in St. Lucia, West Indies. Prior to his current role, he held several directorial positions at the University of Michigan Medical School, Ann Arbor, MI, USA. Throughout his career, Dr. Raroof has been recognized for his teaching excellence and contributions to medical education, receiving numerous awards and accolades. His research interests span a wide range of topics in medical education, with a particular focus on utilizing immersive technology and innovative teaching methods to enhance anatomy education. Dr. Raroof has also made significant contributions to the field of plastination, including establishing plastination labs and organizing international conferences. He has mentored numerous students in medical education research and served in leadership roles in various professional organizations. Dr. Raroof has authored several impactful publications, contributing to the advancement of medical education and anatomical sciences.

Previous R. Benton Adkins, Jr. Distinguished Service Award Recipients

- 2004 – Robert J. Leonard
- 2006 – Daniel O. Graney
- 2007 – Ralph Ger*
- 2009 – Arthur F. Dalley, II
- 2011 – Carol Scott-Conner
- 2012 – Keith L. Moore*
- 2013 – Stephen W. Carmichael
- 2015 - Lawrence M. Ross*
- 2016 – Thomas Quinn
- 2017 – Ronald S. Wade
- 2019 – Brian R. MacPherson, Ph.D.
- 2020 – Neil S. Norton, Ph.D.*
- 2021 – Fiona Stewart, MB BS (Syd) BSc(UNE) FACBS MACLM
- 2023 – Gregory R. Smith, MS

* deceased

Presidential Speaker
Tuesday, June 18 | 9:45 AM - 10:45 AM
Bill Hayes



“Dissecting Gray's Anatomy”

The classic medical text known as *Gray's Anatomy*, published in 1858, remains one of the most well known books in the English language. More than 160 years later, it has never gone out of print and its publication is recognized as a turning point in medical history. Despite the book's legacy, little was known about its author and illustrator until acclaimed science writer and memoirist Bill Hayes came across a photograph of Henry Gray that seized his curiosity and inspired his nonfiction book *The Anatomist: A True Story of Gray's Anatomy*. In this program, Hayes articulates the medical, historical, and artistic significance of *Gray's Anatomy*; shares the fascinating tale of its creation, which he pieced together largely from long-forgotten letters and diaries written by the book's original illustrator, anatomist Henry Vandyke Carter; and describes his unforgettable experience of a year spent in an anatomy lab, alongside medical students at UCSF, performing many of the dissections originally detailed by Gray and Carter.

Biography:

The recipient of a Guggenheim Fellowship in nonfiction, Bill Hayes is a frequent contributor to the *New York Times* and the author of seven books, including *Sleep Demons*; *Five Quarts*; *The Anatomist*; *Insomniac City*; and *How We Live Now: Scenes from the Pandemic*. His writing has also appeared in *The Wall Street Journal*, *The New York Review of Books*, the *New York Times* “T” Style Magazine, *BuzzFeed*, and *The Guardian*. His new book, *SWEAT: A History of Exercise*, a narrative nonfiction look at exercise from antiquity to the present, is available now wherever books are sold. Hayes is also a photographer, with credits including *The New Yorker*, *Vanity Fair*, and the *New York Times*. His portraits of his partner, the late Oliver Sacks, appear in the volume of Dr. Sacks's suite of final essays *Gratitude*. A collection of his street photography, *How New York Breaks Your Heart*, was recently published by Bloomsbury. His photographs have been exhibited at the Steven Kasher Gallery and at The Association of International Photography Art Dealers (AIPAD), New York City. Hayes has lectured at NYU, UCSF, and University of Virginia, and has appeared at the Sydney Writers Festival, the 92nd Street Y, the Times of India (Mumbai) LitFest, and other venues. He serves as a co-editor of Dr. Sacks' posthumously published work. Hayes, 61, lives in New York.

The Papanicolaou Lecture & Reception

Tuesday, June 18 | 6:30 PM - 8:30 PM

Dr. Abha Goyal



Biography:

Dr. Goyal is an Associate Professor of Clinical Pathology and Laboratory Medicine at Weill Cornell Medicine and an Associate Attending Pathologist at New York Presbyterian Hospital. Her areas of practice are cytopathology and gynecologic surgical pathology. She is a graduate of Lady Hardinge Medical College, New Delhi (India). She did her pathology residency (Anatomic and Clinical) at University of Texas Health Science Center at Houston (Houston, TX) and at NSLIJHS/Hofstra North Shore-LIJ School of Medicine (Lake Success, NY). Thereafter, she completed a Surgical Pathology fellowship and a Cytopathology fellowship at the Hospital of the University of Pennsylvania (Philadelphia, PA). Before joining Weill Cornell Medicine, Dr. Goyal served as Staff Pathologist in the Department of Pathology at Cleveland Clinic (Cleveland, OH). She is currently a member of the College of American Pathologists' Cytopathology Committee, the Enduring Consensus Cervical Cancer Screening and Management Guidelines Committee, and the American Society of Cytopathology Clinical Practice Committee. She serves on the Editorial Boards of the Journal of American Society of Cytopathology and Diagnostic Cytopathology. Her research focuses on the refinement of diagnostic criteria and quality assurance in gynecologic cytopathology and the application of ancillary studies in the detection of HPV-associated lesions of the female lower genital tract. She has authored several publications and book chapters and has presented at various national/international meetings.

All attendees are welcome to join the reception following The Papanicolaou Lecture.

Welcome Reception Artist
Monday, June 17 | 6:30 PM - 8:30 PM
Dan Thompson



Dan Thompson will demonstrate a portrait drawing from direct observation, emphasizing head and facial anatomy. He will draw in graphite pencil from a live model.

Biography:

Dan Thompson has been awarded multiple grants and prestigious awards, including Best of Show in the American Society of Portrait Artist's International Portrait Competition at the Metropolitan Museum of Art in New York. Thompson has co-founded two schools in Manhattan: the Grand Central Academy of Art (2006) and the Janus Collaborative School of Art (2008). Dan Thompson has been selected an ARC Living Master Artist. He has exhibited in public and private collections throughout the world, including the Art Gallery of Ontario, the University of Pennsylvania, the Corcoran Gallery of Art, the John Noble Museum, the National Arts Club, the United States Capitol and Beijing's World Art Museum.

The Protected Airway Post Graduate Course

June 21, 2024

(Pre-Registration Required, Separate from Conference Attendee Registration)

Dr. Jonathan St. George MD, from Weill Cornell Medicine in New York, NY, will be walking participants through the Protected Airway Collaborative learning course. In the world of emergency airway, there's an important difference between knowing the path and walking the path. PAC was created around a single simple idea: that any airway knowledge is useless if it can't be successfully translated into action during the stressful, and time-critical moments when it matters most. What you learn should function in the real world.

See more on the Protected Airway Collaborative website here:
<https://theprotectedairway.com/welcome-to-the-aaca-post-graduate-course/>

Schedule of Events Location: Weill Cornell Medicine

7:30 AM	Check-In for Course
8:00 AM	Course Begins
11:00 AM	Course Adjourns

Dr. Jonathan St. George, MD



Biography:

Emergency physician & educator – Director of the Protected Airway Collaborative.

The creator of the Protected Airway Collaborative with 10+ years experience in developing innovative learning delivery systems in medical education that meets learners where they live. PAC provides high quality airway training by integrating both the digital and physical space. An assistant professor in emergency medicine at Weill Cornell with extensive clinical experience in urban, rural, academic, community international, telemedicine, and disaster response medicine.

Creator & Director the Protected Airway Collaborative
Assistant Professor @Weill Cornell
Faculty Center for Virtual Care
Director the Digital Media Lab

Committee Meeting Descriptions

(Open to all – not restricted to members of the committee | Breakfast and lunch meal tickets were pre-purchased options, only those who pre-purchased will be allowed into the meal line. All attendees are welcome to join the meetings.)

Career Development Committee (CDC) Meeting and Anatomy Career Connections Breakfast

Tuesday, June 18th from 7:30 am – 9:00 am

Open to All Attendees

The CDC will host a welcoming “Anatomy Career Connections” breakfast on Tuesday, June 18th from 7:30-9:00am for all members, regardless of the stage of their career, to foster connections among junior and senior anatomists. The format of the breakfast will consist of several seasoned anatomy ‘hosts’ who will engage in conversation with a group of 8-10 attendees. Additionally, the hosts will facilitate introductions among attendees throughout the conference to foster connections between anatomists with similar backgrounds and needs. We will also nominate and elect a new Career Development Committee Member at this breakfast session. All are welcome to join.

Anatomical Services Committee (ASC) Breakfast Meeting

Wednesday, June 19th from 7:30 am – 9:00 am

Open to All Attendees

Breakfast Meeting, Wednesday, June 19, from 7:30a to 9:00a. If you missed meeting our members at the opening reception, please join us for our breakfast meeting. Our meeting is filled with experts on all aspects of body donation, from technical preparations to ethics, policies, and more. In addition, your colleagues bring years of experience, making our meeting a great place to find the information you need. This year, we will host table discussions that will lead to a q&a portion with a panel of experts in donor preparation. Come with questions and be excited for conversation on the ins and outs of donor preparation, donor usage and the good and bad that can occur in the lab. Active AACA members present at will also elect a new committee member who will serve for three years. Please submit your nomination to any ASC member in advance. Self-nominations are welcome. Come to the ASC meeting to listen or to be part of the conversation by sharing your experiences. We look forward to seeing you there.

Educational Affairs Committee (EAC) Lunch Meeting

Wednesday, June 19th from 12:00 pm – 1:30 pm

Open to All Attendees

Meeting Overview:

- Nomination and election of new members.
- A brief poll to attendees about their use of technology in anatomy education.
- Attendees will discuss the questions and elect a representative to introduce their suggestions.
- General discussion time.
- Conclusion by announcing the new members’ names.

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Diversity, Equity, and Inclusion Committee (DEIC) Lunch Meeting
Tuesday, June 18th from 12:00 pm - 1:30 pm
Open to All Attendees

This lunch meeting of the Diversity, Equity, and Inclusion Committee within the American Association of Clinical Anatomists is an opportunity for members of the committee to interact and network with one another as well as other members of the AACA. All AACA members are invited to attend and share lunch and professional and personal stories with one another. The first part of the meeting will feature business in which new members will be elected. During this portion of the meeting, the mission and purpose of the committee will be emphasized. The next part of the session will include a summary of the takeaways from the Spring CART session in April titled “Beyond Binary: Sex and Gender Affirming Language Considerations for Clinical Settings, Anatomy Learning Environments, and Body Donation Programs.” This portion will also provide an opportunity for us to advertise our symposium speaker, Dr. Marci Bower, President of the World Professional Association for Transgender Health (WPATH). In addition, this session will include a solicitation for volunteers who wish to contribute to the DEIC Blog to which all AACA members have subscription access. Finally, the session will conclude with a brief report of the past and ongoing activities within the committee and with facilitated discussion inviting all attendees to share their own stories and experiences with sex and gender differences among students and faculty and their impacts.

Session Objectives:

Attendees will be able to...

Participate in the election of new members.

Describe the main takeaways from the DEIC Spring CART session held in April.

Discuss the DEIC symposium speaker.

Describe and participate in the DEIC Blog page.

Explain the past and ongoing activities of the DEIC.

Engage in sharing stories and experiences with sex and gender differences among students and faculty and their impacts.

Brand Promotion & Outreach Committee (BPOC) Lunch Meeting
Thursday, June 20th from 11:45 am – 1:15 pm
Open to All Attendees

Join us for the BPOC lunch session to discuss student recruitment, engagement, and retention within AACA. This session will highlight patterns of student engagement over the last decade and compare to peer organizations. As a group, we will have conversations about ways to engage and support student involvement in AACA. Diving into tactics to increase student engagement at multiple levels will provide direction for organizational growth.

Committee Symposia Descriptions

(Open to all – not restricted to members of the committee)

Anatomical Services Committee (ASC) Symposium

Tuesday, June 18th from 1:45 pm – 3:00 pm

Open to All Attendees

“The Conundrum of Corpses: The Ethics of the Post-Mortem Gaze in the 21st Century”

This presentation will examine the history of medical museums, the origins and intent of medical collecting, the issues and ethics surrounding consent, 21st century medical collections (the Living Donor Program at the Mütter Museum), the direct and indirect impacts of the display and use of medical collections, the intersection of death and health, and asking the tough question - where do we go from here?



Anna N. Dhody, MFS

Anna N. Dhody, MFS is the Founder and Executive Director of the Dhody Research Institute. She was previously the Gretchen Worden Curatorial Chair, Mütter Museum and Director, Mütter Research Institute of The College of Physicians of Philadelphia. She received her BA in archaeology from Boston University, Masters in Forensic Science from The George Washington University. A forensic anthropologist, Ms. Dhody previously served as an osteologist at Harvard University’s Peabody Museum of Archaeology and Ethnology and worked with the United Nations Development Programme and the Public Ministry of Peru to identify some of the estimated 69,000 “Desaparecidos” victims of state terrorism. Ms. Dhody is a member of the Vidocq Society, a Consulting Scholar at The University of Pennsylvania’s Museum of Archaeology and Anthropology and was appointed a Fulbright Specialist in 2023 in museum studies and physical anthropology.

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Educational Affairs Committee (EAC) Symposium
Thursday, June 20, 2024 from 9:15 - 10:30 am
Open to All Attendees

“Integration of Innovation Educational Technologies in Anatomy Teaching”

MD, PhD, FASA. Clinical Professor. Director, Stanford Chariot Program. Director, Pediatric Anesthesiology Fellowship Program. Department of Anesthesiology, Perioperative, and Pain Medicine. Division of Pediatric Anesthesiology. Lucile Packard Children’s Hospital Stanford. Stanford University School of Medicine.



Tom Caruso

Dr. Caruso, MD, PhD, FASA is a Clinical Professor of Pediatric Anesthesiology at Lucile Packard Children’s Hospital Stanford. He is the Director of the Stanford Chariot Program, which aims to reduce pediatric patients’ anxiety, encourage rehabilitation, and improve education with immersive technologies, including mixed spatial and virtual reality. Dr. Caruso has published and presented internationally on the utilization of virtual reality in the hospital setting. Software developed by the Chariot Program can be found in hundreds of hospitals and their customized immersive technology solutions are widely used by researchers in the field. He is also founder and board chair of Invincikids, a global non-profit that distributes immersive technologies to pediatric patients around the world.

Professor Caruso’s presentation will be followed by three mini presentations on the application of technology in anatomy teaching by:

- Dr. Ameer Raouf: Kaiser Permanente School of Medicine, California
- Dr. Priti Mishall: Albert Einstein College of Medicine, New York
- Dr. Rosaysela Santos: Kaiser Permanente School of Medicine, California

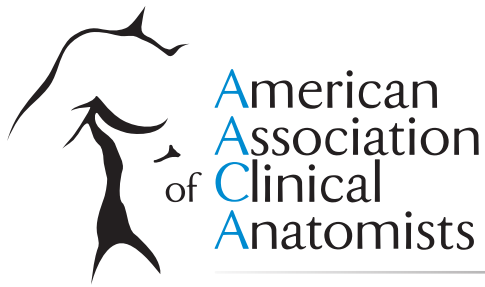
Diversity, Equity, And Inclusion Committee Symposium
Thursday, June 20th, 2024 from 1:30 pm – 2:45 pm
Open to All Attendees

***“Gender Affirming Surgery:
More than Anatomical Correctness”***



Marci Bowers, M.D.

Marci Bowers, M.D. of Burlingame, California, is recognized as a pioneer in the field of Gender Affirming Surgery. She is the first surgeon with transgender history and first woman to perform Gender Affirming Genital surgeries worldwide. Dr. Bowers is a pelvic and gynecologic surgeon with nearly 34 years' experience and has performed more than 2,400 primary AMAB Gender Affirming Vaginoplasties and more than 4,400 Gender Affirming Surgeries. Dr. Bowers has established transgender surgical education programs at Sheba Hospital in Tel Aviv (2014), Mt. Sinai in New York (2016), Denver Health (2018), the University of Toronto (2019), Northwell Health (2020) and USC/Children's Hospital Los Angeles. Dr. Bowers is President of the World Professional Association for Transgender Health (WPATH) and serves on the Trevor Project Board of Directors after prior terms with GLAAD and the Transgender Law Center.



American
Association
of Clinical
Anatomists

Annual Business Meeting Agenda

Thursday, June 20th, 2024
New York, New York

PO Box 2945
LaGrange, Ga 30241
Ph: 706-298-0287

www.clinical-anatomy.org

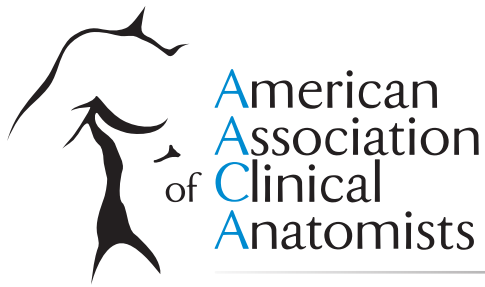
CALL TO ORDER: 3:00 pm

Approval of Minutes of 2023 Annual Business Meeting (ABM) and the 2024 ABM Agenda

1. **President's Report** – R. Shane Tubbs – **10 minutes**
 - a. 2024 Election Results
 - b. 2025 Election – Positions open to the AACA Membership in 2025
 - i. President Elect
 - ii. Treasurer
 - iii. Special Councilor – Clinical
 - iv. Councilor-at-Large (2)
 - c. Presidential Committee Appointments¹
 - d. State of the Association
2. **Treasurer's Report** – Mathangi Rajaram-Gilkes – **5 minutes**
3. **Membership Committee Report** – R. Shane Tubbs – **5 minutes**
 - a. Remembrance of Deceased Members – Mo Khalil – **1 minute**
4. **Journal Committee Report** – R. Shane Tubbs – **2 minutes**
 - a. Report of Editor-in-Chief of *Clinical Anatomy* – R. Shane Tubbs – **7 minutes**
5. **Meeting Organization & Program Planning Committee Report** – Jennifer Burgoon – 10 minutes
 - a. Report of 2024 Annual Meeting Committee
 - b. Future Meetings:
 - i. 2025 AACA Annual Meeting: Hyatt Regency Bellevue, Bellevue, WA (suburb of Seattle)
 - ii. 2026 AACA Annual Meeting: Mayo Clinic, Rochester, MN
 - iii. 2027 AACA Annual Meeting: Texas Tech University Health Sciences Center, Lubbock, TX
6. **Annual AACA Awards** – R. Shane Tubbs – **5 minutes**
 - a. Honored Member Award 2024 – Michael Nolan
 - b. R. Benton Adkins, Jr. Distinguished Service Award 2024 – Ameer Raouf
7. **Old Business** – **2 minutes**
8. **New Business** – **3 minutes**

ADJOURNMENT: 4:30 pm

¹ The Special Interest Group (SIG) Committees (Brand Promotion and Outreach, Educational Affairs, Career Development, Clinical Anatomical Terminology, and Anatomical Services) elects members at their committee meetings.



Minutes from 2023 Annual Business Meeting

Wednesday, July 12th, 2023
Orlando, Florida

PO Box 2945
LaGrange, Ga 30241
Ph: 706-298-0287

www.clinical-anatomy.org

CALL TO ORDER: 3:01 pm

1. Approval of Minutes of 2022 Annual Business Meeting (ABM) and 2023 ABM Agenda

- a. No corrections – minutes are approved for both

2. President's Report (Tom Gest) ----- 3:01 PM

- a. Delivered by Shane Tubbs
- b. 2023 Election Results
 - i. President Elect – Anthony D'Antoni
 - ii. Association Secretary – Mohammed Khalil
 - iii. Councilor-at-Large – Mahindra Anand Kumar
 - iv. Councilor-at-Large – Kazzara Raeburn
 - v. Special Councilor-Allied Health – Yoko Tabira
- c. 2024 Election – Positions open to the AACA Membership in 2024
 - i. Program Secretary (1)
 - ii. Special Councilor – Anatomical Services (1)
 - iii. Councilors-at-Large (2)
- d. Special Interest Group Committee Updates
 - i. Anatomical Services Committee
 - (1) Presidential Appointees
 - (a) 2021-2024: Amberly Reynolds
 - (b) 2022-2025: Evan Goldman
 - (c) 2023-2026: Matthew McCracken
 - (2) Members Elected at Annual SIG Meeting of Committee
 - (a) 2021-2024: Amanda Mittelstadt
 - (b) 2022-2025: Aron Davis
 - (c) 2023-2026: Sarah Garnaat
 - ii. Brand, Promotion and Outreach Committee
 - (1) Presidential Appointees
 - (a) 2021-2024: Soo Kim
 - (b) 2022-2025: Nena Lundgreen
 - (c) 2023-2026: Mathangi Rajaram-Gilkes
 - (2) Members Elected at Annual SIG Meeting of Committee
 - (a) 2021-2024: Jessica Immonen
 - (b) 2021-2024: Kelsey Picha
 - (c) 2021-2024: Saskia Richter
 - iii. Career Development Committee
 - (1) Presidential Appointees
 - (a) 2021-2024: Rekha Kar
 - (b) 2022-2025: Priti Mishall
 - (c) 2023-20256: Ewardl Marshall

continued on next page

- (2) Members Elected at Annual SIG Meeting of Committee
 - (a) 2021-2024: Amanda Troy
 - (b) 2022-2025: Gurvinder Kaur
 - (c) 2023-2026: Sharlene Harris
- iv. Clinical Anatomical Terminology Committee
 - (1) Presidential Appointees
 - (a) 2021-2024: Mahindra Anand
 - (b) 2021-2024: Stephen Bordes
 - (c) 2022-2025: Brad Martin
 - (d) 2022-2025: Efrain Miranda
 - (e) 2023-2026: Peter Ward
 - (f) 2023-2026: Alan Detton
 - (2) Members Elected at Annual SIG Meeting of Committee
 - (a) 2021-2024: Amy Lovejoy Mork
 - (b) 2021-2024: Noel T. Boaz
 - (c) 2022-2025: Sasha Lake
 - (d) 2022-2025: Katherine Brakora
 - (e) 2023-2026: Sarah Tilden
 - (f) 2023-2026: Chernet Tessama
- v. Educational Affairs Committee
 - (1) Presidential Appointees
 - (a) 2021-2024: Dave Brzezinski
 - (b) 2022-2025: Jon Jackson
 - (c) 2023-2026: Mitesh Dave
 - (2) Members Elected at Annual SIG Meeting of Committee
 - (a) 2021-2024: Ameer Raof
 - (b) 2022-2025: Eiman Abdel Meguid
 - (c) 2023-2026: T'Kayhlia Cornish
- vi. Ad Hoc Diversity, Equity, and Inclusion Committee
 - (1) Edgar R. Meyer, Chair
 - (2) Chelsea Lohman Bonfiglio
 - (3) Amanda Collins
 - (4) Haley L. Nation
 - (5) Jonathan J. Wisco
 - (6) Sarah Greene
- 3. Treasurer's Report** (Anthony D'Antoni) ----- 3:07 PM
 - a. Delivered by Jennifer Whitlow Walls
 - a. Summary of Accounts
 - b. Growth over time
 - c. Status of accounts: total assets \$1,050,338
 - i. This will decrease once meeting costs have been paid
 - ii. Annual meetings – Historical review
 - (1) Projected to lose about \$64,680 this year
 - (2) This is largely due to increase costs related to food and technology
 - iii. Regional meetings –
 - (1) Working on adding more regional meetings
 - (2) Generally have small net income
 - iv. Other income
 - (1) Membership dues, expect to meet over 500 this year
 - (a) Encouraged membership to encourage previous members in grace period to join
 - (2) Journal budget – on target for this year

continued on next page

d. Current issues

- i. Membership
 - (1) Possibly reach out to previous members/members in grace period
- ii. Location of annual meeting, virtual Council meetings, regional meetings, vendors/sponsorship
- iii. Virtual Council meetings
- iv. Vendors/Sponsorship
 - (1) We can work on increasing sponsorship, which decreased during COVID
- v. Anticipate that we will break even by the end of the year
- vi. Thanks to members of Financial Affairs Committee
 - (1) Will ensure regular meetings of FAC in the future

4. Membership Committee Report (Shane Tubbs) ----- 3:14 PM

- a. Reviewed Membership Committee
- b. Reviewed membership types
- c. Reviewed membership dues structure
 - i. Discussed possibility of institutional membership in addition to individual membership
- d. Remembrance of Deceased Members (Sarah Greene)

5. State of the Journal (Shane Tubbs) ----- 3:17 PM

- a. Reviewed editors and structure
- b. Reviewed trend of article views – continued increase
- c. Reviewed most viewed articles in Clinical Anatomy (top 10)
- d. Reviewed country/region of submission
- e. Reviewed Impact Factor
 - i. Anatomy/Morphology category
 - ii. Have remained stable at about 2.4 over the past few years
 - iii. Reviewed comparison to other journals
 - (1) Now above Journal of Anatomy and Annals of Anatomy
 - iv. Reviewed articles that contributed to 2022 Impact Factor
 - (1) Education during COVID
 - (2) Teaching methods (three dimensional techniques)
 - (3) Standard statement for acknowledging donors in publications (by editors)
 - v. Reviewed journals that have cited Clinical Anatomy articles
 - vi. Reviewed upcoming articles of interest

6. Meeting Organization & Program Planning Committee Report (Jennifer Burgoon) -3:26 PM

- a. MOPP Committee Report
 - i. Continued work on customizing Planstone software
 - (1) A post-conference survey will be going out for feedback
 - ii. Improved submission guidelines, reviewer guidelines, and the post-conference survey
 - iii. Watched for IRB approval (when applicable)
 - iv. Developed the conference schedule
 - (1) Utilized abstract reviewer's ratings to select presentation format for presenters
 - (2) Members rated submitted ratings, which were utilized to determine platform, poster, or techfair
 - (a) When submitting abstracts, authors should indicate all formats that they are willing to present
 - (3) Changed Banquet to Awards Reception and Celebration
 - (4) Added Closing speaker, Parade of Committees, Ultrasound course
 - (5) Brought back the TechFair
 - v. Utilized abstract reviewer's rating to select finalists for certain awards
 - vi. Future conference planning

- b. Review of abstract submission statistics
 - i. 96 initial submissions, 35 late-breaking
 - (1) 63 publishable, 40 nonpublishable (late breaking)
 - ii. 289 registrants
- c. Thanks to Special Interest Committee Chairs
 - i. Anatomical Services: Amanda Mittelstadt
 - ii. Brand, Promotion, and Outreach: Soo Kim
 - iii. Career Development Committee: Amanda Troy
 - iv. Clinal Anatomy Terminology: Chelsea Lohman-Bonfiglio and Richard Tunstall
 - v. Educational Affairs Committee – Haley Nation
 - vi. Diversity Equity and Inclusion Committee – Edgar Meyer
- d. Thanks to Meeting Managers
 - i. Sarah Keim-Janssen (2021-2023)
 - ii. Amberly Reynolds (2022-2024)
 - iii. Brian MacPherson (2023-2025)
- e. Thanks to others
 - i. Evan Goldman – Ultrasound course
 - ii. Peter Ward – Trivia Night
- f. Thanks to Local Hosts
 - i. Jennifer Mark, Jacqueline Flores, Heather Hargreaves - 2023 (Orlando)
 - ii. Estomih Mtui & Anthony D’Antoni - 2024 (New York)
 - iii. R. Shane Tubbs & Joe Iwanaga - 2025 (Seattle)
- g. Thanks to ASG
 - i. Jennifer Whitlow
 - ii. Alex Waters
 - iii. Rhonda Freeman
- h. Future Meetings:
 - i. 2024 AACA Annual Meeting, June 17-21, New York, NY – Estomih Mtui & Anthony D’Antoni
 - (1) Meeting will be at Weill Cornell Medical School rather than hotel
 - (2) Dr. Ritwik Baidya gave presentation about New York meeting
 - (a) Postgraduate course – The Protected Airway by ED of Weil Cornell
 - ii. 2025 AACA Annual Meeting, June 16-19, Seattle, WA – R. Shane Tubbs & Joe Iwanaga
 - (1) Will be in Bellevue at a hotel
 - iii. 2026 AACA Annual Meeting, Virtual
 - iv. Other Future AACA Annual Meetings
 - v. If interested in hosting a conference (Regional or National) – please email ASG
- i. Post-Conference Survey
 - i. Please complete to help us improve future meetings

7. Committee Updates ----- 3:44 PM

- a. Bylaws Committee
- b. Nominating Committee
- c. Financial Affairs Committee
- d. Journal Committee
- e. Membership Committee

8. Old Business ----- 3:45 PM

9. New Business ----- 3:45 PM

- a. Currently abstracts accepted for publication are not being published in Clinical Anatomy – this should be addressed with Clinical Anatomy and Wiley
- b. There is concern about the 2026 meeting being virtual
- c. Discussion of creating institutional membership for AACA
- d. Proposal to add a student representative to Special Interest Committees
- e. These items will be brought to Council for discussion

10. Motion to Adjourn – Jon Jackson

- a. Second – Brion Benninger
- b. Motion has passed

ADJOURNMENT: 3:48 PM

2023 – 2024

AACA Council Members

Officers

President – R. Shane Tubbs, Ph.D.

President-Elect – Anthony V. D’Antoni, D.C., Ph.D.

Secretary – Mohammed K. Khalil, DVM, MEd, Ph.D.

Treasurer – Mathangi Rajaram-Gilkes, MBBS, M.Sc.

Past-President – Thomas R. Gest, Ph.D.

Program Secretary – Jennifer M. Burgoon, Ph.D.

Councilors

Kathleen Carol Bubb, MD

Joe Iwanaga, DDS, Ph.D.

Yoko Tabira, PT, Ph.D.

James Coey, MD

Koichi Watanabe, MD, Ph.D.

Nirusha Lachman, Ph.D.

Estomih P. Mtui, MD

Mahindra Kumar Anand, Ph.D.

Kazzara Raeburn, MD

Marios Loukas, MD, Ph.D.

Clinical Anatomy

The Official Journal of the American Association of Clinical Anatomists, and the British Association of Clinical Anatomists

Editor-in-Chief – R. Shane Tubbs

Editor Emeritus – Stephen W. Carmichael

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AACA Co-Editors – Anthony V. D’Antoni, Thomas R. Gest, Mohammad Khalil,
Marios Loukas, Susan Standring

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Assistant BACA Editor – Jenny Clancy

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me.clinicalanatomy@gmail.com

Production Editor – Reeni Sunder
sreeni@wiley.com

Committee Reports

Anatomical Services Committee
Ad hoc Diversity Inclusion and Equity Committee
Brand Promotion and Outreach Committee
Career Development Committee
Clinical Anatomical Terminology Committee
Educational Affairs Committee
Journal Committee
Listserv Admin Report
Membership Committee
Meeting Organization and Program Planning Committee
Nominating Committee
Bylaws Committee

Anatomical Services Committee (ASC) Report

The Anatomical Services Committee (ASC) represents academic and technical members of the Association who are active in the operations and administration of institutional whole-body donation programs. ASC functions to serve the AACA membership by developing symposia, special sessions, courses, and guidance documents and promoting technical and academic aspects of human anatomical tissue use in healthcare, university education, and research. In addition, the group advocates for the informed, ethical, and safe operation of body donation programs to support the human anatomical tissue requests of students, faculty, staff, and researchers who contribute to the advancement of medicine through education and research. Information about the ASC, including position statements, best practices, contact information, and links, can be accessed from the Association website: <http://clinical-anatomy.org/Committees>

During the 2023-2024 year, the ASC met regularly to identify key issues relevant to the operation of body donation programs, including current practices, compliance, preparations, ethics, public relations, and more which inform the discussion that will be facilitated during the annual breakfast meeting. Additionally, they worked to find a symposia speaker who could speak to the ethics of body donation and teaching the public. A statement of donor acknowledgement was created and provided to all those presenting at the conference, poster and platform, who used donor tissue in their research.

Presidential Appointees:

2021-2024: Amberly Reynolds, Rocky Vista University, areynolds@rvu.edu, Chair

2022-2025: Evan Goldman, Penn State College of Medicine, egoldman1@pennstatehealth.psu.edu

2023-2026: Matthew McCracken, mmccracken006@gmail.com

Elected Members:

2021-2024: Amanda Mittelstadt, University of North Carolina School of Medicine, amanda_mittelstadt@med.unc.edu

2022-2025: Aron Davis, University of California, Davis ardavis@ucdavis.edu

2023-2026: Sarah Garnaats, Michigan State University, garnaats@msu.edu

Ex Officio: James Coey, St. George's University, ASC Special Councilor, jcoey@sgu.edu

Opening Reception, Monday, June 17, from 6:30p to 8:30p Members of the ASC will be present at the reception to greet meeting attendees. Individuals interested in anatomical services are encouraged to join and seek out committee members to learn what we do and how to get involved.

continued on next page

Diversity, Equity, and Inclusion Committee (DEIC) Report

Members:

Edgar R. Meyer (Chair)	Thomas Gest	Sasha Lake
Yomi Afolabi	Somesree GhoshMitra	Haley L. Nation
T'Kayhlia Cornish	Sarah Green	Paul Neumann
Fakoya Adegbenro	Heba Labib	Jonathan J. Wisco

*Note: Chelsea Lohman Bonfiglio had to step down from serving on the committee due to other conflicting duties at her current institution.

Mission:

Created in 2020, the Ad-Hoc Diversity, Equity, and Inclusion Committee (DEIComm), committee is charged by the AACA with promoting and fostering a culture that values diversity, equity, and inclusion in clinical anatomy. The charges of this ad hoc committee are as follows:

1. Surveying and evaluating AACA membership, statements, and activities on issues affecting diversity, equity, and inclusion in the clinical anatomy profession and
2. Identifying gaps and making recommendations to:
 - a. Raise awareness and provide education on the importance of diversity and inclusion in the profession.
 - b. Promote outreach and mentorship.
 - c. Identify resources for training.
 - d. Support a forum for discussion on diversity and inclusion.

Summary of Past and Ongoing DEIComm Activities

The committee met monthly to discuss the needs of the membership, proposed budgets, awards, and future projects. Recurring weekly meeting continued for the third Wednesday of every month for May 2023, and there was no meeting held in June 2023. But a meeting prior to the annual meeting was held on the first Wednesday in July to finalize breakfast meeting details for the annual meeting. At the breakfast meeting at the most recent annual meeting, we acquired 8 new members interested in serving on the committee at the most recent annual meeting—one of whom is a student. One member had to step down from serving on the committee. The first meeting with the new members was held on August 2, 2023, at 2:00 p.m. CDT, and new recurring meeting times were established in an alternating fashion for the second Thursday and first Wednesday of every other month to accommodate the schedules of the larger member base. Meetings have been held every month except for January and February. The following bullet points outline the tasks accomplished during and/or after these meetings up until the current timepoint:

- We successfully facilitated the AACA DEIC CART webinar titled “Students’ Perceptions of DEI in Anatomy” on Wednesday, April 26, at noon Eastern Standard Time. This CART webinar featured a panel of anatomy students from diverse backgrounds in terms of their demographics, degree programs, and institutions. The student panelists were invited to respond to a set of guided questions inquiring about their perceptions of diversity, equity, and inclusion within their anatomy curricula, programs, schools, and institutions. And the discussion was followed by a Q&A session.
- We reviewed abstracts submitted for the Diversity, Equity, and Inclusion Student Award, for the 2023 AACA Annual Meeting, but we determined that no submissions were in line with the award description. This award description is now communicated to students who are registering for the meeting and submitting abstracts.
- We facilitated the DEIC breakfast meeting titled, “Lessons Learned from the Voices of Anatomy Students: An AACA DEIC CART Session Debrief,” on July 12, 2023, at the Annual Meeting, and we had a great attendance (full room). I as Chair shared takeaways from the April CART session, and Haley Nation shared data from DEI survey conducted at her institution with her students after she integrated DEI content into anatomy learning materials.

continued on next page

- A portion of the AACA Budget Request for 2024 was approved by the Council. \$1290 was approved. Money is budgeted to be used for one student and one regular attendee award for DEIC Award at 2024 Annual Meeting selected by DEI Committee. The award should consist of a one-year membership and registration to the conference.
 - \$120 Membership for Associate Member (student) electronic access + \$400 Student Member Registration for 2024 Annual Meeting = \$520 Total
 - \$170 Membership for Regular Member electronic access + \$600 Regular Member Registration for 2024 Annual Meeting = \$770 Total
- The committee finalized planning details for the AACA DEIC CART webinar session titled “Beyond Binary: Sex and Gender Affirming Language Considerations for Clinical Settings, Anatomy Learning Environments, and Body Donation Programs” and shared a description with goals/learning objectives for dissemination and advertisement. The full description can be read in **Appendix A**. The webinar will be held on April 24.
- The committee continues to post blogs featuring DEI themes pertinent to the day and/or month. They have been shared on the AACA DEIC Blog page and via social media platforms. The blog page can be viewed by visiting the following link, and posts can be made in response to blog entries and other members’ responses by logging in with your membership information.
- The committee has begun work on a Differences in Sex and Gender Terminology document that will become a collaborative project with other AACA committees.
- The committee is planning the DEIC lunch meeting for June 18.
- The committee is still searching for a speaker for the symposium on June 20 at the annual meeting. Lodging and travel for a speaker have been approved by the Council.

Future DEIComm Activities

The committee aims to complete the following tasks prior to or during the 2024 AACA Annual Meeting:

- Facilitate the AACA DEIC CART webinar titled “Students’ Perceptions of DEI in Anatomy” on Wednesday, April 26, at noon Eastern Standard Time.
- Review abstracts submitted for the Diversity, Equity, and Inclusion Student Award, judge their posters at the 2024 AACA Annual Meeting, and select an award recipient from the presenters.
- Facilitate the DEIC lunch meeting on June 18 at the Annual Meeting.
- Facilitate the DEIC symposium on June 20 at the Annual Meeting.
- The committee aims to have at least two new members appointed by the annual meeting.
- The committee aims to continue working on the Differences in Sex and Gender terminology document, adding additional experts into the discussion, such as members of the Transgender community and advocates for Transgender people.

The committee aims to complete the following tasks in the future beyond the 2024 AACA Annual Meeting:

- Review AACA membership diversity.
- Initiate and/or improve relations with other national and international professional societies.
- Create a repertoire of DEI resources for membership access.

Appendix A

Beyond Binary: Sex and Gender Affirming Language Considerations for Clinical Settings, Anatomy Learning Environments, and Body Donation Programs

This session will involve a guided discussion with four panelists with professional expertise and lived experiences of advocacy and promotion of inclusive environments for members of the LGBTQIA+ community, especially people who identify as Transgender or with other gender expansive identities. Panelists and attendees will be invited to engage in a conversation about fostering such inclusive environments among student, patient, and donor populations through the use of diverse, non-binary terminology.

After this session, attendees will be able to...

1. Identify the role(s) of anatomical educators in creating a more inclusive learning environment for transgender and gender-diverse learners in health professional education.
2. Reflect on the ways in which educators, students, and healthcare providers distinguish between sex and gender in their professional and personal settings.

3. Discuss practical steps for acknowledging sex and gender as diverse, non-binary concepts, for acknowledging sex diversity at different levels of biological variation, and for adopting a perspective of cultural humility in disclaiming inappropriate instances of using gendered language.
4. Provide examples of using specific anatomical terminology to discuss structures of the anterior thorax, pelvis, and perineum in a gender-affirming and non-binary sex framework for patients, students, and anatomical donors.
5. Describe the best practices for gathering information on donor sex and gender identity in willed body donation programs.

Ellis Locke, Ph.D.

Ellis (he/him) is a transgender anatomist and biological anthropologist. He received his Ph.D. in Evolutionary Anthropology from Arizona State University and is currently an Assistant Professor of Anatomy at the Idaho College of Osteopathic Medicine. His research focuses on the paleobiology and paleoecology of Miocene primates in Africa. In the realm of medical education, he is interested in inclusive teaching strategies for the anatomical sciences.

Julie Thompson, PA-C

Julie (she/her/hers) currently serves as both the Interim Associate Medical Director and the Medical Director of the Trans Health Program at Fenway Health. She is a primary care clinician leader who specializes in LGBTQIA+ health, high-resolution anoscopy, and is an HIV Specialist through the American Academy of HIV Medicine. As the Medical Director of Trans Health, Julie leads on-going education to support Fenway’s medical providers, and works interdepartmentally to ensure Fenway offers the highest quality care to trans and gender diverse communities and is welcome space for all patients and staff. Julie is on the faculty advisory board at the National LGBTQIA+ Health Education Center and is core faculty on TransECHO and TransLINE, providing trainings and consultative services for health care providers across the country. She also currently serves on the Board of Directors for the United States Professional Association of Transgender Health (USPATH).

Courtney Skaggs

Courtney (they/them/their) is the Patient Advocate in the Trans Health Program at Fenway Health, a Core Organizer of the direction action collective Intersex Awareness, and is the founder of the Intersex Research Coalition. They are from San Diego, California and have a Bachelor's of Science in Social Science Education and a Masters of Public Health degree. They are a researcher, activist, and organizer that experiences people-centered motivation. Courtney commits their efforts to movement building, promoting trans and intersex competent care, and creating equitable health systems. They enjoy hiking with their dog, park hangs with friends, and road trips in their free time.

Alexandra Arce, MD

Alexandra (she/her/hers) is a family medicine-trained physician from Fort Worth, Texas. A jack-of-all-trades by nature, she practices both as an emergency physician and a hospitalist out in rural communities, while also providing care at a methadone clinic part-time. Prior to this, she spent a year and a half as a general practitioner at Fenway Health in Boston, MA, focusing on LGBTQ+ primary care. Originally from Texas, Alexandra has a strong interest in bringing trans health and LGBTQ-care to rural areas. When she’s not pulling off 36-hour shifts, Alexandra is usually causing havoc with her Australian Shepherd, Paxi, or assembling a team for the week’s trivia night.

Brand Promotion & Outreach Committee (BPOC) Report

Soo Kim, University of Saskatchewan, Chair, soo.kim@usask.ca

Nena Mason, Dartmouth, nena.mason@dartmouth.edu

Jessica Immonen, University of Nevada Las Vegas, jessica.immonen@unlv.edu

Saskia Richter, University of Delaware, srichter@udel.edu

Kelsey Picha, A.T. Still University, kpicha@atsu.edu

Mathangi Rajaram Gilkes, Geisinger Commonwealth School of Medicine, mrajaramgilkes@geisinger.edu

Brand Promotion and Outreach Committee (BPOC) is responsible for the promotion, development, and maintenance of strategic initiatives of the Association with the overarching aims of expanding membership and increasing global reach. The BPOC is responsible for planning and overseeing fundraising efforts and associated travel awards for the Annual and Regional Meetings, managing the Association's social media presence, developing ongoing promotional materials and initiatives, and supporting outreach initiatives or opportunities.

For the upcoming annual meeting, the BPOC has curated an engaging lunch session centered around the pivotal theme of student involvement and the future growth trajectory of the AACA. Your participation in this session is highly encouraged! Additionally, we've prepared a selection of exciting SWAG items that will be available for purchase during the meeting. All proceeds from these sales will directly support student travel awards, underscoring our collective commitment to nurturing future talent within our organization. We kindly urge everyone to seize the opportunity to contribute by purchasing a polo shirt and a pair of socks, as supplies will be limited. Furthermore, as of January, the BPOC has taken on the role of editors for the AACA Newsletter. This presents a new avenue for our committee to actively promote upcoming events and celebrate the noteworthy achievements of our esteemed members.

continued on next page

Career Development Committee (CDC) Report

The Career Development Committee (CDC) supports the career growth and advancement of clinical anatomy knowledge for an individual at any stage of their career. The CDC encourages high quality anatomical research and educational scholarship through responsibilities such as judging student posters (Sandy C. Marks, Jr Award), platform presentations (Ralph Ger Award), and through hosting a CART session (Evolving Faces of Mentoring) and a breakfast (Anatomy Career Connections Breakfast & Business Meeting).

Over the past year, committee members met monthly to plan for the events throughout the year. The CDC CART session occurred on March 6th and considered the topic of mentoring. For the July annual meeting the CDC will host the Anatomy Career Connections Breakfast and CDC Business Meeting on Tuesday, June 18th. The purpose of this breakfast is to foster connections between members looking for guidance on career advancement. The discussion at breakfast will then turn to selection of a new committee member and announcement/thank you to the committee members cycling off.

If you are interested in serving, have a passion for mentoring, or have innovative ideas to promote career growth, please consider becoming a member of the CDC. We will be electing one new member at our breakfast meeting.

Presidential Appointees

2021-2024: Rekha Kar, karr@uthscsa.edu

2022-2025: Priti Mishall, priti.mishall@einsteinmed.edu

2023-2026: Ewarld Marshal, emarshall@sgu.edu

Members Elected at Annual SIG Meeting of Committee

2021-2024: Amanda Troy, troya2@duq.edu, Chair

2022-2025: Gurvinder Kaur, gurvinder.kaur@ttuhsc.edu

2023-2026: Jolene Harris, Jolene.harris@nwciova.edu

Clinical Anatomical Terminology (CAT) Committee Report

The Clinical Anatomical Terminology (CAT) Committee of the AACA studies the usage of anatomical terminology in biomedical sciences and in clinical practice. It strives to disseminate its findings through free web-based resources and through publications in the Association's journal, *Clinical Anatomy*. **Lacking a budget to create and maintain a terminology website, the CAT committee is exploring ways to partner with the Open Anatomy Project to enhance the web-based browser TA2Viewer (ta2viewer.openanatomy.org); Halle, Kikinis & Neumann, 2024, *Clin. Anat.*, doi/10.1002/ca.24162).**

In the past year, the CAT committee formed subcommittees to work on two projects.

The goal of the Fascia subcommittee (chaired by A. Detton) is to attempt to find a consensus definition and classification of fasciae because there is a wide chasm between the narrow definition in *Terminologia Anatomica* (FCAT, 1998) and the broader definition proposed by some members of the Fascia Research Society (e.g., Stecco and Schleip, 2016; Adstrum et al., 2017). As the project progresses in 2024-25, the subcommittee plans to seek input from a gradually expanded community – AACA members, other anatomists and then other scientists and clinicians interested in fascia.

A French TA2 subcommittee (chaired by G. Noel) was formed to produce a translation of the second edition of *Terminologia Anatomia* (TA2; FIPAT.library.dal.ca/TA2) as a resource for the francophone medical education programs in North America and the Caribbean, and other interested individuals and organizations. The subcommittee includes members from Canada (including émigrés from France, Switzerland, Belgium, Algeria and Morocco), U.S.A, Haiti and Mauritania. The goal is to present the completed translation for adoption by the AACA at the 2025 annual meeting. The plan for the French translation includes open access publication on the AACA website and incorporation into TA2viewer.

The CAT Committee is also responsible for hosting a breakfast or lunch at the annual AACA meeting and for organizing a Symposium in alternate years for the annual AACA meeting. The next CAT Symposium is scheduled for Seattle in 2025. At the 2024 meeting, the CAT committee will host a breakfast during which activities of the committee will be presented, two new members-at-large will be elected, and the popular anatomy terminology trivia contest will be held. The quiz is being prepared by a subcommittee chaired by N. Boaz.

Councilor, ex officio:

2023-2025: Mahindra Anand (manandk@hotmail.com)

Presidential Appointees

2021-2024: Alexandra Wink (alexandra.wink@umassmed.edu)

2021-2024: Geoffroy Noel (gnoel@health.ucsd.edu)

2023-2025: Paul E. Neumann (pneumann@dal.ca); **Chair**

2022-2025: Michael W. Halle (mhalle@bwh.harvard.edu)

2023-2026: Peter Ward (pward@osteo.wvsom.edu); **Secretary**

2023-2026: Alan J. Detton (ajd2216@cumc.columbia.edu); **Secretary**

continued on next page

Members-at-Large

2021-2024: Anthony Weinhaus (weinh001@umn.edu)

2021-2024: Noel T. Boaz (noeltboaz@integrativemedsci.org); **Vice Chair**

2022-2025: Sasha Lake (slake1@sgu.edu)

2022-2025: Katherine Brakora (kbrakora@tamu.edu)

2023-2026: Sarah Tilden (tildensa@msu.edu)

2023-2026: Chernet Tessema (chernet.tessema@med.und.edu)

Educational Affairs Committee (EAC) Report

Purpose of Committee:

The Educational Affairs Committee (EAC) shall promote the teaching of clinical anatomy, track national and international curricular trends and changes, and develop educational initiatives that will benefit the Association's members, health care professionals, the education community, and the public. The Committee disseminates data and recommendations for best practices for all aspects of anatomical education as it relates to clinical practice. The Committee shall plan and implement the Educational Affairs Symposium when scheduled by the Meeting Oversight and Program Planning Committee. The Committee shall consist of six (6) members, each serving a three (3) year term. The President-Elect shall appoint one (1) member in the second year of his/her term, and the President shall appoint one (1) member in the first year of his/her term. One (1) member shall be nominated and elected by the Active Members in attendance at its annual open meeting.

During the 2023-2024 monthly EAC meetings, discussions focused on a variety of topics, including:

- The extent of application of technology in anatomy education.
- Assessing impact of integrating technology on anatomy education.
- The importance of offering a repository of anatomy educational resources to members at large.

EAC Symposium-scheduled on June 20th, 2024:

Committee members chose to focus on assessing the integration of technology in anatomy education. The title for a symposium for the upcoming AACA meeting in NY will be: "Integration of Innovative Educational Technologies in Anatomy Teaching". Also, members agreed to invite Thomas Caruso, MD, PhD, a distinguished anesthesiologist at Stanford University, California who has outstanding research work on the applications of technology in education. Dr. Caruso agreed to present for the EAC symposium. Related logistical preparations have all been processed with the help of the AACA administrative support. The presentation will be followed by three short slide demos by members on the specific application of educational technology in anatomy education.

EAC Lunch Session scheduled on June 19th, 2024:

During the 2024 AACA conference, EAC will host a lunch meeting. During this meeting we will request attendees to nominate and elect new members followed by a brief presentation with poll/everwhere questions to assess the extent of technology use in education. A list of polling questions is attached below. Attendee at each table will be asked to discuss the questions and report to all after about 20-30 minutes.

At the end of the meeting, names of the new members will be announced.

EAC Meeting Minutes:

<https://drive.google.com/drive/folders/1q6NPtBE9ghLsouOR76SX2BtVBO5RVGc-?ths=true>

EAC Members:

Presidential Appointees

2021-2024: Dave Brzezinski

2022-2025: Jon Jackson

2023-2026: Mitesh Dave

Members Elected at Annual SIG Meeting of Committee

2021-2024: Ameer Raof, Chair

2022-2025: Eiman Abdel Meguid

2023-2026: T'Kayhlia Cornish

Journal Committee Report

Committee Members: Marios Loukas, Anthony D'Antoni, Tom Gest, Sari Friedman (Wiley editor), Phil Adds (Editor BACA), Shane Tubbs (Editor-in-Chief), and Kazzara Raeburn (Presidential Appointee).

The Journal has continued to thrive this year with the most submissions in our history. The Journal continues to publish high quality articles from prestigious institutions from around the world. Our articles continue to have large numbers of downloads and citations. Please consider submitting your best work to the Journal and continue to follow us online, in print, or on your mobile device with the Clinical Anatomy app for Android or iPhone users.

Listserv Admin Report

AACA's Education Issues Listserv was moved from the mail server at Einstein to being hosted on Google Groups in February of 2016. There are currently 1,129 subscribers to AACA's Listserv. From May 1, 2023 to May 1, 2024 there were 16 subjects posted. To the right of this report is a table of those posts that received the most responses.

AACA Education List

Total Subscribers (as of 5/1/24) = 1129

May 2022 – May 2023 Monthly Email Activity

May '23 = 3

June '23 = 1

July '23 = 0

August '23 = 0

September '23 = 2

October '23 = 2

November '23 = 1

December '23 = 0

January '24 = 0

February '24 = 0

March '24 = 6

April 1, '24 = 1

Total Emails = 16

continued on next page

Membership Committee Report

President-Elect –
Antony D’Antoni

Past President –
Thomas Gest

(2022 – 2024) Presidential
Appointee – Dolgor Baatar

(2023 – 2025) Presidential
Appointee –
Martha Johnson Gdowski

The membership committee
is pleased to state that
229 new members have
joined the AACA from May
11, 2023, to April 29, 2024.
The total number of active
members in the association
is 535.

New AACA Members:

AFFILIATE

Stephanie Woodley

ASSOCIATE POST-DOC ELECTRONIC

Alshaheed Nasraldin
Abdelhabeeb

Haitham Abdelrazek

Dong-ho Kim

Martin Klein

Uma Pandalai

ASSOCIATE ELECTRONIC

Kriti Agrawal

Abraham Alatorre

Joseph Anders

Madison Bachler

Mariah Bartz

Gabriella Battiston

Gabriel Benjamen

Iman Bouchelkia

Sophia Brown

Cory Buenting Gritton

Alison Buseck

Alexander Catoya

Melissa Cencetti

Elysia Chau

Justin Chen

Si-ah Choi

Angel Cleare

Bradley Collins

Mason Comes

Erinn Conlin

Catherine Curren

Carsyn Dykes

Hicham El Hor

Maire Fox

Lindsay Gallagher

Kara-Lyn Harrison

Alexander Ho

Ali Hosseinzadeh

Hyewon Hu

Najah Hussain

Chloe Hutchison

Deanna Irvin

Hannah Janecek

Ihab Jawad

Yuktesh Kalidindi

Sravika Kayithi

Trudy Kim

Yuyoung Kim

Rylee King

Elizabeth Kramer

Jordan Kuhlman

Megan Laing

Alexa Lauinger

Kyu-Lim Lee

Diana Lee

Cora Lyon

Chloe Maye

Jocelynn McGee

Liam McLoughlin

Lanese Medeiros De
Figueiredo

Max Miller

Taylor Moglia

Nitin Namburi

Gretchen Nemmers

Anh Nguyen

Cynthia Nguyen

Willem Northcut

Emily Otken

Shaan Patker

Brittany Puebla

Anthony Rahawi

Allyson Ripley

Gabriella Roofeh

Kelly Schaeffer

Andrew Schafer

Mark Shacker

Trey Shupp

Krishna Singh

Allison Smith

Cameron Smith

Matthew Sparling

Swathi Sridhar

William Srinivasan

Nicole Starke

Alec Steever

Gillian Summers

Minah Tariq

Nicholas Tchekryguin

Udit Thawani

Jacob Tiell

Anthony Tigano

Logan Tlam

Peter Trinh

Alexandra Tucker

Joanne Turner

Jessica Williams

Christine Yoon

Jillian Zalunardo

Alexis Zavitsky

REGULAR ELECTRONIC

Abduljabar Yasin Alhubaity

Hosne Ara

Vaclav Baca

Pugazhandhi

Bakthavatchalam

Jessica Bergden

Chandana Bhargavi

Anand Bhatia

Emily Bradshaw

Manuel Cevallos

Beom Sun Chung

Janine Correia

Maria Csobonyeiova

Daniel Daly

Max Dragan

Hashim Elmshiti

Mo Entezampour

Chinedu Enwerem

Guilherme Fonseca

Bonny Ford

Kathleen Galloway

Jatin Goda

Mercedes Gutierrez

Robert Hage

YUTO HAIKATA

Michael Halle

Eric Hallquist

Haider Hilal

Lyon Hough

Maclanie Houle

Fraser Houston

Lynne Hughes

Shelley Hunter

Maxwell Janczak

Unaiza Jawad

Mickael Antoine Joseph

Teresa Joy

Naveen Babu Kandavalli

Les Keniston

Narayana Kilarkaje

ChungYoh Kim

Tyler Krings

Anand Kulkarni

Terri Lake

Bobbie Leeper

Emma Lesser

Lindsey Liggan

Abhilasha Maharshi

Eward Marshall

Spencer Mattingly

continued on next page

Carolyn Meyer
 Robin Michaels
 Robert Minkes
 Kachina Morgan
 Zeinab Nassrallah
 Vincent Nerone
 Okechukwu Joseph
 Nkwocha
 Geoffroy Noel
 Henry Aduomare Okodaso
 Bayan Rajamanar
 Anna Ricci
 Sherese Richards
 Jeffrey Rot
 Yolanda Salinas-Alvarez
 Rarinthorn Samrid
 Diego Santiago
 Rosaysela Santos
 James Smiley
 Ayobosipo Sotunde
 Rebecca Sprouse
 Karen Stevens

Joshua Sun
 Yun Tan
 Alex Taylor
 Kristna Thompson
 Zach Throckmorton
 Sarika Tigga
 Casey Tilden
 Tamar Turmanidze
 Ranganath Vallabhajosyula
 Bruce Wainman
 Ron Walser
 Katherine Whitcome
 Nicole Yates
 Fatih Yazar
 Shayla Yoachim
 Caitlin Yoakum
 Natalie Yoshioka
 Mina Zeroual
 Chi Zhang
 Jing Zhao

REGULAR – PRINT
 Ian George
 Marius Ifrim
 Jonathan Millard
 Jatin Kumar Sharma
 Elizabeth Whitney
 Taylor Wyatt
 Jacqueline Flores-Otero
 James Yaggie

REGULAR (ANATOMICAL SERVICES) – ELECTRONIC
 Abayomi G. (Yomi) Afolabi
 Ahmed Alassal
 Srinivas Bharadwaj
 Courtney Brendal
 John Clark
 Patrick Frank
 Charles Fulton
 Ali Jalali
 Jennifer Kinder
 Sherrie LaFrance-Hale

Avelin Malyango
 Linden Pederson
 Juliet Rogers
 Ashleigh Skaalen
 Laine Skadsem
 Sivakami Thiagarajan
 Ahlberg Timothy
 Amanda Wilson

REGULAR (ANATOMICAL SERVICES) – PRINT
 Amanda Collins
 Michael Gregory
 Matthew McCracken
 Anthony Pappas

Meeting Organization & Program Planning (MOPP) Committee Annual Report, 2023-2024

Members:

Special Interest Committees

Anatomical Services Committee (ASC), Chair – Amberly Reynolds
 Brand Promotion and Outreach Committee (BPOC) – Soo Kim
 Career Development Committee (CDC), Chair – Amanda Troy
 Clinical Anatomical Terminology Committee (CAT), Chair – Paul Neumann
 Educational Affairs Committee (EAC), Chair – Ameer Raouf

Meeting Managers (Formerly Known as Annual Meeting Committee Co-Chairs)

Amberly Reynolds 2022-2024
 Brian MacPherson 2023-2025
 Adam Kolatorowicz 2024-2026

Local Hosts

Estomih Mtui & Anthony D’Antoni – 2024
 R. Shane Tubbs & Joe Iwanaga – 2025
 Nirusha Lachman & Jonathan Torrens-Burton – 2026
 Kerry Gilbert & Keith Bishop – 2027

ASG Representatives (Contracted Professional Organization Management Company)

Jennifer Whitlow, Executive Director
Rhonda Freeman, Meeting Specialist
Grace Foster, Program Coordinator

Executive Committee

R. Shane Tubbs, President
Anthony D'Antoni, President-Elect
Thomas Gest, Past President
Mathangi Rajaram-Gilkes, Treasurer
Mohammed Khalil, Association Secretary
Jennifer Burgoon, Program Secretary & MOPP Chair

Non-Voting Members

Diversity, Equity, and Inclusion (Special Interest) Committee (DEIC), Chair – Edgar Meyer
2024 Special Event (Trivia Night) Coordinator – Peter Ward

This report is being filed on April 30, 2024. The information contained herein is the most accurate available as of this date. I am completing the third year of my 3-year term as Program Secretary, after serving a previous 3-year term as Program Secretary and a 2-year term as a Meeting Manager.

During the 2023-2024 year, the Meeting Organization and Program Planning (MOPP) Committee has been working diligently to bring you an in-person annual meeting at Weill Cornell Medicine in New York, New York from June 17-21, 2024. Planning began immediately following the 2023 Orlando Annual Meeting by a thorough review of the results of the post-conference survey. During the year, the MOPP Committee held Zoom meetings once a month. This year we continued to welcome the Chair of the Diversity, Equity, and Inclusion (DEI) Special Interest Committee (i.e., Edgar Meyer), as well as one 2024 Special Event Coordinator (i.e., Peter Ward), to the MOPP meetings to assist with conference planning and internal communication. Also involved with MOPP were the two local hosts for the 2024 Annual Meeting, specifically Estomih Mtui and Anthony D'Antoni.

The 2024 AACA Annual Meeting and the program you are reading are the direct result of the tireless effort of the MOPP Committee and through the exceptional professional support of ASG. Special thanks to Jennifer Whitlow, Rhonda Freeman, Grace Foster, Amberly Reynolds, Brian MacPherson, Adam Kolatorowicz, Estomih Mtui, and Anthony D'Antoni, whose work behind the scenes on behalf of the MOPP Committee has made the 2024 AACA Annual Meeting possible.

This year's meeting is certainly an energizing experience and one that we hope all attendees will enjoy. We have brought back many positive aspects of the 2023 Annual Meeting. For example, the TechFair has returned with eight (8) presenters and with its valuable hands-on activities. Next, all member presentations (i.e., platform, TechFair, and poster) will still be available to conference attendees in the virtual setting (i.e., Planstone), a great benefit to those judging posters and a perfect way to preserve the exceptional work of our members. As in previous years, attendees will be able to provide feedback for all these presentations via Planstone. It is our hope that this will again offer a virtual forum for collegiality that will also be experienced at the in-person portion of the 2024 Annual Meeting. Finally, this year's interactive Post Graduate Course is the Protected Airway Collaborative Learning Course led by Jonathan St. George, MD, from Weill Cornell Medicine. Special thanks to Dr. St. George and his team for their exceptional effort planning this course!

Also, back again from the 2023 Annual Meeting is the wildly successful Trivia Night. This year's Trivia Night is again being developed by a team led by Peter Ward. Members of this team include Sarah Keim-Janssen, Bobbi Morgan, and Edgar Meyer. Trivia Night at this year's meeting will be hosted by Edgar Meyer. A special thanks to all individuals involved.

There are a number of new additions to this year's meeting. For example, at the opening reception Dan Thompson, will display some of his masterful body works and be finishing an actual piece during the reception. Additionally, on Tuesday night, Abha Goyal, MD, Associate Professor in the Department of Clinical Pathology and Laboratory Medicine at Weill Cornell Medicine, will be delivering The Papanicolaou Lecture. This will be a special lecture due to Dr. Papanicolaou's connection to Weill Cornell Medicine.

continued on next page

Preliminary Planning for Future AACA Meetings

One of my goals for the MOPP Committee is to have in place early the future AACA Annual Conferences. Thus far, we have been able to plan the following:

- 2025 Annual Meeting of the AACA to be held at the Hyatt Regency Bellevue in Seattle (Bellevue), Washington June 16-19, 2025 and hosted by R. Shane Tubbs and Joe Iwanaga.
- 2026 Annual Meeting of the AACA to be held at the Mayo Clinic in Rochester, Minnesota June 16-19, 2026 and hosted by Nirusha Lachman and Jonathan Torrens-Burton.
- 2027 Annual Meeting of the AACA to be held at Texas Tech University Health Sciences Center in Lubbock, Texas and hosted by Kerry Gilbert and Keith Bishop. Exact dates in June 2027 are yet to be determined.

If you are interested in hosting a regional and/or annual meeting, please contact the ASG office via email (aca@clinical-anatomy.org).

Abstract Submissions

Each year, the MOPP Committee reviews all its documents, including the Abstract Submission Guidelines, in an effort to improve clarity. The AACA works to accept completed, original, previously unpublished work that has IACUC and IRB approval, if applicable.

The table below shows the recent trends regarding abstracts, attendance, and presentations at our conferences:

Meeting Stats	2024 New York	2023 Orlando	2022 Fort Worth	2021 Virtual	2020 Virtual	2019 Tulsa	2018 Atlanta	2017 Minneapolis
Initial Abstract Subs	132	96	97	78	141	97	147	135
Late-Breaking Subs	27	35	15	18	15	11	15	10
Returned for Format	7	1	32	0	15	16	13	10
Total Rejections	0	6	7	9	6	3	2	1
Registrants	130*	289	282	338	437	290	350	345
Platform Presentations	16	16	17	12	27	20	24	16
Tech Fair Presentations	8	5	7	0**	0**	0**	7	7
Publishable/Postable Posters	124	58	65	51	104	63	98	97
Non-Publishable/ Non-Postable Posters	10	45	5	17	19	11	29	22

*Registration for the 2024 AACA Annual Scientific Conference is ongoing, and this number is as of April 30, 2024.

**No Tech Fairs were held during the 2019-2021 AACA Meeting as not enough abstracts were submitted to necessitate the session. Additionally, virtual meetings do not provide the hands-on opportunities the in-person meetings achieve, which are needed for this event to be successful.

Please let the MOPP committee know of any improvements we can make to the conference through emailing those listed above and/or completing the post-conference survey. As always, we are striving to provide you with the best conference possible.

In closing, as this is my last conference as the AACA Program Secretary, let me take this opportunity to thank those involved in making the last six (6) years of the AACA conferences so successful. Additionally, it has been my honor to serve the AACA in this role.

Respectfully Submitted on Behalf of the MOPP Committee,
Jennifer M. Burgoon, PhD
AACA Program Secretary

Nominating Committee Report

The Nominating Committee consists of presidential appointees Jonathan Wisco (Chair) and Kimberly Topp, and elected members-at-large Edgar Meyer, Samir Anadkat, Rebecca Pratt. We identified a diverse group of candidates from active members of AACA for this year's election beginning in December/January. Over the subsequent two months, the committee deliberated over the candidates' qualifications and contributions to our association, then determined finalists to contact for interest in nominations. After receiving confirmation, a slate of candidates was sent to Mohammed Khalil, the Association Secretary. Each candidate was directed to send a copy of their CV and candidacy statement to the committee and to the association in care of Caitlin Hyatt, the Executive Director.

Bylaws Committee Report

Kazzara Raeburn, Chair

Rachael George

Kathleen Bubb

Ameed Raof

Adam Kolatorowicz

The Bylaws Committee makes recommendations to the Council on amendments to the Bylaws. The committee held several video-conferencing meetings to discuss proposed changes to the bylaws. These revisions were submitted to the AACA Council. Proposed amendments were undertaken to better align the bylaws with both actual and best practices, as well as to reflect important changes that have occurred in the AACA organizational structure.

The Bylaws committee continues to review the Bylaws posted on the AACA website. If you are interested in serving and want to learn more about how our association works then please attend the annual business meeting, where you will be able to meet and interact with our committee members.

American Association of Clinical Anatomists Donor Statement

The AACA would like to thank the individuals who have donated their bodies and tissues for the purpose of advancing medical education and research.

Abstracts – Platform Presentations

*Tentatively Accepted for Electronic Posting on Clinical Anatomy site
(Listed by presenting author last name)

PLATFORM SESSION 1 (HEAD & NECK) - WEDNESDAY, JUNE 19 FROM 9:15 AM - 10:30 AM

Wednesday, June 19 at 9:15 AM

*HAIKATA, Yuto^{1,2}, Aya HAN¹, Yoko TABIRA¹, Keishiro KIKUCHI¹, Eiko INOUE¹, Joe IWANAGA^{1,3,4}, Jingo KUSUKAWA², Tsuyoshi SAGA⁵, and Koichi WATANABE¹. ¹Department of Anatomy, Kurume University School of Medicine, Fukuoka, 8300011, Japan; ²Dental and Oral Medical Center, Kurume University School of Medicine, Fukuoka, 8300011, Japan; ³Department of Neurosurgery, Tulane University School of Medicine, New Orleans, LA, 70112, USA; ⁴Department of Oral and Maxillofacial Anatomy, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, 1138519, Japan; ⁵Domain of Anatomy, Kurume University School of Nursing, Fukuoka, 8300003, Japan.

Three-Dimensional Analysis of Facial Muscles at Corners of Mouth Using Micro-Computed Tomography.

INTRODUCTION. The modiolus of the face is a nodule formed by the facial muscles that converge at the corners of the mouth. However, its precise area and structure remain uncertain because various definitions have been proposed. Furthermore, the thin and delicate nature of the facial muscles makes detailed analysis by conventional gross dissection difficult. This study was performed to provide useful information for the diagnosis and treatment of conditions requiring facial soft tissue surgery as well as facial anti-aging treatments by analyzing three-dimensional structures. **METHODS.** Ten hemi-sides of the angle of the mouth were collected from 10 formalin-fixed cadavers. The collected tissues were soaked in a phosphotungstic acid solution to enhance the contrast of the soft tissue. A three-dimensional computed tomography scan of the tissues was then performed. The images were analyzed using image analysis software (NeuroLucida; MBF Bioscience, Williston, VT, USA) to evaluate the convergence patterns of the facial muscles in the corners of the mouth. **SUMMARY.** The modiolus consisted of the levator anguli oris and depressor anguli oris in the superficial layer, and the buccinator consistently joined these muscles in the deeper layer in all cadavers regardless of age. The muscle fibers of the levator anguli oris and depressor anguli oris overlapped each other, and their boundaries were unclear. By contrast, the routes of the risorius, platysma, and zygomaticus major were inconsistent, likely because of age-related muscle atrophy. **CONCLUSIONS.** Three-dimensional microcomputed tomography enables detailed observation of the convergence patterns of the facial muscles of the angle of the mouth without invasive examination procedures. It also facilitates three-dimensional measurement of facial soft tissues and enables detailed analysis of aging-related changes.

Wednesday, June 19 at 9:30 AM

*IWANAGA, Joe^{1,3}, Keiko FUKINO³, Norio KITAGAWA³, and R. Shane TUBBS^{1,2}. ¹Department of Neurosurgery, Tulane University School of Medicine, New Orleans, LA, 70112, USA; ²Department of Structural & Cellular Biology, Tulane University School of Medicine, New Orleans, LA, 70112, USA; ³Department of Oral and Maxillofacial Anatomy, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, 1138519, Japan.

Newly Revealed Anatomy of the Buccinator: Three-Dimensional Analysis with Clinical Applications.

INTRODUCTION. Our current anatomical knowledge of the buccinator muscle (BM)'s origin, i.e., thin attachments on the maxilla and mandible and the pterygomandibular raphe (PMR) is not supported by anatomical dissection of this muscle. Such a misunderstanding can lead to iatrogenic injury and misdiagnosis. Therefore, this study aimed to investigate the detailed morphology of the BM and associated structures (e.g. PMR) and to discuss its function and clinical significance. **METHODS.** The anatomy of the BM and related structures was investigated using a surgical microscope and histological analysis in 15 cadaveric heads. **SUMMARY.** The PMR was not identified during gross anatomical or histological observations. The mandibular origin of the BM was only found in a small retromolar area (internal oblique line) and this shared a common tendon with the deep tendon of the temporalis. The maxillary origin of the BM was only found on the maxillary tuberosity. The muscle fibers originating from the retromolar area and maxillary tuberosity joined the superior pharyngeal constrictor muscle (SC) to become the BM. **CONCLUSIONS.** Our new findings suggest that the retraction force of the BM is in a more anteroposterior direction than an oblique direction, and fibers from the mandible and maxilla might reinforce the retraction force of the SC and might enable the SC in swallowing more efficiently. Surgical procedures such as myomucosal flaps using the BM and various periodontal surgeries need to be revisited and could be modified based on our anatomical findings.

continued on next page

Abstracts - Platform Presentations continued

Wednesday, June 19 at 9:45 AM

*LESSER, Emma R., Chung Yoh KIM, Juan J. CARDONA, Keishiro KIKUCHI, Aaron S. DUMONT, Joe IWANAGA, and R. Shane TUBBS. Department of Neurosurgery, Tulane School of Medicine, New Orleans, LA, 70112, USA.

Intramuscular Course of the Greater Occipital Nerve: Implications in Occipital Neuralgia.

INTRODUCTION. Occipital neuralgia has many etiologies. One of these is compression of the greater occipital nerve (GON) along its course. In this regard, one relationship of the GON, its course through the obliquus inferior capitis (OIC) muscle, has yet to be well studied. Therefore, the current anatomical study was performed to elucidate this relationship better. METHODS. Over three years, the suboccipital triangle was dissected in 72 adult cadavers (144 sides) to analyze the relationship of the GON to the OIC. Histological samples were taken from GONs with a typical course around the OIC, and nerves found to pierce the OIC. Samples were also taken of the adjacent dorsal root ganglion in these specimens. SUMMARY. The GON was found to pierce the OIC on four sides (2.8%), unilaterally in two cadavers and bilaterally in one cadaver. Two cadavers were male, and one was female. The GON of all four sides identified histological changes consistent with nerve compression (e.g., epineurial and perineurial thickening). Additionally, the number of neuronal cell bodies in the adjacent dorsal root ganglion was decreased compared to controls. CONCLUSIONS. Entrapment of the GON by the OIC, although uncommon, may be an underrecognized etiology of occipital neuralgia.

Wednesday, June 19 at 10:00 AM

*NOEL, Geoffroy¹, Cheyenne MERCER¹, Amir MORADI¹, Steven HOWE¹, Jack RYAN², Joy BALTA¹, and Preetham SURESH². ¹Department of Surgery, University of California, San Diego, La Jolla, CA, 92093, USA; ²Department of Anesthesiology, University of California, San Diego, La Jolla, CA, 92093, USA.

Efficacy of AR-Guided Nerve Blocks Among Anesthesiology Residents and Attendees.

INTRODUCTION. Anesthesiologists heavily rely on palpation to navigate their procedures; however, ensuring consistently successful outcomes demands years of experience. Recent studies have begun to investigate the application of augmented reality (AR) in clinical contexts. This study endeavors to assess the feasibility and efficacy of employing augmented reality to overlay radiological images on cadaveric donors, providing clinicians with real-time guidance during local anesthesia. METHODS. Three body donors were scanned, and CT images were uploaded to an Microsoft HoloLens 2 headset using Surgical AR[®] (Medivis). Eight anesthesia residents and faculty were instructed to perform one of three challenging nerve blocks: (I) glossopharyngeal, (II) superior laryngeal, and (III) inferior alveolar nerve block; using methylene blue. Each participant performed the same block with and without AR guidance. Photographs of the dissection fields after injections were taken to assess if the nerves were dyed blue. The average time to perform the injection with AR guidance was also collected. SUMMARY. The success rate was 50% without AR and 16% with AR guidance. The average time to perform an injection under AR guidance was 37.2 seconds which is acceptable. Participants expressed that it was hard to see soft tissue during the overlay when performing the glossopharyngeal nerve block. Others expressed technical difficulties such as flickering in the tracker and inability to detect the virtual guide showing distance to target. Those could explain why the success rate is lower under AR guidance. CONCLUSIONS. AR guidance is a suitable option for training local anesthesia, but future analyses will assess the impact of participant background on the success rate of AR-guided local anesthesia. More data are currently being collected with 8 additional participants and 4 more body donors, with an internal control of an easier local anesthesia; the inferior orbital nerve block.

Abstracts - Platform Presentations continued

Wednesday, June 19 at 10:15 AM

*SRIDHAR, Swathi, Dominic E. MAIURO, Chloe N. MAYE, Cameron T. SMITH, Phil T. SHERIDAN, Farida MEHRHOFF, and Robert A. HILLARD. Department of Pathology and Anatomical Sciences, Kansas City University College of Osteopathic Medicine, Joplin, MO, 64804, USA.

Characterization of Stenosis in Midwestern (US) Cadavers with Circle Of Willis (CoW) Variation.

INTRODUCTION. The Circle of Willis (CoW) provides critical cerebral perfusion but often shows variation. Such variation may impact blood flow and predispose to atherosclerotic disease. Investigation of cadavers with a focus on CoW variation and associated stenosis was performed. **METHODS.** Twenty-five adult CoWs were dissected from Midwestern-sourced cadavers and photographed using a dissecting microscope. Length, diameter, and percentage of stenosis data were obtained through ImageJ software and analyzed using Welch's t-test and Pearson's product-moment correlation in R-Studio software. **SUMMARY.** Twenty-three cases showed variations (92%), with the most prevalent variations seen in the posterior communicating artery (68%, PComA), anterior communicating artery (56%), and anterior cerebral artery (48%). Overall, PComA hypoplasia ($\leq 1\text{mm}$ diameter) was the most common type of variation observed (62%). Most stenosis in the efferent and afferent vessels was in the middle cerebral artery (36%, MCA) and internal carotid artery (52%, ICA), respectively. The overall stenosis and the efferent stenosis were negatively correlated with the vessel diameter in the posterior CoW variants ($p = 0.004$, $r = -0.57$ and $p = 0.006$, $r = -0.55$, respectively). Furthermore, as the PComA diameter decreased, afferent and efferent stenosis increased ($p = 0.04$, $r = -0.51$). Additionally, the prevalence of ICA stenosis was greater in the case of bilateral PComA hypoplasia compared to unilateral PComA hypoplasia ($p = 0.03$). **CONCLUSIONS.** There is a known association between PComA hypoplasia and stroke, which becomes more pronounced with ICA occlusion. The observed association between variant CoWs and stenosis in our study may be caused by hemodynamic changes due to decreased diameter, especially in the PComA (i.e., hypoplasia). Such PComA hypoplasia may lead to turbulent blood flow predisposing to afferent and efferent atherosclerotic disease, which in turn increases the susceptibility to stroke.

PLATFORM SESSION 2 (CLINICAL APPLICATIONS AND ANATOMICAL SERVICES) - WEDNESDAY, JUNE 19 FROM 1:45 PM - 3:00 PM

Wednesday, June 19 at 1:45 PM

*ARNOLD, Denise M.J.¹, Emily S. HO², Sharon SWITZER-MCINTYRE³, and Anne M.R. AGUR¹. ¹Division of Anatomy, Department of Surgery, University of Toronto, Toronto, ON, M5S 1A8, Canada; ²Department of Occupational Science & Occupational Therapy, University of Toronto, Toronto, ON, M5G 1V7, Canada; ³Department of Physical Therapy, University of Toronto, Toronto, ON, M5G 1V7, Canada.

Innervation of Posterior Elbow Joint Capsule: Clinical Implications for Treating Elbow Joint Pain.

INTRODUCTION. Osteoarthritis is a disabling disease affecting 595 million individuals (2020). Ultrasound (US) guided peripheral nerve block (PNB) and radiofrequency ablation (RFA) have been used to treat knee, hip, and shoulder pain, targeting articular nerves. RFA and PNB have not been developed for the elbow due to lack of anatomical knowledge. The purpose of this study is to determine the innervation of the posterior elbow joint capsule in 3D, compare innervation patterns, and identify bony and soft tissue landmarks that could be used to target articular nerves with US guided PNB and RFA. **METHODS.** Six embalmed specimens with mean age 90 ± 4 years (5F/1M) were used. The nerves innervating the posterior elbow joint capsule were dissected, digitized, and modelled in 3D space. Bony landmarks, muscle surfaces and superficial veins were also digitized. The 3D models were used to determine frequency of innervation by each articular branch, analyze innervation patterns, and identify bony and soft tissue landmarks that could be used to localize articular nerves with US. **SUMMARY.** Articular innervation of the posterior elbow joint capsule was from branches of 1) ulnar nerve: directly to joint capsule (83% of specimens); motor branches e.g. to flexor carpi ulnaris (100%), 2) radial nerve: posterior cutaneous nerve of forearm (50%); motor branches to anconeus (100%) and triceps (100%), 3) medial cutaneous nerve of forearm (83%). Each articular nerve innervated a specific area of the joint capsule, visualized on a frequency map. Main landmarks that could be used to localize the nerves with US include medial and lateral epicondyles, olecranon, medial and inferolateral margin of triceps, and basilic vein. **CONCLUSIONS.** The elbow joint capsule is innervated by numerous nerves with varying frequency and course. This pilot study indicated that there may be consistent bony and soft tissue landmarks to identify these nerves using US, enabling the development of evidence-based US protocols for PNB and RFA.

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Abstracts - Platform Presentations continued

Wednesday, June 19 at 2:00 PM

*YU, Paula J., John TRAN, and Anne M.R. AGUR. Division of Anatomy, Department of Surgery, University of Toronto, Toronto, ON, M5S 1A8, Canada.

Relationship of Saphenous Nerve to Medial Genicular Nerve: Implication for Knee Joint Denervation.

INTRODUCTION. Symptomatic osteoarthritis in individuals over 45 years of age has been estimated to be 16.7% in the United States. Inferior medial genicular nerve (IMGN) is one of several nerves that are ablated to treat osteoarthritis-related medial knee joint pain. More recently, it has been proposed to add the infrapatellar branch of the saphenous nerve (IPBSN) to the protocol. However, the 3D relationship of the IMGN to the branches of IPBSN has not been elucidated. The purpose of this study is to: 1) define IPBSN branching pattern(s) in 3D space and determine their frequency; 2) assess spatial relationships of branches of IPBSN to IMGN; 3) determine if capturing IPBSN could result in additional benefit to existing protocol. METHODS. The IPBSN and IMGN were serially dissected to their termination, digitized, and modelled in 3D in 7 specimens (mean age 91.3 ± 6.5). The 3D models were used to analyze the course and branching patterns of the IPBSN in each specimen. Next, branching patterns of IPBSN were defined and their frequency determined followed by documentation of the spatial relationship of IPBSN to IMGN. The spatial relationships of the two nerves were used to assess anatomically the efficacy of including IPBSN in the protocol. SUMMARY. The IPBSN was found to have three branches, superior, middle, inferior ($n=3$); two branches, superior, inferior ($n=3$); unbranched ($n=1$). The IPBSN was located superficial to the branches of IMGN. The IMGN branches lay either just proximal to the superior branch of the IPBSN ($n=3$) or overlapped with the branches of IPBSN ($n=4$). Furthermore, the IPBSN did not innervate the knee joint capsule in any specimen. When considering RFA lesion size, as stated by the manufacturer, the lesion would capture both the IMGN and IPBSN when they are overlapped. CONCLUSIONS. The IPBSN has a variable branching pattern. The IPBSN lies superficial in close relationship to the IMGN when their branches are overlapped resulting in lesion of both nerves using a standard lesion size. Importantly, the IPBSN did not innervate the knee joint capsule and thus would not likely add benefit to the protocol.

Wednesday, June 19 at 2:15 PM

*MAYE, Chloe N., Cameron T. SMITH, Swathi SRIDHAR, Dominic E. MAIURO, and Robert A. HILLARD. Department of Pathology and Anatomical Sciences, Kansas City University, Joplin, MO, 64804, USA.

The Role of Aortic Root Anatomy in Transcatheter Aortic Valve Replacement: A Cadaveric Study.

INTRODUCTION. Coronary circulation is known to vary by geographic region. Coronary ostial obstruction (COO) after transcatheter aortic valve replacement (TAVR) is associated with significant mortality. An American Midwestern cadaveric study characterizing the aortic root was performed for the purpose of better understanding the risk of COO. METHODS. The aortas of forty-seven cadavers from a Midwestern donor program were dissected. Triplicate measurements were taken, including aortic annulus (AA) circumference, sinotubular junction (STJ) circumference, sinus of Valsalva (SOV) circumference, right and left coronary ostial heights, aortic cusp heights, and the distance between the right and left coronary ostia and their respective cusp. Diameter and area were calculated from circumference measurements. Data was compared across biometric information using Welch's t-tests (sex and history of cardiovascular disease [CD]) and linear regression models (body mass index [BMI] and age). SUMMARY. The average heights of the left coronary ostium (LCO) and right coronary ostium (RCO) were 12.71 ± 2.51 mm and 14.81 ± 3.06 mm, respectively. Comparing measurements across sex revealed significant differences for AA area, STJ diameter, SOV diameter, and RCO height, in which the averages of these measurements were lower in females than males (p -values all <0.025). No statistical significance was seen with respect to CD, BMI, or age. Our average LCO height fell below the minimum accepted cutoff (≤ 14 mm) for increased risk of COO following TAVR procedures, as given by a current artificial valve manufacturer. Lower average values for AA area, STJ diameter, and SOV diameter are known to be associated with COO following TAVR, thus the values observed in females from the study population would put them at higher risk for COO. CONCLUSIONS. This study contributes to our understanding of the aortic root and raises concern of COO following TAVR in a Midwestern population.

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Abstracts - Platform Presentations continued

Wednesday, June 19 at 2:30 PM

*NOEL, Geoffroy¹, Sarah BEYDOUN², and Gabriel VENNE². ¹Division of Anatomy, Department of Surgery, University of California San Diego, La Jolla, CA, 92037, USA; ²Division of Anatomical Sciences, Department of Anatomy and Cell Biology, McGill University, Montreal, H3A 0C7, QC, Canada.

Comparative Microbiological Analysis of Human Bodies Embalmed with Soft-Preservation Techniques.

INTRODUCTION. Soft embalming techniques are increasingly utilized in anatomical and surgical education, necessitating effective embalming methods to preserve tissue integrity while mitigating biohazard risks. This study investigates different soft-embalming techniques to assess their efficacy in controlling bacterial colonization, crucial for cadaver safety and suitability. A comparative analysis of bacterial growth in oral and anal regions of cadavers embalmed with Imperial College London Soft-Preservation (ICL-SP), Freedom Art and Formaldehyde methods aims to identify the most effective technique in limiting bacterial proliferation. METHODS. Swabs from 45 cadavers embalmed using these techniques were collected and analyzed at MUHC-Op+ilab. Bacteria were categorized into biohazard levels 1 and 2, with Chi-Squared Tests used for comparison. An intervention study on 12 cadavers assessed the impact of extra fixative injections on bacterial loads and biohazard levels, analyzed via one-tailed paired t-tests. SUMMARY. Significant differences in bacterial distribution were observed among embalming techniques ($\chi^2 = 8.45$, $df = 2$, $p = 0.0146$). Freedom Art exhibited the lowest bacterial growth, with averages of 1.551 (SD 1.62) colonies for Level 1 and 0.2 (SD 0.45) for Level 2 bacteria per body. ICL-SP showed 1.207 (SD 0.41) colonies for Level 1 and 0.400 (SD 0.55) for Level 2, while Formaldehyde exhibited 2.3 (SD 2.95) colonies for Level 1 and 0.300 (SD 0.48) for Level 2. The intervention study did not significantly reduce bacterial levels ($t = -1.45$, $df = 11$, $p = 0.175$), suggesting limited efficacy of extra fixative injections. CONCLUSIONS. Freedom Art appears as a potentially safer embalming method with minimal bacterial growth. However, ongoing research is essential to refine embalming practices, balancing preservation effectiveness with safety in educational and research contexts.

Wednesday, June 19 at 2:45 PM

*WILSON, Amanda R.¹, Howard M. BROOKS¹, and Steven LABRASH². ¹Willed Body Program, School of Medicine, University of California, Irvine, Irvine, CA, 92697, USA; ²University of Hawai'i, Department of Anatomy, Biochemistry and Physiology Willed Body Program, 651 Ilalo Street, BSB 119B, Honolulu, HI, 96813, USA.

Preparation of a Consented Donor for Educational Use as a Skeleton in the Anatomy Lab.

INTRODUCTION. A skeleton from a consented donor is a valuable and ethical resource in the anatomy classroom because of historical practices in which donors were often obtained without consent from culturally and racially marginalized populations. RESOURCES. One anatomical donor was prepared using a #60 blade scalpel and an aneurysm hook, separated into sections. Each section was then tracked by utilizing an electronic database and identification tag. Initial section was then placed into a dermestid beetle colony tank for consumption by the colony, while the remaining sections were frozen until later use. After the soft tissues were consumed by the colony, the sections were then submerged in an undiluted lab grade acetone for two days to allow for fat deposit removal, then rinsed thoroughly. The section was then submerged in an undiluted 30% Hydrogen Peroxide to achieve an aesthetic quality and disinfection for two to three days, then rinsed and allowed to air dry before articulation. Items utilized were thermal plastics and a hot glue gun for creating disc spaces and other cartilages needed. A hand drill with a selection of drill bits, a clear sealant, a water kettle, jewelry wire, wire snips, small screws, small springs, hinges, and a rope for the stand were used. DESCRIPTION. Creating a fully articulated human skeletal model, using only one consented anatomical donor, provided a learning model for the classroom, through the use of standard anatomy dissection instruments, reclaimed parts found from previous models, and newly purchased materials. SIGNIFICANCE. A consented donor for skeletonization, along with acquiring the skills necessary for preparation, will serve as a unique educational model for observation of the human skeletal system.

Abstracts - Platform Presentations continued

PLATFORM SESSION 3 (EDUCATION) - WEDNESDAY, JUNE 19TH FROM 4:30 PM - 6:00 PM

Wednesday, June 19 at 4:30 PM

*MOVINSKY, Cassandra L., Brittany E. KENNEDY, Jessica L. CAMMARATA, Joseph M. KRILICH, and Mattie R. BOSSLER. Saint Francis University, Loretto, PA, 15940, USA.

In Situ Intact Cranial Nerve and Pathway Dissection via Stepwise Hemispherectomy.

INTRODUCTION. Traditional methods of dissection and instruction of cranial nerves involve removal of the cranium, severing of the nerve pathways, and rotation of the brain to view the nerves from an inferior view. The anatomical significance of the pathways of the cranial nerves often eludes students due to the disruption of the nerves. In order to address this concern, a method was developed to permit the study of intact cranial nerves and their pathways, while preserving an intact hemisphere to increase and improve understanding of the spatial relationship between the cranial nerves and other neuroanatomical structures. RESOURCES. Cadavers were obtained by the Human Gift Registry; they were used prior in a Gross Anatomy laboratory, including facial and deep neck dissection. Calvarium was not disturbed prior to the cranial nerve dissection. DESCRIPTION. To meet the learning needs of students, a stepwise hemispherectomy procedure was developed to preserve the origin and pathway of each cranial nerve. This allowed for the anatomical study of the intact hemisphere, cranial nerves, cerebellum, and brainstem. The stepwise approach permits the study of neuroanatomy during dissection and the ability to visualize intact cranial nerves as they exit their respective fossa. Paired with other dissections the entire pathway of the cranial nerves can be dissected, visualized, and studied. SIGNIFICANCE. Dissection provides an indispensable method of learning. Allowing students the opportunity to visualize cranial nerve origins to their exit in their respective fossa provides a better spatial understanding of the neuroanatomy of cranial nerves.

Wednesday, June 19 at 4:45 PM

*BUENTING GRITTON, A. Cory¹, Tony HARPER¹, Adam KOLATOROWICZ¹, and Jeffrey A. CHESNUT². ¹Department of Anatomy, DeBusk College of Osteopathic Medicine, Lincoln Memorial University, Knoxville, TN, 37932, USA; ²Department of Clinical Medicine, DeBusk College of Osteopathic Medicine, Lincoln Memorial University, Harrogate, TN, 37752, USA.

Hands-On Anatomy Centered Ultrasound Affects eFAST Exam Performance: A Randomized Controlled Trial.

INTRODUCTION. Ultrasound (US) is often integrated with medical gross anatomy (MGA) as hands-on anatomy centered US (HOACUS) sessions to introduce a clinical skill and apply anatomy. Visuospatial and psychomotor abilities are important to learning anatomy and performing US exams, like the extended focused assessment with sonography for trauma (eFAST) exam. The study objective was to evaluate the relationship of visuospatial ability, psychomotor ability, and HOACUS training with eFAST exam performance in a randomized controlled trial. METHODS. First year medical students (n=97) completed an initial Mental Rotation Test (MRT) and Purdue Pegboard Test (PPBT). Subjects were randomized into an experimental group (n=55), which received US introduction and three HOACUS sessions (thorax & heart, abdomen, and trans-abdominal pelvis) alongside MGA, or into a control group (n=43), which did not receive supplemental US training. At MGA conclusion, the control group received US introduction, then both groups received eFAST exam training. Participants were assessed by a trained faculty member using a previously validated 24-item checklist. An ANCOVA was used to determine the effects of HOACUS training, MRT, and PPBT on eFAST scores. SUMMARY. ANCOVA results indicated the HOACUS grouping variable (control and experimental) and one covariate (initial right-hand PPBT score) were significant (p<0.05). The experimental group had a predicted eFAST performance score of 8.33 and the control group a score of 7.79 (effect size=0.54). The coefficient of initial right-hand dexterity and the effect size of HOACUS training had similar estimated values predicting eFAST exam performance (0.45 and 0.54). CONCLUSIONS. This study indicated a small but significant impact of dexterity and HOACUS sessions on eFAST exam performance. Additionally, this study shows that the effect of our HOACUS training is roughly equivalent to a one unit increase of right-hand dexterity when performing the eFast exam.

Abstracts - Platform Presentations continued

Wednesday, June 19 at 5:00 PM

*MEYER, Carolyn A., Kenneth R. IVIE, Brian P. KELLY, Brandon LOWRY, Chad EITEL, Heather HALL, and Tod R. CLAPP. Biomedical Sciences, Colorado State University, Fort Collins, CO, 80523, USA.

Can AI Make You a More Efficient Educator? Successes and Failures of Grading with AI.

INTRODUCTION. Generative artificial intelligence (AI) models are developing rapidly and have the potential to be a valuable tool in education. While AI has been widely used to develop multiple choice question banks, in this study we explored the use of ChatGPT in grading anatomical essay writing. This had dual purpose in improving efficiency of grading for faculty while supporting learning for students. RESOURCES. ChatGPT 4 (OpenAI) was used to grade a series of anatomical essays with a regional anatomy focus. ChatGPT utilized faculty developed rubrics to grade these essays. DESCRIPTION. Anatomical essays composed by students were uploaded to ChatGPT to assess content accuracy and comprehensiveness of the essay. ChatGPT was provided with a specific set of instructions, the question, and a detailed point-driven rubric before grading individual essays. The results from ChatGPT grading were closely aligned with faculty grading, with some inconsistencies noted for nuanced explanations. Additionally, student feedback and perceptions of the process noted a diversity of responses around using this emerging technology. SIGNIFICANCE. Generative AI models have incredible potential to support educators and students alike. Detailed rubrics support ChatGPT and hone the accuracy of AI's grading for anatomical essays. Further, development of custom, task specific GPTs increase the accuracy and address grading inconsistencies seen with complex anatomical content. Generative AI models are an accessible tool that can easily be implemented to support education in the anatomical sciences. This project will help to inform future development of AI tools that will directly benefit the educational community.

Wednesday, June 19 at 5:15 PM

*PANDALAI, Uma¹, Punnose K. KATTIL¹, Yolanda SALINAS-ALVAREZ¹, Helga N. OLSON², Jadran, QURRATULAIN¹, and Wojciech PAWLINA¹. ¹Department of Clinical Anatomy, Mayo Clinic, Rochester, MN, 55905, USA; ²Division of Surgical Services, Mayo Clinic School of Health Sciences, Mayo Clinic, Rochester, MN, 55905, USA.

Anatomy Video Dialogs: A Tool to Stimulate Student Engagement in Surgical First Assistant Course.

INTRODUCTION. Anatomy educators, continue to explore innovative approaches to enhance engagement, increase motivation, and reinforce students' knowledge. Learning Management Systems (LMS) such as D2L Brightspace are reliable platforms for delivering content to students allowing the inclusion of diverse resources enabling students to choose their preferred learning tool. Instructor previews of Brightspace data suggests low student engagement with prerecorded lectures. To increase engagement with the didactic component an additional resource was developed to incorporate into the Surgical First Assistant Anatomy Course at Mayo Clinic. 'Anatomy Dialogs' were created as recorded videos that captured free flowing conversations between anatomists and health care professionals. The framework of 'Anatomy Dialogs' is built on unscripted spontaneous conversation that offers a different perspective of the same content in a more relaxed tone of presentation, and the re-emphasis on clinical context through multidisciplinary discussion stimulates student interest in revisiting curricular content. Present study aims to evaluate student engagement and overall perception of anatomy dialogs. METHODS. A mixed method approach was used combining focus group discussions with students using thematic data analysis, and quantitative data analysis obtained from LMS based on number and length of views. SUMMARY. Qualitative analysis highlighted student perception of value of resource for learning, impact of different format of presentation in reinforcing concepts, increased depth of understanding through clinical context and student re-engagement with didactic component. CONCLUSIONS. This study provides insight into the potential additional resources to stimulate student engagement with course didactic component. Anatomy dialogs offers an alternate approach as a supplemental tool for increasing student curiosity and reinforcing understanding of contextual anatomy.

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Abstracts - Platform Presentations continued

Wednesday, June 19 at 5:30 PM

*BRUECKNER-COLLINS, Jennifer and Emily PORTA. Department of Anatomical Sciences and Neurobiology, School of Medicine, University of Louisville, Louisville, KY, 40202, USA.

Measuring Changes in Teamwork Competency Domains in the Medical Gross Anatomy Laboratory Experience.

INTRODUCTION. While adoption of competency-based medical education for resident training is well documented, it is less common in preclinical medical education. The gross anatomy laboratory is an opportune venue to implement competency assessment during preclinical training. This mixed-methods research study determined how first-year medical student self- and peer-assessments of teamwork in the gross anatomy lab context change over time and analyzed student reflections to contextualize the experiences they had whilst developing the teamwork competency during the gross anatomy course. METHODS. First-year medical students in the fall of 2022 completed quantitative self- and peer-assessments of teamwork skills using the Teamwork Performance Scale (TPS) at the beginning and at the end of the gross anatomy course (n = 83). The students also completed three competency development portfolio (CDP) entries throughout the course (n=83). Qualitative thematic analysis with grounded theory was used to analyze these CDP reflections during the course. SUMMARY. There was a statistically significant increase in TPS-self-assessment scores from Time 1 (mean or M = 4.70, standard deviation or SD = .341) to Time 2 (M = 4.78, SD = .279), with p = .009. The mean difference in TPS-self-assessment scores was -.085. There was no statistical difference in TPS-peer-assessment scores from Time 1 (M = 4.81, SD = .300) to Time 2 (M = 4.85, SD = .234), with p = .055. The mean difference in TPS-peer-assessment scores was -.048. Thematic analysis of CDPs revealed that initially, students set goals focused on collaboration skills, team engagement, problem solving and leadership preferences. These themes shifted as the course proceeded, with a latter emphasis on specific areas to improve teamwork skills, feelings toward feedback from team members, and recognizing future benefits of teamwork skills. CONCLUSIONS. First-year medical students reflected upon and demonstrated self-perceived growth in the Teamwork competency, while no significant change was observed in peer assessment of teamwork in the gross anatomy lab context. These findings support the incorporation of team building exercises, coaching and feedback with the use of competencies in the gross anatomy lab context.

Wednesday, June 19 at 5:45 PM

*WINK, Alexandra E. Department of Radiology, UMass Chan Medical School, Worcester, MA, 01655, USA.

Integrating Disability into Functional Anatomy through an Introduction to Adaptive Equipment.

INTRODUCTION. According to the CDC, up to 27% of adults in the United States have a disability, and this proportion is expected to increase. Future physicians should be prepared to counsel patients with permanent or temporary disabling conditions. This includes an awareness of adaptive technology and equipment to assist disabled individuals in performing activities of daily living (ADLs). To initiate exposure to adaptive equipment in the preclinical years of medical school, didactic materials and hands-on activities about adaptive equipment were incorporated into an existing Functional Anatomy session at UMass Chan Medical School. RESOURCES. The Functional Anatomy session is delivered at the end of the Skin and Musculoskeletal Systems block in the first-year medical student curriculum. This session previously consisted of several stations wherein students performed various ADLs (e.g., using a screwdriver, stepping into a bathtub) and described the muscle groups and nerves required to perform them. Students were then asked how a nerve lesion or inability to move a joint would affect their ability to perform an ADL. Members of on-campus disability groups and occupational therapists were consulted to discuss adaptations for patients with disabilities or the mobility limitations described in these exercises. DESCRIPTION. Each station was set up with instructions, as described above. In addition, a handout was included with each station that included photos and descriptions of various adaptive equipment. When feasible, examples (e.g., self-opening scissors, grip aids) were available for students to use. Written feedback about the session will be collected from end-of-course evaluations. SIGNIFICANCE. Physical disability education can be integrated into musculoskeletal anatomy education. Introduction to adaptive equipment for ADLs can occur while teaching functional anatomy to prepare students to treat patients with accessibility needs.

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Abstracts – TechFair Presentations

*Tentatively Accepted for Electronic Posting on Clinical Anatomy site
(Listed by presenting author last name)

TECHFAIR - TUESDAY, JUNE 18 FROM 4:30 PM-6:00 PM

Tuesday, June 18 at 4:30 PM

*BISHOP, Keith N. Department of Medical Education, Texas Tech University Health Sciences Center, Lubbock, TX, 79424, USA.

Using a 3D Printed Mold to Ensure Anatomical Positioning of a Fresh Brain for Accurate Evaluation.

INTRODUCTION. A brain bank has existed at Texas Tech University Health Sciences Center for many years. Most donors suffered from neurodegenerative conditions. To prepare a brain for storage, it was cut in the median plane. The right half was placed in formalin and the left half was sectioned into coronal slices and placed into individual pouches. Each pouch was then deposited in an ultra-low freezer (-800C) for storage. Unfortunately, at the time of sectioning, many of the brain slices shifted prior to freezing which resulted in a distorted appearance. When the frozen slices were later evaluated, the distortion made it difficult to locate specific brain structures. To address this issue, we created a three-dimensional (3D) container to hold the brain in the correct position. RESOURCES. The container described was created by a 3D printer into the shape of a human skull. The walls were printed thinly to avoid insulation. DESCRIPTION. We wrapped the fresh brain in clear film, placed it in the container and into the freezer for one hour. We then removed it from the freezer, and quickly cut it into thin coronal slices. Those sections were placed into pouches and returned to the freezer. We found that having the brain held in the correct anatomical position while it froze, ensured that the shape was maintained, allowing identification of the desired structures. The first versions of this container were 2 sided with the brain being held in an inverted vertical position. This container was too narrow making it difficult to remove the nearly frozen brain. We have settled on a one-sided container that supports the brain in a horizontal position and makes removal simple and leaves the brain undamaged. SIGNIFICANCE. The use of this 3D printed container has significantly improved the method of preserving fresh brains in anatomical position. Having the brain sections in correct alignment allows the exact identification of the brain structures to be scientifically evaluated.

Tuesday, June 18 at 4:35 PM

*SPARLING, Matthew R., Kathleen B. ALSUP, Glenn M. FOX, Philip H. BARRISON, Alexandra H. VINSON, and Emily A. BALCZEWSKI. University of Michigan Medical School, Ann Arbor, MI, 48109, USA.

Guidelines for Clinical Anatomy Educators to Create High-Quality Electronic Flashcards.

INTRODUCTION. Electronic flashcards (EFs) and EF platforms, such as Anki and Quizlet, have become a widely used eLearning resource by medical trainees. The content on these platforms is created almost exclusively by students with minimal oversight or feedback from content experts. This study aims to provide guidelines for anatomy educators so that they can create high-quality Efs for anatomical concepts. RESOURCES. The EF creation guidelines were based on an inductively and deductively generated qualitative framework developed to describe the content, format, and knowledge representation of Efs for undergraduate medical education (manuscript in preparation). To describe the types of knowledge and learning processes in Efs, we adapted Marzano and Kendall's 'The New Taxonomy of Educational Objectives'. DESCRIPTION. Examples and vocabulary were curated to illustrate the range of design approaches for Efs that test anatomical concepts. These examples drove the development of guidelines to design Efs that target different groups of medical learners or curricular objectives. For example, one guideline suggests using a specific question-answer format for more advanced medical learners to encourage higher-order thinking skills, such as the integration of anatomical concepts into medical decision making. These guidelines were designed to be accessible for educators without prior experience using or creating Efs. SIGNIFICANCE. Resources students use to learn medicine are rapidly advancing and anatomy educators must adapt their educational techniques to encourage their students' success. Efs are heavily utilized by medical students, but rarely are these cards created by anatomy experts or integrated into existing anatomy curricula. As Efs continue to grow in popularity, it is necessary that anatomy content experts have guidelines for curating high-quality Efs, rather than relying on learners who may lack the requisite knowledge to create high-yield learning materials.

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Abstracts - TechFair Presentations continued

Tuesday, June 18 at 4:40 PM

*CEVALLOS, Manuel E.¹, Steven L. FERNANDES², and Carina COOK². ¹Medical Education Department, School of Medicine, Creighton University, Phoenix, AZ, 85012, USA; ²Computer Science & Informatics, College of Arts and Sciences, Creighton University, Omaha, NE, 68178, USA.

TAKAI: Generative AI for Teaching Anatomy.

INTRODUCTION. The Anatomy course is one cornerstone of medicine for future healthcare professionals. Anatomy is not just the hands-on activity in the lab to recognize anatomical structures; it is the correlation of those structures in applying clinical aspects to interpret images, performing routine procedures, and understanding the causes of disease. All of these are benefits and safety for patients. Medical education has evolved in the last decades, incorporating digital material (online digital books, SmartBooks, and anatomical digital software) to help students learn. Integrating Generative Artificial Intelligence (AI) in Anatomy education presents a promising avenue for exploration. We propose developing a digital application that can be accessed through a smartphone or tablet. This application will deliver specific knowledge from a particular source, answer questions to users, and generate new questions to test the students in real-time. **RE-SOURCES.** Anatomical information was collected from StatPearls, an NIH book, under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits others to distribute the work, provided that the article is not altered or used commercially. You are not required to obtain permission to distribute this article, provided that you credit the author and journal. We use a Machine Learning platform to load information. **DESCRIPTION.** The selected information was loaded into the Machine Learning platform (ML). After testing the reliability of the answers, the ML was built as an app for a smartphone. The App allows to give inputs in audio or text for questions related to the selected topic and also can create questions to test the student. **SIGNIFICANCE.** This new educational tool for anatomy using generative AI can facilitate learning for students and refresh information in faculties with the following advantages: easy access, using a specific source, easy to switch information accordingly of the topic in class, and auto-generate questions with answers and explanations to auto-test users.

Tuesday, June 18 at 4:45 PM

*BUSECK, Alison, Carsyn DYKES, Jason HORTON, and Jennette BALL. SUNY Upstate Medical University, Syracuse, NY, 13210, USA.

The Use of 3D Printed Models in Conjunction with Cadaveric Anatomy Teaching.

INTRODUCTION. Anatomical knowledge is the basis of medicine with cadaveric dissection as a classic teaching approach. With technological advancements, new modalities such as 3D printed models, are employed to demonstrate anatomical structures and their functions. This study aimed to determine the effectiveness of 3D printed models to enhance medical students' understanding of the extensor digitorum (ED), flexor digitorum profundus (FDP), flexor digitorum superficialis (FDS), lumbricals (L), opponens pollicis (OP), ulnar claw (UC), and hand of benediction (HOB). **METHODS.** An open source hand model was modified and 3D-printed (Phrozen Mini 8K). Ligaments were simulated with elastic cord, and muscles and tendons were represented with monofilament (Cortland Line). The models were presented during a hand dissection lab, demonstrating the flexion of FDS and FDP at the metacarpophalangeal (MCP), proximal interphalangeal (PIP), and distal interphalangeal (DIP) joints, flexion at MCP by L, extension of ED, opposition of OP, and the pathogenesis of UC and HOB. After the session, students were sent an anonymous and voluntary survey to evaluate the presentation. The survey consisted of 8 questions regarding level of understanding and helpfulness of the models using a Likert scale with response options 1 (strongly agree or very helpful) through 5 (strongly disagree or very unhelpful). **SUMMARY.** There were 21 survey responses. The average responses to the understandings were: ED (1.76), FDP (1.76), FDS (1.76), L (1.81), OP (1.76), UC (1.76), and HOB (1.81). The mode of each response to understanding was 1. The average and mode of responses to this activity's helpfulness was 1.48 and 1, respectively. **CONCLUSIONS.** Based on our survey results, students mostly felt that these models were helpful in furthering their understanding of the ED, FDP, FDS, L, OP, UC, and HOB. 3D printed anatomical models could be a beneficial addition to cadaveric gross anatomy labs for health profession students.

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Abstracts - TechFair Presentations continued

Tuesday, June 18 at 4:50 PM

*KALIDINDI, Yuktesh V.¹, Daniel T. DALY^{1,2}, and Jay M. BAUMAN^{1,2}. ¹Saint Louis University School of Medicine, Saint Louis, MO, 63104, USA; ²Center for Anatomical Science and Education, Department of Surgery, Saint Louis University School of Medicine, Saint Louis, MO, 63104, USA.

3D Reconstruction and Printing of Skulls for Medical Education.

INTRODUCTION. 3D printing is a technology with immense potential to advance medical education. By implementing 3D models in the anatomy curriculum, students can engage in tactile learning outside the cadaver lab. In this study, we investigated the utility and efficacy of 3D printed models of human skulls as a viable study aid for first-year medical students. We hypothesized that students who made use of the 3D models would demonstrate greater knowledge of cranial anatomy while also reporting that the model is at least as useful as a real human skull. **METHODS.** Medical CT imaging of a human skull was segmented into a 3D reconstruction using 3D Slicer software. Following image processing, 30 plastic skulls were manufactured on two Fused Deposition Modeling printers. After recruiting subjects (n=155) to participate in the study, one printed skull and one real human skull were distributed to each group of six students. Students were free to study from either skull as much as they chose over a four-week period. Afterward a survey was distributed inquiring about their use of the 3D model and opinions as to its effectiveness. Survey responses were evaluated, and students were stratified into three groups based on whether they spent more, less, or equal time with the 3D model compared to the cadaveric skull. Student performance on relevant cranial anatomy exam questions was also analyzed. **SUMMARY.** No significant differences were observed in written exam or lab exam performance between the three groups. Students conveyed that the 3D printed model was a superior study tool compared to 2D images and atlases. **CONCLUSIONS.** Student performance demonstrated that the 3D printed model was just as effective a study tool as the cadaveric human skull. Although students may not have preferred the 3D models to actual skulls, the results indicate that the models may still offer benefits as more accessible and cost-effective study aids.

Tuesday, June 18 at 4:55 PM

*SMITH, Cameron T.¹, Omer RIYADH¹, Morgan W. STEWART¹, Chloe N. MAYE¹, Dominic E. MAIURO¹, Swathi SRIDHAR¹, Robert A. HILLARD¹, Lyon HOUGH¹, J. P. BROOKS². ¹Department of Pathology and Anatomical Science, Kansas City University, Joplin, MO, 64804, USA; ²Department of Biomedical Science, Missouri State University, Springfield, MO, 65897, USA. Smartphone Thermal Angiography Screening for Carotid Stenosis: A Cadaveric Study.

INTRODUCTION. Previous investigations into the use of thermal imaging have demonstrated its potential utility in angiography. However, no published literature has explored the application of thermal imaging in the detection of carotid stenosis in a cadaveric population. This study aims to be the first to investigate the use of smartphone thermal imaging for the detection of carotid stenosis and classification based on current standard levels of stenosis: mild (<49%), moderate (50-69%), severe (>70%). **METHODS.** Twenty-four human cadavers were used to investigate forty-seven carotid arteries. Dissection was performed to expose the carotid triangle of the neck where the common carotid artery was accessed with an angiocatheter. Cooled and/or heated water was injected to simulate differences between operating room and human core temperatures. Thermal carotid angiography was recorded using a FLIR One Edge Pro thermal imaging camera attached to an iPhone, and suspected stenosis locations were marked on the carotid surface. After completion of the thermal angiograms, the carotid bifurcations were resected and serially sectioned into 3 mm slices for gross pathological evaluation of the degree of stenosis using the established NASCET criteria. **SUMMARY.** Moderate stenosis was detected in six carotids and severe stenosis was detected in seven carotids. Compared to gross assessment of carotid sectioning, thermal angiography was 100% sensitive and specific for both moderate and severe stenosis with no false positives recorded. **CONCLUSIONS.** High sensitivity and specificity were achieved in the detection of moderate to severe stenosis with user-friendly equipment and limited angiography experience. Potential applicability may include completion angiography, or the assessment of vascular anastomosis sites and arterial runoff in peripheral vascular surgical procedures. Thermal angiography shows promise as a low-risk, non-contrast evaluation of vascular anatomy of the carotid bifurcation.

Abstracts - TechFair Presentations continued

Tuesday, June 18 at 5:00 PM

*MACPHERSON, Brian R.¹ and James G. TIEMAN². ¹Department of Neuroscience, University of Kentucky College of Medicine, Lexington, KY, 40536, USA; ²BOLD Education, Antioch, TN, 37013, USA.

Integration of Oral Histology Lecture and Lab Materials into a Comprehensive Learning Experience.

INTRODUCTION. Basic histology and associated labs have disappeared from many medical, dental and allied health curricula. However, oral histology remains an important niche topic in dental curricula. Integration of dental-related basic medical science into an introductory core course is becoming the norm. RESOURCES. All lecture, lab and associated learning enhancements were imported into Articulate 360 software, where together with Storyline 360, Rise 360 apps, and Chat GPT AI integrated the materials into a one-stop learning experience for each oral histology topic easily imported and fully functional in our Canvas LMS. DESCRIPTION. Each topic module is composed of: Lecture material in .pdf and .ppt formats; Study Objectives with linked explanatory text from the lecture; Preloaded flash cards; Defined Terms with drop-and-drag matching; a Focused Laboratory component with text linked to highlighted labels in the image; and an Assessment portion with didactic and laboratory exam-style questions with explanatory text for each right or wrong answer choice. SIGNIFICANCE. Various members of last years D1 class, that took the old style oral histology course/lab have participated in a multistep development assessment of this one-stop integrated learning experience. They predict a smoother, less time-consuming, assimilation of the basic science of oral histology integrated into their clinical learning pathway.

Tuesday, June 18 at 5:05 PM

*COEY, James^{1,2} and Jack PARKER² ¹St. George's University, Grenada, West Indies; ²Northumbria University at Newcastle, Newcastle-upon-Tyne, NE2 4DN, UK.

AIATELLA in Clinical Anatomy & Imaging: An International Multi-Centre Case Study.

INTRODUCTION. With a focus on cardiovascular anatomy & pathology, our initial study built on a proof-of-concept study conducted with NHS colleagues in the UK comparing the 'AIATELLA' AI with assessment of aortic root and valve planimetry. This multi-site investigation has since obtained ultrasound CT, and MRI scans to further inform the AI across different anatomical sites and pathologies. RESOURCES. An extensive collection of resources has been employed for this project, AIATELLA's algorithms coupled with a diverse dataset comprising over 50,000 cardiovascular imaging scans sourced from the US, UK & India. This dataset encompasses a wide spectrum of cardiovascular pathologies, ensuring the robustness and generalizability of the AI models developed. DESCRIPTION. Harnessing deep learning algorithms trained on the comprehensive dataset, AIATELLA autonomously identifies and quantifies anatomical variations and pathologies across the aortic root, carotid arteries, and abdominal aorta. Clinicians' appraisal of normal vascular anatomy and pathology with that of the AI. Accuracy, speed of analysis, and reproducibility were the focus, along with the inter and intra-operator variability paramount to clinical practice. SIGNIFICANCE. AIATELLA utilization of an international network across multiple anatomical sites demonstrates the significance of AI in clinical anatomy within the domain of cardiovascular disease. AI facilitates anatomical education by providing interactive learning experiences and elucidating complex cardiovascular structures and functions. Ultimately, the integration of AI holds immense promise for advancing cardiovascular healthcare delivery and improving patient outcomes.

Abstracts – Poster Presentations

*Tentatively Accepted for Electronic Posting on Clinical Anatomy site
(Listed by presenting author last name)

POSTER SESSION 1 – TUESDAY, JUNE 18 FROM 3:15 PM - 4:15 PM

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*ANGELES, Miguel, Darren SALMI, Ian WHITMORE, and Sakti SRIVASTAVA. Division of Clinical Anatomy, Stanford University School of Medicine, Stanford, CA, 94305, USA.

Designated Team Roles in Dissection Lab: A Novel Approach to Enhance Student Professionalism.

INTRODUCTION. Dissection in the Anatomy lab is typically a team activity; however, specific team roles have not been previously designated at each dissection table at our institution. Team dynamics can vary significantly at each table, consequently impacting individual student motivation and overall lab experience. **RESOURCES.** In recent years, teamwork has emerged as a crucial component of effective and safe healthcare workflow. Drawing inspiration from team-based practices in the operating room and emergency department, we designed specific team roles for members of each dissection team. These roles included Team Lead (TL), Dissection Lead (DL), and Dissection Associate (DA). Each team member at all dissection tables rotated through every role on an ongoing basis throughout the duration of the course. Students were made aware of specific duties and responsibilities for each role at the start of the course and periodically throughout the course. **DESCRIPTION.** We evaluated the impact of introducing designated team roles for dissection lab sessions using a combination of observations by the teaching team including attendance, student engagement, quality and completeness of work – all features of professionalism. We also analyzed end-of-course student feedback to assess student views on designated team roles. Team roles seemed to increase attendance and students favored knowing their role for each session. **SIGNIFICANCE.** Successful team-based dissection during Anatomy lab sessions has the potential to enhance student professionalism. Introducing this exercise at an early stage in the training of healthcare professionals helps prepare students for this format of workflow which they are sure to encounter in the future.

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*BACHLER, Madison E. and Gurvinder KAUR. Department of Medical Education, Graduate School of Biomedical Sciences, Texas Tech University Health Sciences Center, Lubbock, TX, 79430, USA.

Go with the Flow: Visualizing Embryological Development with Flowcharts to Supplement Learning.

INTRODUCTION. Embryology has been a historically difficult subject for first-year medical students to understand. While various resources are available to supplement learning, there is a noticeable scarcity of resources to augment embryology comprehension. A needs-analysis survey revealed that 77.7% (n=67) of second-year medical students believed additional resources could have supplemented their understanding of embryology. Moreover, 73% of students rated their perceived difficulty of embryology material at 6 or higher on a 1-10 scale. We hypothesized that developing an active-learning resource, specifically embryology flowcharts, would improve both student comprehension and performance in the realm of embryology material. **METHODS.** Each week of the Anatomy, Histology, and Embryology block (AHE), students received fillable flowchart templates aligning with embryology lecture content for that week. At the end of the week, a mini-quiz comprising 10-15 questions was released with answer rationales for prompt feedback. The subsequent week, faculty-vetted, completed versions of the flowcharts were provided to students for comparative analysis with their individually-filled flowcharts. Preceding each unit exam, a comprehensive post-quiz was provided to students with respective rationales. **SUMMARY.** During AHE, 73% (n=47) of students incorporated flowcharts as a resource. Student (n=31-99) performance on post-quizzes significantly improved as compared to pre-quizzes (unit 1- 63% vs 78%, unit 2- 52% vs 73%, unit 3- 70% vs 82%; p<0.001). Interestingly, students who utilized both flow charts and quizzes (n=82, 31%) performed significantly higher on embryology exam questions as compared to students who didn't utilize these resources (n=46, 29%). **CONCLUSIONS.** The data suggests that utilizing flowcharts as an active-learning embryology resource enhances both student understanding and performance, especially in establishing strong comprehension of foundational embryologic concepts.

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Abstracts - Poster Presentations continued

This study was conducted under QIRB #22069.

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*BRADSHAW, Emily L., Logan MICHALSKI, and Patrice FREDERICK. College of Medicine, University of Central Florida, Orlando, FL, 32832, USA.

Surgical Videos Help First-Year Medical Students Perform Cadaveric Surgical Procedures.

INTRODUCTION. Robotic technology has transformed multiple surgical procedures, allowing surgeons to reach narrow areas of the body, minimize tissue trauma, and improve the perioperative experience. Many first-year medical students study human anatomy and spend time in the anatomy lab performing dissection of anatomical donors. Typically, the dissections are performed superficial to deep, but students may benefit from a robotic technology assisted internal point of view dissection, providing them with images they will see in future surgical rotations. **METHODS.** In this study, 12 first-year medical students who indicated interest in surgical specialties watched either a surgical video showing an open Transversus Abdominus Release (TAR) procedure or a robotic TAR procedure. After watching the video, teams of 3 students replicated the open TAR surgical approach on a cadaver. At the conclusion of the procedure, students completed a survey about their dissection experience and the helpfulness of the video they watched. Then, the team watched the other surgical video, and then completed surveys about their impression of the helpfulness of the second video. **SUMMARY.** As this was the student's first cadaveric dissection TAR procedure experience, both groups reported that the TAR procedure was difficult. We hypothesized that the students would find the open TAR video more helpful compared to the robotic TAR video. However, both groups indicated that the video they watched prior to the procedure, whether robotic or open TAR, was equally helpful. An open-ended question asking students to compare their experience between the open and robotic videos showed that some students found the robotic video more disorienting. Additionally, both groups indicated that they would like more surgical procedure videos in the curriculum. **CONCLUSIONS.** Surgical videos and cadaveric surgery appear to be an engaging way to enhance and emphasize anatomy content in the undergraduate medical curriculum. Future directions include a larger scale study of pre-clerkship student impressions of surgical videos, student preference for robotic or open surgical videos, and longitudinal studies that examine student retention of important anatomical views.

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*BROWN, Sophia E., Zoe J. BOWEN, Lily L. ROSATI YOOS, and Sumathilatha SAKTHI VELAVAN. Marian University College of Osteopathic Medicine, Indianapolis, IN 46222, USA.

A Unique Case of Post-Aneurysmal Cerebral Atrophy and its Implications on Alzheimer's Disease.

INTRODUCTION. Subarachnoid hemorrhage (SAH) is known to have a high mortality rate and poor prognosis. Literature on histopathological changes suggests that there is glial scarring in the short term, but there is limited research on its long-term changes with age-related neurodegenerative disorders. This report aims to investigate a unique combination of healed SAH and Alzheimer's Disease (AD) pathology in a cadaver. **RESOURCES.** Upon dissection of a 90-year-old female donor, significant atrophy and a large concavity in the right frontal lobe were discovered. A scar was found on the right frontoparietal bone, suggesting surgical intervention. A detailed examination of the skull, cerebral hemispheres, ventricles, and vasculature was performed, and photographs were taken. Tissue samples were obtained from both frontal lobes for histopathological examination. **DESCRIPTION.** The donor's past medical history revealed that she had SAH secondary to an aneurysm and underwent surgery when she was in her 30s. The donor's cause of death was determined to be AD. Further examination of the cerebrum revealed size differences between hemispheres. The right hemisphere (15 X 5.5 X 9 cm) was visibly smaller than the left (16.5 X 5 X 9 cm). The concave defect in the frontal lobe measured 4 X 3 X 2.5 cm. Histopathology exhibited significant gliosis and corpora amylacea (CA). **SIGNIFICANCE.** Subarachnoid hemorrhage is known to cause ischemic complications and glial scarring. Initially, glial scarring is protective, but it can become deleterious over time. The presence of CA is a common finding in aging and AD. The donor had extensive CA, more than the typical presentation, which was likely related to the long-term effects of SAH-induced ischemia. These findings necessitate further research to understand the pathogenesis of AD in a patient with a history of cerebral ischemia.

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Self-Efficacy of Physical Therapist Clinicians for Applied Clinical Anatomy.

INTRODUCTION. Self-efficacy is defined as an individual's own judgement of their capabilities to successfully perform a task, which has been shown to influence academic behaviors, choice in activities, amount of effort put forth, and persistence. While investigating the importance of anatomy to physical therapist practice, it is critical to determine where differences exist in the self-efficacy of licensed physical therapists for applied clinical anatomy. **METHODS.** A six-question instrument to assess physical therapists' self-efficacy for applied clinical anatomy was developed by modifying the Anatomical Self-Efficacy Instrument (ASEI). A sample of 84,456 practicing physical therapists within the United States were identified for the study. Physical therapists with board specialist certification and those without were compared using the modified self-efficacy instrument. **SUMMARY.** Of the 4,536 participants (5.4% response rate), 3,914 participants completed all six items on the self-efficacy instrument. The coefficient alpha for the self-efficacy instrument was .92 indicating a high degree of internal reliability for the instrument. Principal axis factoring yielded one factor explaining 72.90% of the item variance. It was determined that physical therapists with a board certification had higher self-efficacy for applied clinical anatomy than those without a board certification [$t(3771) = -6.09, p < .001$]. Finally, physical therapists who identify as female had lower self-efficacy for applied clinical anatomy than those who identify as male [$t(3856) = -13.641, p < .001$]. **CONCLUSIONS.** Physical therapists with a board specialist certification were found to have a higher self-efficacy for applied clinical anatomy than those physical therapists without a board certification. Additionally, physical therapists who identify as female were found to have lower self-efficacy for applied clinical anatomy than those who identify as male.

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*CEVALLOS, Manuel and Claudia MARES. Medical Education Department, School of Medicine, Creighton University, Phoenix, AZ, 85012, USA.

Anatomy Student Mentorship Program: More Than Anatomical Concepts.

INTRODUCTION. At the start of Creighton University School of Medicine's (CUSOM) gross anatomy course, we identified a need to provide teaching assistants to support students without a background in human anatomy, which developed an inequality in the academic area. Therefore, we created the Anatomy Student Mentorship Program (ASMP), where upper-class medical students offered anatomy mentoring after hours. We evaluated the acceptance, advantages, and disadvantages of the Anatomy Student Mentorship Program in a cohort of first- and second-year medical students, where approximately 50% of students did not have a course in human anatomy. **METHODS.** Between October '23 and February '24, the ASMP was offered to MS1, MS2, and PA students at the CUSOM Phoenix Campus. Two hundred fifty-six mentees and eight mentors (between MS2, MS3, and MS4) were voluntarily invited to participate in a Likert survey question (IRB approved) using Qualtrics. **SUMMARY.** In the period described, after survey participation of 29.55%, only complete surveys were evaluated (fifty-six mentees and six mentors). 50% of mentees had never had an anatomy lab before attending CUSOM. Mentees reported they "strongly/somewhat agree" that the ASMP helped reduce stress (85.72%), increase confidence (87.5%), and improve knowledge (89.28%). Mentors reported they "strongly/somewhat agree" that ASMP can increase connection (83.33%), communication (100%), and collaboration (100%) 75% of mentees and 100% of mentors answered "yes" to return to this program. **CONCLUSIONS.** The ASMP exemplifies the transformative impact of student-led education, where mentorship serves as a vehicle for mutual growth and empowerment. In addition, the ASMP helps to dissolve the academic inequality between students with different academic backgrounds. By nurturing mentors' leadership potential (connection, communication, collaboration) and providing invaluable support to mentees (reducing stress, increasing confidence, increasing knowledge), the program cultivates a culture of collaboration and excellence within the academic community. Through ongoing evaluation and refinement, the ASMP will continue evolving to meet the needs of its participants, thereby contributing to the development of tomorrow's leaders.

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Anatomical Variations of Biliary Ducts and Arteries Relevant in Cholecystectomy: A Cadaveric Study.

INTRODUCTION. As laparoscopic approaches to cholecystectomy become more common, there is a concurrent increase in bile duct injuries, primarily stemming from the misidentification of biliary anatomy. Misidentification is attributed to the mismatch between unconscious assumptions of human visual perception and uncommon anatomical variations. As perfection cannot be expected from the human mind, there is a need to further the understanding of the uncommon anatomical variations of biliary structure and surrounding vasculature relevant to laparoscopic cholecystectomy. **METHODS.** 37 embalmed cadavers at the Faculty of Medicine at the University of British Columbia were dissected to reveal the gallbladder and the surrounding biliary structure and arteries. The length of the cystic duct, the point and aspect of the junction of the cystic duct with the common bile duct, and the relative location of the cystic artery were assessed either through direct measurement using a ruler or visual observation. Any alternative patterns in the arrangement of ducts and arteries were noted. **SUMMARY.** This study found uncommon anatomical variations that have been previously documented to be clinically relevant, such as the parallel course of the cystic duct with the common hepatic duct (2 cases; 6.9%), double cystic arteries (2 cases; 6.9%), and the cystic artery being present anterior to the common hepatic duct (10 cases; 34.5%). There was also a new variation found in one case (3.5%): the cystic artery located anterior to the right hepatic duct, with a relatively low bifurcation of the common hepatic duct into the right and left hepatic ducts. **CONCLUSIONS.** The results of this study contribute to the growing research into laparoscopic cholecystectomy and the reduction of bile duct injuries by providing further anatomical understanding. These findings can inform the development of more accurate and precise surgical practices, such as a simpler method of locating the course of the ductal system.

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CHUNG, Beom Sun¹, Jin Seo PARK², and Chung Yoh KIM³. ¹Department of Anatomy, Yonsei University Wonju College of Medicine, Wonju, Korea; ²Department of Anatomy, Dongguk University School of Medicine, Gyeongju, Korea; ³Department of Neurosurgery, Tulane Center for Clinical Neurosciences, Tulane University School of Medicine, New Orleans, LA, USA. Utilizing Real-Color Cadaver Volume Model to Aid Neurological Procedures.

INTRODUCTION. Neurological procedures such as trigeminal nerve block and deep brain stimulation demand a profound anatomical understanding of the head region. However, conventional methods such as anatomy atlases, cadaver dissections, and magnetic resonance images (MRIs) present limitations in providing comprehensive elucidation of head structures. In this study, we utilized cadaver sectioned images to construct a real-color volume model aimed at realistically depicting the head region. **METHODS.** A real-color volume model was generated from serial sectioned images of the human head, with a pixel size of $0.1 \times 0.1 \text{ mm}^2$ and an interval of 0.1 mm. The resulting model had a voxel size of $0.5 \times 0.5 \times 0.5 \text{ mm}^3$, dimensions of $414 \times 412 \times 469$, a file size of 98.3 MB, and was formatted as nii.gz. Unlike traditional MRIs, this real-color volume model vividly displayed three classical planes and oblique planes with actual color and shape. **SUMMARY.** The real-color volume model facilitated the concrete elucidation of all cranial nerve ganglia, essential for procedures like trigeminal nerve block. Moreover, for deep brain stimulation, the model accurately identified the entry point (crown of rostral middle frontal gyrus) and target point (dorsolateral part of subthalamic nucleus), which were then correlated with patients' MRIs and computed tomography images. Following anonymization, the real-color volume model has been made freely available on the project's homepage (neuroanatomy.kr). **CONCLUSIONS.** This innovative real-color volume model serves as a valuable resource for clinicians and medical students, enhancing their understanding of spatial head anatomy pertinent to neurological procedures and aiding in the interpretation of medical images.

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Anatomical Parameters of the First Dorsal Interosseous Muscle and Prevalence of Atypical Morphology.

INTRODUCTION. The first dorsal interosseous (DI₁) muscle coordinates flexion of the metacarpophalangeal joint, extension of the interphalangeal joints, and abduction of the index finger. Two superficial heads characteristically originate from the first and second metacarpals, converge, and insert onto the base of the proximal phalanx and extensor expansion of digit #2. Variations in DI₁ morphology are rarely described, and parameters for typical DI₁ anatomy have not been established. The purpose of this study is to quantify typical anatomical parameters of the DI₁ and determine prevalence of non-typical DI₁ morphology. **METHODS.** One hundred sixty-two DI₁ muscles were examined bilaterally on 81 adult human cadavers. The morphology of each DI₁ was categorized as Bicipital Bipennate (two heads forming bipennation), Accessory Head (exhibiting a third head), Bicipital Independent (two heads with no union), Unipennate (single interosseous head), or Other (uncategorical variant). Bicipital Bipennate DI₁ head separation, bipennation, and tendon lengths were measured along the muscle's longitudinal axis, and the width of each superficial head was measured mid-belly. **SUMMARY.** The prevalence of DI₁ categorical variants were as follows: Bicipital Bipennate (n = 112; 75.31%), Accessory Head (n = 21; 12.96%), Bicipital Independent (n = 10; 6.17%), Unipennate (n = 7; 4.32%), and Other (n = 2; 1.23%). Superimposing mean Bicipital Bipennate head separation (18.8 ± 7.3 mm), bipennation (24.9 ± 7.6 mm), and tendon (6.2 ± 4.0 mm) lengths with lateral (13.6 ± 2.8 mm) and medial (6.6 ± 2.5 mm) head mid-belly widths demonstrates the parameters of an archetypal DI₁. **CONCLUSIONS.** Non-typical morphology was present for nearly 25% of DI₁ muscles, and considerable parametric variation was also evident within characteristic DI₁ morphology. DI₁ variations could compromise the radialis indicis and princeps pollicis arteries, affect index finger function, and contribute to other clinical sequelae.

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*CORREIA, Janine C.¹, Karin BAATJES², and Kathryn SMITH³. ¹Division of Clinical Anatomy, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, 7500, South Africa; ²Dean's Division, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, 7500, South Africa; ³Department of Visual Arts, Faculty of Arts and Social Sciences, Stellenbosch University, Stellenbosch, 7600, South Africa.

Anatomy & Arts: Student Perspectives on Clay Modeling in Anatomy Education.

INTRODUCTION. Clay modeling (CM) has become an increasingly prevalent technique in the pedagogy of anatomy, serving as a supplementary method alongside traditional dissection sessions. This utilization of CM represents an active and tactile approach to learning, designed to augment student involvement and foster a deeper comprehension of gross anatomical relationships. Beyond the amplification of sensory engagement in the learning experience, the incorporation of CM has been observed to yield educational benefits through the facilitation of group interactions inherent in the construction process. The objective of this study was to investigate the efficacy of incorporating CM, guided by postgraduate Visual Arts students, as a supplementary pedagogical approach to bolster the comprehension of anatomy among undergraduate students specializing in clinical anatomy. **METHODS.** The investigation focused on assessing the impact of CM on students' acquisition, retention, and application of anatomical knowledge. Additionally, the study evaluated the potential advantages of interdisciplinary collaboration between anatomy and arts education. The cross-sectional study involved the implementation of CM and reflective practice to foster metacognition in third-year Anatomy students (n = 19). During the Applied Anatomy module, students worked collaboratively in groups to create anatomical clay models of the muscles of the face. Each group was supported by a postgraduate Visual Arts student serving as a mentor. As part of the assessment, the students completed a reflective assignment, based on Gibbs' reflective cycle. **SUMMARY.** Eighteen (18) students volunteered to take part in the study. The reflective assignments were qualitatively analyzed. Two themes became prominent from the thematic analysis of the reflective assignments, namely, 1) Collaboration and 2) Knowledge. **CONCLUSIONS.** The CM improved the participant's time management, cooperation abilities, and understanding of human anatomy. Overall, CM demonstrated the educational and developmental value of integrating science, art, teamwork, and creativity.

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Consensus Survey Report of the Fascia Subcommittee of the Clinical Anatomy Terminology Committee.

INTRODUCTION. The aim for this project is to address the differences between the current definition of fascia in *Terminologia Anatomica* and the one proposed by members of the Fascia Research Society through a standardized common definition. We are also evaluating the classification of fasciae in *Terminologia Anatomica* version 2 (TA2). **RESOURCES.** A list of approximately 300 candidate fascia terms was compiled from the TA2 database and other published resources. A pilot study was conducted amongst members of the Clinical Anatomy Terminology (CAT) fascia subcommittee to define which terms are included within fascia, to classify the candidate terms, and evaluate existing fascial definitions. Classification of terms followed an expanded list of TA2 categories (e.g., subcutaneous tissue, fasciae of muscles, and fasciae of body cavities). **DESCRIPTION.** A Qualtrics survey was developed based upon an expanded organization of fascia categories and distributed to members of a newly formed CAT fascia subcommittee. Survey data will assist in framing an updated definition within existing TA2 terms and established clinical anatomical usage, tempered by a growing knowledge of the structure, development, and function of “fascia” in the body. **SIGNIFICANCE.** A survey of fascia terminology by subject matter experts will hopefully clarify, from an anatomical perspective, which structures are considered fascia, update the classification of fasciae, and assist in improving educational clarity and interdisciplinary communication. A provisional report of the survey results from the subcommittee will be presented so that AACA members can be informed of progress and provide input. Expansion of the use of this survey tool is planned to include anatomical, clinical, and other professional societies.

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The Third Belly of Opponens Pollicis Muscle: A New Finding.

INTRODUCTION. The thumb is the only digit capable of opposition, a unique characteristic of the human hand. The opponens pollicis muscle (OPP) contributes to this function and in addition contributes to stabilizing the trapezio-metacarpal joint (TMJ) by its insertion on the TMJ capsule. We have recently identified fatty infiltration (FI) of the OPP as a common finding in patients with TMJ arthritis. This FI is found in a focal area of the opponens which we hypothesize to be an independent and apparently undescribed unit of the opponens muscle which we refer to as “the third belly”. The purpose of this study was: 1) to demonstrate the existence of the OPP third belly in cadaveric hands; 2) to describe accurately its insertion on the trapezium and first metacarpal; and 3) to investigate its independent character inside the OPP by analyzing its connection with the abductor pollicis longus (APL) tendon and its independent innervation from the two other bellies. **METHODS.** Ten fresh frozen cadaveric hands were dissected. Each OPP muscle belly, its slip connection with (APL) and its nerve branch were photographed. The bony insertions were identified and described. In three hands, a CT scan and MRI were performed prior to dissection. After dissection in these three hands, the OPP bony insertions were digitized to create a 3D model summarizing the findings. **SUMMARY.** The OPP third belly was found in all 10 cadavers dissected. It is the thinnest OPP belly. It completely covers the TMJ palmar capsule, with parallel fibers oriented transversely, which is different than the other two bellies. The trapezium insertion of the third belly included the entire trapezium palmar facet and the palmar TMJ capsule. We also observed a metacarpal insertion adjacent to TMJ capsule insertion, and we regularly observed a slip of APL tendon attaching to the third belly. The third belly innervation is directly from the motor branch of median nerve (MBMN). The identification of the third belly explained why fatty infiltration could be limited on MRI to a specific area of the OPP. The OPP third belly anatomical description is in favor of its independent structure and its specific function to stabilize the TMJ. **CONCLUSIONS.** This study identified and described a previously unnoticed OPP third belly with its insertion, structure, innervation and imaging characteristics.

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*HOSSEINZADEH, Ali, Manouchehr MADANICIVI, Lexi BUSSE, Majid ALIMOHAMMADI, and Majid DOROUDI. Department of Cellular & Physiological Sciences, Faculty of Medicine, University of British Columbia, Vancouver, BC, V6T 2A1, Canada. Anatomical Variations in the Origin and Course of the Inferior Mesenteric Artery: A Cadaveric Study.

INTRODUCTION. The inferior mesenteric artery (IMA) is the third main branch of the abdominal aorta (AA), supplying blood to the distal third of the transverse colon, splenic flexure, descending colon, sigmoid colon, and rectum. It branches to the left colic artery (LCA), sigmoid artery (SA) and superior rectal artery (SRA). The origin and branching pattern of IMA is highly variable in the normal population. The IMA and its vessels are among the most important anatomical landmarks in colorectal and vascular surgeries. Therefore, having a comprehensive understanding of variations of IMA is crucial for safer radiological and surgical procedures. This study aimed to characterize the variations in the origin and morphology of IMA and its branches. METHODS. The abdominal cavity of 32 embalmed cadavers was dissected. The origin of IMA from the bifurcation of AA to common iliac arteries and the branching of IMA to LCA, SA and SRA were determined. The ratio of the diameter of IMA to AA was calculated using a digital caliper. SUMMARY. The average distance between the origin of IMA and AA bifurcation was 4.4 cm and the ratio of the diameter of IMA to AA was 0.22. We created a novel comprehensive classification system of IMA branching with nine variations, such as IMA trifurcating to LCA, SA, SRA (n=8) and IMA branching to LCA and rectosigmoid artery and then bifurcating to SA and SRA (n=11). CONCLUSIONS. The findings of this study suggest that the bifurcation point of AA can be a landmark for locating IMA during procedures such as reimplantation of IMA in ischemic colitis and abdominal aortic aneurysm. The ratio of diameters can facilitate the diagnosis of IMA dilation in cases such as mesenteric ischemia. Moreover, the new classification of IMA branching could contribute to safer and personalized laparoscopic procedures of colorectal resection and radiological interventions.

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*HUTCHISON, Chloe J.¹, Sharbel K. KHOURY¹, Meghana V. PATHAPATI¹, Dalton J. ENNIS¹, Kauyen CHEN¹, Evangelia E. ANALITIS¹, Yun TAN^{1,2}, and Daniel T. DALY^{1,2}. ¹Saint Louis University School of Medicine, Saint Louis, MO, 63104, USA; ²Center for Anatomical Science and Education, Saint Louis University, Saint Louis, MO, 63104, USA. Unique Bilateral Variations in Axillary Artery Branching Patterns.

INTRODUCTION. Diverse variations in axillary artery branching patterns are frequently reported in the literature. Atypical branching patterns were observed containing large common trunks emerging from the right 2nd part and left 3rd part of the axillary arteries along with a right brachial artery branching variation, all of which make this case especially unique. RESOURCES. The variation was identified during routine dissection by medical students in a body donated through the Saint Louis University School of Medicine Gift Body Program with signed informed consent. DESCRIPTION. A large common trunk arising from the second part of the right axillary artery was identified providing seven arterial branches. From proximal to distal, these branches included a muscular branch to the subscapularis muscle, the lateral thoracic artery, the posterior humeral circumflex artery, the thoracodorsal artery, the anterior humeral circumflex artery, a muscular branch to the teres major muscle, and the circumflex scapular artery. The brachial artery then split into brachioradial and brachioulnar arteries. The brachioradial artery coursed medially and provided the inferior ulnar collateral artery. The brachioulnar artery gave off the deep brachial artery which further branched into the remaining three collateral arteries in the arm. In the left axillary artery, a similar common trunk was found arising from the third part including all the same branches except the muscular branch to the subscapularis muscle and the anterior humeral circumflex arteries, which arose directly from the axillary artery. SIGNIFICANCE. Knowledge of upper limb arterial variations may guide emergent surgical intervention and radiologic diagnosis. Furthermore, variations that begin as proximal as the one herein may have significant distal effects in the forearm and hand, potentially impacting surgical intervention throughout the upper limbs.

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Exploring Variation Between the Internal Carotid Artery, Carotid Canal, and Endocast Size.

INTRODUCTION. The internal carotid artery (ICA) is one of two sources of blood supply to the brain. Previous studies have inferred – based on ontogenetic and physiologic principles – that there is a relationship between ICA and internal carotid canal (ICC) size; however, the parameters of the relationship between ICC and ICA have not been explored. Additionally, the relationship between the ICA and brain size has been previously explored to show that an increase in perfusion rates is correlated with an increase in forebrain size in primates. The purpose of this preliminary project is to define the relationship between the ICC and ICA so that we can begin to answer questions on evolutionary selections for increased perfusion rates and brain size increase. **METHODS.** Using 3D slicer, endocast volume and surface area, ICC circumference, and ICA circumference were measured on 28 individuals (15 females, 13 males) [Cebus capucinus (6), Saimiri sciureus (6), Pithecia pithecia (2), Eulemur rufus (1), Galago sp. (2), Pongo sp. (1), Macaca sp. (4), Homo sapiens (6)] to examine the interaction, differences, and relationships between endocranial, ICA, and ICC size. **SUMMARY.** After size and logarithmic adjustments to the data, t-tests showed no significant differences in either ICA or ICC size between sexes or left and right sides (all p-values > 0.05). Phylogenetic generalized least squares (PGLS) analyses showed no significant correlation between ICC and ICA (p = 0.41) with the range of ICA/ICC ratio showing 43-99.9%. While there was a significant relationship between ICC and endocast volume (p = 0.03; R² = 0.46) and surface area (p = 0.02; R² = 0.49) there was not a significant relationship between ICA and endocast volume (p = 0.09) or surface area (p = 0.08). **CONCLUSIONS.** This exploratory data indicates that while the bony components are significantly related, larger sample sizes are needed to explore the variation seen in the relationship between ICC, ICA, and brain size.

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KIM, Trudy S., Angel E. CLEARE, Abraham ALATORRE, and Sakti SRIVASTAVA. Division of Clinical Anatomy, Stanford University School of Medicine, Stanford, CA, 94305, USA.
Evaluating the Efficacy of Photogrammetry in Enhancing the Gross Anatomy Dissection Experience.

INTRODUCTION. Evidence suggests that the gross anatomy dissection experience can be improved with the use of relevant imaging material, with 3D photogrammetry emerging as a novel resource. However, further research is needed to validate the usefulness of digital 3D projection models as a useful educational resource. **RESOURCES.** A digital version of our institution's prosection library was developed using Polycam, a 3D capture application for the iPhone, along with Sketchfab, a 3D modeling platform for immersive and interactive 3D models. A selection of the 3D models were selected and annotated on Sketchfab by researchers and faculty members, and all models were embedded onto a password-protected Google Site. **DESCRIPTION.** To assess the efficacy and usefulness of a digital 3D library of dissected human specimens for the learning of human anatomy in an undergraduate cadaveric dissection based course. **SIGNIFICANCE.** 3D photogrammetry models are a novel and accessible resource for students learning clinical anatomy, utilizing platforms that are growing more popular within the pre-medical and medical student populations. Additionally, use of the photogrammetry models can enhance learning by facilitating self-testing and independence when studying. While 3D photogrammetry models may not replace the experience gained from studying real cadaveric specimens, these models provide a more realistic and accurate study resource than the traditional digital models that exist today.

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Regression Analysis of the Relationship between the Alveolar Ridge and Lip.

INTRODUCTION. The lip is mainly composed of soft tissues, which obscures the direct relationship between the skeletal structure and its shape. This study investigated the relationship between alveolar ridge and lip by linear measurements. Applying those relationships between hard and soft tissue in the oral region would aid in assuming about the original lips. The collection and usage of the data were approved by the Institutional Review Board of the National Forensic Service (NFS2019MED03). **METHODS.** 3D head models of 178 subjects (89 female and 89 male) measured in a three-dimensional(3D) environment. The age group of subjects ranged from 20s to 60s. The 3D models were remodelled from computed tomography images and measured using Mimics (Materialise, Leuven, Belgium). The skeletal landmarks were on the upper and lower alveolar ridge and the occlusal level of the upper teeth. The skin landmarks were placed on the exterior line of the lip. All measurements started from the prosthion in three directions: the sagittal, coronal, and transverse. Correlation and regression analyses were performed with the total population, followed by each sex. **SUMMARY.** The sex showed a high correlation with a few distances using whole samples. Females showed a higher correlation in general, a high correlation in more measurements (Pearson's correlation > 0.6) and the highest value (0.77). None of the univariate regression analyses using the total population gave R² values larger than 0.6. The highest R² value among univariate analyses resulted in females with a coronal distance (0.59), while the highest was 0.46 in males. In this study, coronal measurements showed a higher level of relationship with the alveolar ridge and the lip. **CONCLUSIONS.** The lip and alveolar ridge entailed a level of relationship, but it was not absolute. However, in cases of no hint of the original lip shape, this study can serve as a reference for facial reconstruction.

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*KING, Rylee M.¹ and C. B. YOAKUM². ¹ Arkansas College of Osteopathic Medicine, Arkansas Colleges of Health Education, Fort Smith, AR, 72916, USA; ²Department of Anatomy, Arkansas Colleges of Health Education, Fort Smith, AR, 72916, USA. An Assessment of First Mandibular Molar Wear Across Archaeological and Historical Human Populations.

INTRODUCTION. Dental topography and tooth wear analyses have been extensively utilized in non-human primates to establish relationships between diet and the mechanical effects of food choice on dentition. Despite the insight that these studies provide on diet and environmental interaction, few studies have investigated these relationships in humans. This study uses first mandibular molar (M1) wear data from archaeological (Alaska, Greenland, Australia) and historical (United States) populations in order to evaluate the relationship between diet and wear patterns. **METHODS.** Using 3D slicer, we created a wear index (total wear/total occlusal surface; WI) and assigned a manual wear score (1-8; WS) to the M1 of 33 Homo sapiens (17 males, 16 females) from Alaska (n=7), Greenland (n=8), Australia (n=7), and the United States (n=10). Statistics were analyzed using R to establish differences and relationships between populations. **SUMMARY.** Paired t-tests showed no significant differences between individual left and right sides ($p > 0.05$) while t-tests showed no significant difference between sexes ($p > 0.05$). ANOVAs established a significant difference in wear indices and scores between the historical US collection and the archaeological populations of Alaska (WI, $p = 0.004$; WS, $p < 0.001$), Australia (WI, $p = 0.011$; WS, $p < 0.01$), and Greenland (WI, $p = 0.017$; WS, $p < 0.01$). Additionally, linear regressions showed that wear score and wear index are highly correlated variables ($p < 0.01$, $R^2 = 0.6913$). **CONCLUSIONS.** These results indicate that both wear indices and wear scoring can be used to evaluate dietary effects on human molar wear between populations, as seen previously in studies of non-human primates. The significant differences in wear patterns between historic individuals and archaeological populations can substantiate the use of wear indices and wear scoring to explore culturally, geographically, and chronologically diverse individuals.

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*KRAMER, Elizabeth¹, Isabella DE LA TORRE¹, Akhil KUMAR¹, Mary OKEMATTI¹, Zalan SHAH¹, Edward QUAN¹, Daniel DALY^{1,2}, and Yun TAN^{1,2}. ¹Saint Louis University School of Medicine, Saint Louis, MO, 63104, USA; ²Center for Anatomical Science and Education, Department of Surgery, Saint Louis University School of Medicine, Saint Louis, MO, 63104, USA. [A Unique Case of Left Posterior Mediastinal Venous Drainage.](#)

INTRODUCTION. The embryological origins of the azygos vein and its tributaries give rise to a wide range of variations in this venous system. The novel presentation of this combination of venous variations has not been found in the literature and demonstrates a very unique pattern for drainage of venous blood within the abdomen and thorax. **RESOURCES.** A 98-year-old female body was received through the Saint Louis University School of Medicine Gift Body Program with signed informed consent from the donor. Unique variations within the left azygos venous system were observed during routine dissection. **DESCRIPTION.** No left ascending lumbar vein was observed. Instead, the hemiazygos vein was formed by union of the left 1st lumbar vein, left subcostal vein, and left 11th intercostal vein. The hemiazygos vein connected with the left renal vein inferiorly and the accessory hemiazygos vein superiorly. The left 3rd and 4th lumbar veins drained directly into the inferior vena cava. The left 2nd lumbar vein drained into a vein that connected the left 3rd lumbar vein with the left renal vein. At the junction of the hemiazygos and accessory hemiazygos veins a commissural vein was observed crossing the midline between the 9th and 10th thoracic vertebral bodies entering the azygos vein. The accessory hemiazygos vein received the 5th to 9th intercostal veins, left superior intercostal vein and also connected with the left brachiocephalic vein. Additionally, the left supreme intercostal vein joined with the inferior thyroid vein before draining into the left brachiocephalic vein. **SIGNIFICANCE.** The azygos venous system plays an important role in collateral venous drainage between the inferior vena cava and the superior vena cava. Awareness of unique variations as described in this case is important radiologically and surgically as it relates to interventions involving the posterior mediastinum or vertebral column.

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[An Electron Microscopic Study of the Effect of Alprazolam on Stomach and the Role of Stem Cells.](#)

INTRODUCTION. Alprazolam is a benzodiazepine that is among the most prescribed psychotropic medications to manage panic and anxiety disorders. Neurobehavioral alterations, inflammation as well as adverse effects on the immune system and blood vessels, are some of the reported side effects of alprazolam. Several studies suggested a possible antioxidant effect of alprazolam, whereas other studies contradicted those findings while pointing out its involvement in gastric symptoms. The review of alprazolam's effects on the stomach, however, remains rare in literature. Bone marrow-derived mesenchymal stem cells (BM-MSCs) have been studied as a novel approach for management of stomach disorders through anti-inflammatory, angiogenic, antioxidant and antiapoptotic actions. The current study was designed to assess the ultrastructural alterations in adult male albino rats' fundic stomach in response to oral administration of alprazolam and to evaluate the modulatory effect of BM-MSCs on the alprazolam-induced alterations. **METHODS.** Forty adult male albino rats (Wistar strain; 170-200 g mean body weight) were used. Alprazolam was orally administered at a daily dose of 4mg/kg/day for 5 weeks then stem cells were given as a single intravenous injection (3×10^6 cell) at the beginning of the fifth week. The ultrastructural stomach tissue examination was then investigated by means of transmission electron microscopy. **SUMMARY.** Animals exposed to alprazolam developed features suggestive of necroptosis which were characterized by nuclear shrinkage and chromatin condensation, cytoplasmic vacuolation, swollen mitochondria and disruption of intracellular contents. Those findings were found to be ameliorated by the administration of the stem cells, which could broaden their future use in clinical practice. **CONCLUSIONS.** Treatment with stem cells caused an alleviation of the alprazolam-induced findings seen in the fundic stomach of adult male albino rats, as observed by electron microscopy.

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High Dynamic Range (HDR) Photogrammetry Technique: A Comprehensive Step-by-Step Guide.

INTRODUCTION. Photogrammetry is rapidly growing within the anatomical field, underscoring the need for descriptions of a comprehensive step-by-step guide to facilitate the pursuit of “High Dynamic Range” (HDR) photogrammetry scans to create realistic and accurate 3D models for educational purposes. This project endeavors to fulfill this need, aiming to establish a foundational step-by-step guide for the acquisition and implementation of “HDR photogrammetry” 3D models acquired using cadaveric dissections. **METHODS.** Three specimens – one dry skull, one formalin-fixed brain and one formalin-fixed and latex-injected specimen – were prepared, dissected, scanned and rendered into realistic 3D models using the “HDR photogrammetry technique”. **SUMMARY.** Specimens were placed in a flat and clean surface covered with black fabric and black background within a room with lighting sources perpendicular to the specimen to be scanned. The HDR photogrammetry technique can be acquired using either a professional photography camera or simply using a regular smartphone. Regardless the device in use, the technique consists in capturing the given specimen photodocumenting its features and anatomical structures in 360-degree. The images were acquired positioning the camera/smartphone in front of the specimens with a tripod extensively and meticulously photodocumenting the specimens using several angles rotating them on a turntable. The images were then rendered into the final 3D model using the software Agisoft Metashape[®] and finally uploaded into an online 3D platform – Sketchfab[®] – to be displayed using mobile devices such as smartphones, tablets, and computers. **CONCLUSIONS.** 3D models can be acquired and used for educational purposes and easily displayed on smartphones facilitating and enhancing the teaching-learning experience not only for students and learners but also educators. Thus, we strongly believe that this technical guide represents a step forward in the image definition of the photogrammetric model for neuroanatomical studies and Human Anatomy specimens in general.

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Anatomy Education during the Covid-19 Pandemic: A Systematic Review and Narrative Synthesis.

INTRODUCTION. The Covid-19 pandemic at the end of 2019 caused restricted business and social spheres because of the measures taken to limit and contain the spread of Covid-19 infections. As a result, the delivery of higher education at universities and medical schools was severely affected. **METHODS.** This article systematically reviewed the various methods used to deliver anatomical education, including lectures, practical labs, and assessments at different universities during the Covid -19 pandemic. The challenges that faced faculty, staff, and students in delivering anatomical education were also investigated. **SUMMARY.** The transition from traditional face-to-face lectures or assessments to online learning was less complicated. Anatomy practical teaching was the most challenging to redesign. Anatomy practical labs were delivered using digital anatomy resources in most universities that aimed to provide a “hands-on-like” experience. Resources used include 3D virtual software, digital Anatomage table, virtual microscopy, and broadcasting of the live dissection sessions. Some of the challenges faced by students include reduced interaction between students and lecturers and among students themselves; unstable learning environments like at-home distractions and technical challenges; and lack of access to learning resources like cadavers and anatomical models. This review also reported on how the pandemic brought to light the disparities in education systems, as shown by those facing challenges of unstable learning environments. **CONCLUSIONS.** This review summarizes the different methods used to deliver anatomy during the Covid-19 pandemic. The findings reveal how anatomy education continued and how it performed during the pandemic.

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3-Dimensional Architecture of Anconeus: Functional Implications of a Neglected Muscle.

INTRODUCTION. Studies of the muscle architecture of anconeus (AN) have been based on 2D analyses using photographs and manual measurements. Previous studies consist of serial dissection which only enables viewing in one plane at a time. These methodologies do not consider the 3D volumetric architecture of AN, which has implications for muscle function. There are currently no 3D studies of the musculoaponeurotic architecture of AN that consider the entire muscle volume (MV). The purpose of this study is to reconstruct the fiber bundle (FB) and connective tissue (CT) elements in AN in 3D to determine its volumetric morphology and compute functional architectural parameters. **METHODS.** The FBs of AN were serially dissected, digitized, and modelled in 3D in 8 specimens (mean age 81±12; M/F 6/2) to determine the arrangement of FB and CT elements in the MV. The data were used to determine the functional characteristics of AN in conjunction with the quantification of architectural parameters. **SUMMARY.** Based on the morphology, AN consisted of 3 architecturally distinct parts (proximal (PP), distal (DsP), and deep (DeP) and a single, proximal aponeurosis (Ap) projecting into the MV. The PP spanned between the lateral epicondyle and proximal ulna; DsP between the Ap and proximal ulna, inferior to the PP; DeP between the elbow joint capsule and proximal ulna, deep to the PP and the DsP. Only the DsP of AN is attached to the superficial and deep surfaces of the Ap. FB length and physiological cross-sectional area (PCSA) were significantly ($p < 0.05$) different between parts. **CONCLUSIONS.** AN is partitioned into 3 parts based on muscle morphology and attachment sites. The PP had the longest mean FB length, indicating the greatest excursion capability. The DsP had the greatest PCSA, indicating that this part has the greatest relative force-generating capability. A comprehensive in vivo ultrasound protocol to determine how the 3 parts interact functionally can be developed from the results of the study.

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Anatomical Ignorance Resulting in Iatrogenic Causes of Human Morbidity.

INTRODUCTION. When analyzing the increasing prevalence of iatrogenesis plaguing the medical field, it is critical to examine the continuum of medical education, training, and practice that physicians must progress through during their career. A major change that has taken place over the last decade has been within anatomy education for medical students. There has been a shift away from cadaveric dissections with a preference for virtual dissections and augmented reality to compress the anatomy content within the shortened preclinical curriculum. **METHODS.** In order to review the current state of undergraduate medical anatomy education and the clinical implications of anatomical ignorance, a literature search was conducted. **SUMMARY.** This article presents examples from the literature search regarding iatrogenesis due to anatomical ignorance which included abscess formation and neuropathy as a result of improper intramuscular injections, superior gluteal nerve injuries due to surgical procedures, and misdiagnoses due to physicians' inability to examine and correlate clinical and radiological findings. **CONCLUSIONS.** As the landscape of medical education evolves, there should be an effort made to preserve the utilization of cadaveric dissection and thorough anatomy education, with an emphasis on utilizing multiple learning platforms. This would include, but is not limited to, dissection in gross anatomy lab, didactic lectures, virtual tools, and imaging which should include hands-on ultrasound. Sufficient time needs to be allocated to anatomy education during the preclinical phase to emphasize that the eventual physician be able to perform thorough and meaningful physical examination, symptom and radiological interpretation, minimize misdiagnoses, and provide efficient treatment strategies.

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Students' Perspectives on Diversity and Inclusion in Anatomy Curricula.

INTRODUCTION. Health professional students exposed to diversity topics within the curriculum are provided an opportunity to become more sensitive to characteristics that differ from their own and increase their knowledge and confidence in treating patients from all communities. Since students are typically enrolled in gross anatomy courses the first semester of their first year, anatomy provides an ideal place within the curriculum to begin this exposure. Additionally, anatomy course content naturally lends itself well to incorporating diverse points related to race, ethnicity, gender, etc. between populations. Thus, the goal of this project was to determine students' perspectives on diversity and inclusion in anatomy curricula and whether they feel adequately represented in their courses. METHODS. A voluntary survey was deployed to health professional students currently enrolled in, or having recently completed, a gross anatomy course. Quantitative and qualitative data were evaluated using appropriate statistical tests and thematic analysis, respectively. SUMMARY. The survey was completed by 186 students, representing dental, medical, physician assistant, occupational therapy, physical therapy, and masters of anatomy programs. An overwhelming majority of students (70.5%) felt incorporating diversity into anatomy curricula was very or fairly important, 20.2% felt neutral, and only 9.2% felt the incorporation was slightly or not at all important. Students were also evaluated on whether they felt their race, ethnicity, and gender were represented in their anatomy course. Non-white students were significantly more likely to feel their race and ethnicity were not represented in the anatomy curriculum compared to white students ($p < 0.001$, $p < 0.001$; respectively). CONCLUSIONS. This study suggests that the majority of students would support a purposeful and expansive incorporation of diverse anatomical teaching points into their anatomy curriculum. While doing so, an emphasis should be placed on creating a more inclusive environment for non-white students.

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Relationships Between Student Experience, Confidence, and Donor Connectedness in the Anatomy Lab.

INTRODUCTION. Gross anatomy lab experiences differ by student's preparedness and perceptions of their ability to confidently identify structures correctly. Student's connectedness with a donor as a possible representation of students' first patient experience was examined. First and second year medical students were surveyed. METHODS. Students (N=111) completed a survey to assess preparedness for anatomy lab and clinical clerkships, confidence in anatomy structure identification, application of anatomical knowledge, and feelings of connectedness to the anatomical donor. Interviews (N=3) allowed students to expand on their survey responses. SUMMARY. Students with previous anatomy lab experience had greater respect for and connection to their anatomical donor and were more likely to view their donor as their first patient. Students who completed the assigned pre-work and did well on team-based learning (TBL) examinations, had greater respect for their donor. Students with greater respect for their donor had greater confidence in identifying structures on other donors, in clinical scenarios, and in surgical cases. CONCLUSIONS. Students with stronger understanding of anatomy had greater confidence in clinical scenarios. Additional investigation is needed to understand the relationship between experience and connectedness with donors. Literature indicates that increased personalization of the donor also increased student connectedness. However, this study indicates that connectedness to the donor may also increase confidence with structure identification. It is possible that prior anatomy experience creates confidence that permits time and space for a donor connection, while students without a strong foundation focus more on the material. Future research will explore the directionality of this relationship and potential mediating factors such as the mediating role of confidence. The outcomes of those studies may inform anatomy lab faculty when designing curriculum.

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Minimally Invasive Denervation of the Wrist: A Cadaveric Study Using Ultrasound-Guidance.

INTRODUCTION. Wrist osteoarthritis poses significant challenges in pain management and functional impairment. Current surgical interventions often sacrifice wrist motion and entail long recovery times. Minimally invasive denervation offers a promising alternative by targeting sensory nerves. This study investigates the safety and efficacy of ultrasound-guided chemical ablation with phenol-glycerin for wrist denervation. **METHODS.** Three unembalmed cadaveric specimens were meticulously examined for wrist joint integrity. Musculoskeletal sonography was conducted using Sonosite M-Turbo linear probe (SLAx) which has a bandwidth of 6 to 13MHz for the assessment of musculoskeletal structures including nerves and vessels. A 22-gauge needle with 1% methylene blue solution, 8% phenol in glycerol was inserted from medial to lateral proximal to Lister tubercle. Injection occurred on both side of the interosseus membrane. Dissection of the anterior and posterior compartment of the forearm were performed to identify and trace the posterior interosseous nerve (PIN) and anterior interosseous nerve (AIN). Data was tabulated and statistically analyzed for success rates and nerve coverage. **RESULTS.** Injection of methylene blue demonstrated successful dispersion posteriorly along the 4th extensor compartment of the wrist and anteriorly between the interosseus membrane and pronator quadratus muscle. Importantly, this diffusion spared the main motor branches of the PIN and AIN nerves. **CONCLUSIONS.** Minimally invasive denervation of the wrist using ultrasound-guided chemical ablation with phenol-glycerin shows promise in providing targeting the sensory branches of AIN and PIN. Further validation of this technique could offer preemptive management of wrist pain and streamline clinical procedures, presenting a significant advancement in the treatment of end-stage wrist osteoarthritis.

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Anatomical Model-Based Videos: An Effective Learning Resource that Reduces Student Stress.

INTRODUCTION. The use of anatomical models in medical education is ubiquitous and can provide an efficient resource to medical students as they begin undergraduate medical education. This study aimed to utilize anatomical models to deliver concise instructional videos covering anatomy, embryology, and related clinical correlates that the students can watch to aid in exam preparation. **METHODS.** In this study, relevant anatomical models were used to make short instructional videos (an average duration of 8.5 minutes). Over the 10-week course of Anatomy, Histology, and Embryology (AHE) block, a total of 10 videos were distributed to the students. Each video was accompanied by pre-and post-quiz questions covering similar topics and difficulty levels. These quizzes assessed student knowledge and evaluated content delivery. Additionally, qualitative questions were distributed with each video to discern if the students thought the videos were useful and helped to reduce stress during exam preparation. **SUMMARY.** In an end-of-block survey, 93.3% (n=30) of responding students "agree" or "strongly agree" that this resource helped to reduce general stress during the AHE block. Additionally, students (n=188) ranked these videos the 6th (out of 21) most effective learning resource available to them. After watching the videos, student post-test scores improved significantly in all units as compared to the pre-quiz scores. For example, unit 1 score averages increased from 75.6% to 80% correct (P value < 0.0001) and unit 2 averages increased from 75% to 86.5% correct (P value < 0.0001). **CONCLUSIONS.** Students found the instructional videos to be an effective study tool and at the same time reduced student stress during the AHE block. The feedback received from students was overwhelmingly positive, with many expressing their desire for additional videos to be created to accompany the current ones. (Work on this project was covered under QIRB #22069.)

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Effectiveness of 3D Printing in Pre-Operative Planning in Patients with Congenital Heart Disease.

INTRODUCTION. Congenital heart diseases (CHD) are structural heart anomalies presenting a spectrum of anatomical complexities, often posing challenges during open heart surgeries. Current pre-operative planning relies heavily on surgeons' experience and medical imaging, limiting precision. This study aims to assess the effectiveness of 3D printing in pre-operative planning for CHD patients, aiming to mitigate surgical risks and enhance patient outcomes. **METHODS.** 3D heart models were fabricated from anonymized CT scans and MRI files of two CHD patients. These models varied in size, material, and anatomical representation. **SUMMARY.** Analysis utilizing the Likert scale revealed positive feedback in three key areas: Preoperative communication and planning (77% usefulness), Risk aversion (70% usefulness), and Preoperative efficiency (64% usefulness). **CONCLUSIONS.** Our findings support the utility of cost-effective 3D printing utilizing CT and MRI data in augmenting preoperative planning and team education. This approach has the potential to minimize errors by providing surgeons with patient-specific, tactile heart models for enhanced procedural visualization and planning. Addressing existing limitations will further solidify 3D printing's role as a valuable surgical planning tool.

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Muscularization of the Chordae Tendineae of the Left Anterior Papillary Muscle.

INTRODUCTION. Cardiac valve function is integral not only to cardiac health but also overall cardiovascular health. While these valves have many supporting factors, the chordae tendineae, described as fibro-collagenous structures, support the leaflets of the atrioventricular valves of the heart in various ways. The avascular chordae tendineae are composed of collagen and elastic fibers and function as anchor points between the papillary muscles and the valve leaflets. They connect to the ventricular side of the free border of the valve leaflets and serve to hinder the leaflets from swinging back into the atrial cavity during systole. Mitral valve chordae tendineae have been classified using a variety of classification systems. **RESOURCES.** We report on a case of variant chordae tendineae not previously described in the literature. The variant, present only on the left anterior papillary muscle, did not show the expected chord like appearance but rather more closely resembled an extension of the papillary muscle toward the valve leaflet. Muscular fibers were observed extending from a larger than usual left anterior papillary muscle inserting onto the rough zone of the anterior leaflet. Several tendinous primary and secondary true leaflet chordae can be seen emerging from the apical portion of the anterior papillary muscle, inserting into the free edge and rough zone of the anterior leaflet. **DESCRIPTION.** During routine prosection of adult human hearts for teaching purposes in the Gross Anatomy lab, a unique variation of the chordae tendineae not previously described in the literature was observed. **SIGNIFICANCE.** Defects in the functionality of any part of the mitral valve apparatus can lead to rapid and permanent ventricular dysfunction. The muscular nature of the observed chorda in this case may not be adapted to be able to withstand the ongoing ventricular forces. Additionally, muscular contraction of this chorda during systole could lead to clinically significant obstruction to ventricular blood flow. The developmental connection between the chordae and papillary muscles could explain the anomalous muscularization of the chordae tendineae observed in this case.

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Bilateral Variations in Pronator Teres and Neurovasculature in the Upper Limb: A Case Study.

INTRODUCTION. Patients who present with various clinical signs and symptoms need to be thoroughly investigated with anatomic variations in mind to prevent misdiagnosis. Most nerve variations are related to their formation or their course and are frequently associated with variability of structures that surround them such as blood vessels, ligaments, and muscles. A knowledge of variations will aid in accurate diagnosis, and if surgical intervention is warranted, such awareness would minimize intraoperative errors. **RESOURCES.** During dissection of 11 cadaveric specimens, an elderly female cadaver exhibited bilateral variations in the origin of pronator teres associated with brachial artery and median nerve. **DESCRIPTION.** In this case study, it was observed that the humeral head of the pronator teres muscle originated at mid humerus level bilaterally, associated with the passage of the median nerve and ulnar artery posterior to it. This muscle was 19cms in length bilaterally, approximately 5.5cms longer than the average lengths of pronator teres measured bilaterally in the other cadavers. Due to its high origin the median nerve travelled posterior to into the forearm, by-passing the cubital fossa. Although the ulnar heads origin was normal, the median nerve failed to pass between the two heads of the pronator teres. The brachial artery was observed to divide in mid humerus level into radial and ulnar arteries. The radial artery replaced brachial artery in the antecubital fossa and ulnar artery accompanied median nerve posterior to pronator teres into the forearm. **SIGNIFICANCE.** Knowledge of such variations can be very profound for physicians, as this region involves significance in creation of arterio-venous fistulas, surgical treatment options for supracondylar and radial head fractures, and to differentiate and treat symptoms of median nerve compression in pronator teres syndrome versus carpal tunnel syndrome.

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Unusual Origin of the Common Hepatic Artery: Anatomical Description and Clinical Implications.

INTRODUCTION. The trifurcation (the common hepatic artery–CHA, left gastric artery–LGA, and splenic artery–SA) of the celiac trunk (CT, Type I classification) has a reported incidence of 75% to 90%. We present a variant wherein the CHA and Superior Mesenteric Artery (SMA) arise from a single stem, termed a “Hepatomesenteric Trunk” (HMT). **RESOURCES.** Between August and December 2023, 28 formaldehyde donors were dissected in the anatomy course for second-year medical and PA students. **DESCRIPTION.** In an 85-year-old female, the CT was found to bifurcate into only two branches: the LGA and SA. Inferior to this “gastrosplenic trunk” was the pancreas, behind which coursed the SMA. A sagittal cut of the pancreatic body allowed for the identification of a vessel ascending towards the liver; further dissection revealed a clear HMT (1.6 cm), giving rise to the CHA and SMA. The CHA ascended posteriorly to the pancreas and traveled medially to the superior mesenteric vein, then turned anterior to the portal vein, giving rise to the gastroduodenal artery (GDA) and right gastric artery. We did not identify an inferior contribution to the GDA from the SMA. The pancreas was 9.5 cm in length, 1.8 cm in height, and 1 cm in thickness. The cystic artery and right and left hepatic arteries were identified in the superior part of the CHA. A 3D-printed model will be presented. **SIGNIFICANCE.** There are numerous anatomical variants of foregut vasculature. In this donor, we described the origin and course of the HMT variant (IX-Michels, or V-Hiatt). Out of 28 donors, we identified 1 HMT. Knowledge of abdominal arterial variants will support surgeons and interventional radiologists in performing surgical procedures such as liver transplantation, aortic aneurysm repair, pancreaticoduodenectomy, mesenteric revascularization, cancer surgery, and infusion chemotherapy while avoiding life-threatening complications.

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Exploring Curiosities: Queries and Observations of Medical Students in the Anatomy Dissection Room.

INTRODUCTION. After overcoming the initial intimidation of the dissection room environment, medical students bring forth thought-provoking queries to faculty. These questions provide an opportunity to introduce snippets of medical humanities, narration, and tolerance level training. RESOURCES. Within the anatomical sciences department, faculty members were tasked with compiling a comprehensive list of recurrent questions and observations from students over the years. The selected inquiries formed the basis for further educational deliberations. DESCRIPTION. The compiled list unveiled diverse curiosities, including observations of the size of male and female reproductive organs, differences in lung size and appearance, and the functionality of perineal muscles. Additionally, there was notable frustration that the cadaver's anatomy did not always align with what the atlas showed. These observations and queries function as anchors to elicit discussions. There are also opportunities to provide a short life story of a researcher related to an eponym adding a personal touch to the exploration. A desired but usually unavailable narrative along with the cadaver can be used to demonstrate the reality one has to deal with, as findings in the body are often unpredictable, as will be experienced later in their medical studies, setting the stage for tolerance training. SIGNIFICANCE. The study identified a set of intriguing questions from students in the dissection room, that served as opportunities to elevate the educational experience through the introduction of aspects of medical humanities, and narration. This approach also injected life into otherwise routine sessions contributing to an overall vibrancy of the learning environment. The recognition of discrepancies further played a role in fostering tolerance.

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*SUMMERS, Gillian L., Alia TAQI, Lyndsay MM. SIMMONS, Drew A. BEDNAR, Bruce C. WAINMAN and Yasmeen A. MEZIL. Faculty of Health Sciences, McMaster University, Hamilton, ON, L8S 4L8, Canada; Medical Radiation Sciences, Centre for Integrated and Advanced Medical Imaging, Mohawk-McMaster Institute for Applied Health Sciences, Hamilton, ON, L8S 4L8, Canada; Hamilton Health Sciences, Hamilton, ON, L8P 1H1, Canada.

A Clinical Story; the Correlation between the Sublaminar Ridge and Spinal Stenosis.

INTRODUCTION. The sublaminar ridge (SLR), the insertion point of the ligament flava of the lumbar spine, may hypertrophy with age thereby resulting in adverse clinical outcomes. Imaging of the SLR can be used to inform pre-surgical planning and guide the use of appropriate surgical techniques. This study aims to retrospectively explore correlations between pre-surgical image findings of the SLR and clinical outcomes of spinal decompression surgery. METHODS. A retrospective analysis of clinical outcomes following spinal decompression was carried out using the electronic health records (EHR) system, EPIC, Picture Archiving and Communication System (PACS, Centricity RA1000), at Hamilton Health Sciences. A review of post-surgical spinal decompression records with a cross reference to pre-surgical cross-sectional imaging was analyzed. Demographic data including sex, age and pre-existing health status when applicable will be collected to appreciate confounding factors. This study is approved by the Hamilton Research Integrated Ethics Board (HiREB, Project 16969). SUMMARY. 12 patients who have undergone decompression surgery, comprising of 5 males and 7 females with ages ranging from 31-88 years, were identified as potential candidates for this study. The next steps are to retrospectively analyze cross-sectional imaging data sets to determine the presence of hypertrophied SLRs. Following this analysis, a clinical correlation of SLR status and post-surgical outcomes will be examined. Additional correlations between sex, age, pre-existing health status and spinal stenosis surgery outcomes may be identified. CONCLUSIONS. Discrepancies between successful and poor surgical outcomes of decompression surgery emphasize the need for assessing the SLR status. This study introduces a novel method to identify the SLR's presence in the lateral recess on pre-surgical imaging scans, which can provide critical input when planning for decompression surgery.

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Incidental Findings During Cadaver Dissection: Opportunities for Case-Based Teaching and Learning.

INTRODUCTION. Trainees in medicine and allied health professions are exposed to a vast amount of information during active human dissection. This challenging and sometimes tedious endeavor is often enriched by the incidental discovery of evidence pointing to aberrant anatomy, interventional procedures, or surgical installation of prosthetic devices. The purpose of this study is to highlight the importance of teaching anatomy in a clinical context and with a willingness to exploit intriguing, but unanticipated, findings. **RESOURCES.** Reported here is the discovery by first-year medical students of a metal plate implanted on the anterior aspect of the cervical vertebral bodies. The student team, which was one of 32, recorded this observation while conducting a proscribed bisection of the head. The subject was an approximately 80-year-old female cadaver donor. **DESCRIPTION.** In consultation with the anatomy faculty and a neurosurgeon, the students confirmed that the metal plate was a standard anterior cervical discectomy and fusion (ACDF) plate implanted to stabilize the cervical vertebral spine. This incidental finding provided an opportunity for the anatomy instructors to explain the importance of knowing the anatomy of the neck and the relation of the device to the surrounding structures. Moreover, it was an opportunity for students to independently investigate the surgical indications and anatomical approaches. **SIGNIFICANCE.** Dissection during academic training is a uniquely beneficial opportunity for experiential learning, especially in the context of teaching laboratories that support multiple concurrent teams of learners that likely will encounter multiple clinically relevant findings. The reported observation is exemplary of incidental findings that stimulate curiosity and motivate deeper and more thoughtful investigation and learning of the associated anatomy. It requires informed instructional flexibility and contrasts to the use of commercial specimens.

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*TABIRA, Yoko¹, Keishiro KIKUCHI¹, Aya HAN¹, Joe IWANAGA^{1,2,3}, Tatsuya HARANO¹, Keigo SHIMIZU¹, Tsuyoshi SAGA⁴, Koh-ichi YAMAKI¹, and Koichi WATANABE¹. ¹Department of Anatomy, Kurume University School of Medicine, Fukuoka, 8300011, Japan; ²Department of Neurosurgery, Tulane University School of Medicine, New Orleans, LA, 70112, USA; ³Department of Oral and Maxillofacial Anatomy, Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University, Tokyo, 1138519, Japan; ⁴Domain of Anatomy, Kurume University School of Nursing, Fukuoka, 8300003, Japan. Anatomical Studies for Understanding the Soleal Vein which is Susceptible to Deep Vein Thrombosis.

INTRODUCTION. The high incidence of deep vein thrombosis (DVT) in evacuees has been recognized since the 2004 Niigata-Cyuetsu Earthquake in Japan. We hypothesized that the number and location of traffic branches of the soleal veins may influence thrombus development and that the sagittal rotator cuff of the soleus muscle is the structure that influences the venous network of the soleal veins. Our aim was to investigate how the network of soleal veins varies with the shape and thickness of the sagittal rotator cuff and to elucidate the factors that predispose soleal veins to DVT. **METHODS.** The lower legs of 30 sides of formalin-preserved cadavers were observed. The central soleal vein is the predilection site for thrombus among the six veins within the soleus muscle and is divided into three branches: medial, central, and lateral. The soleus muscle has a unique architectural feature characterized by the presence of converging muscle fibers on the anterior surface of the median septum (sagittal sehnenblatt in German). The soleus muscle was dissected to examine the positional relationship between the central soleal vein and the median septum. **SUMMARY.** The central branch is located lateral to the median septum in 77% of cases. The branches of the central soleal vein had 2–3 communicating veins piercing the median septum of the soleus muscle. The morphology of the median septum may be straight or curved. The curved type has a communicating vein that penetrates the median septum. The central branch passed deeper in the curved type than in the straight type. **CONCLUSIONS.** The communicating veins may be restricted in their enlargement because of the morphology of the median septum. These events cause thrombosis through disturbance of the venous bloodflow. In disaster areas, ultrasonography of the soleal vein should be performed in addition to the 3-point compression method of focused ultrasound examination, which requires knowledge of the anatomical structure of the vein.

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*TARIQ, Minah, Morgan IRVIN, Megan STACEY, and Sara SLOAN. Department of Pathology and Anatomical Sciences, College of Osteopathic Medicine, Kansas City University, Kansas City, MO, 64116, USA.
Medical Cadavers in the Midwest: a Century's Worth of Post-Mortem Diagnoses.

INTRODUCTION. Medical students, both nationally and internationally, have been studying human anatomy via cadaveric dissection for centuries. Medical education typically begins with the dissection and studying of human cadavers. This experience teaches young medical students about ethical considerations in education and respect for one's patients. RESOURCES. The current project explores and discusses recently discovered gift body program ledgers from the Missouri Anatomical Society (MAS). These ledgers span over 100 years and have been used to document each cadaver's age, sex, and cause of death. These cadavers were either donated to the MAS by their families or were unclaimed bodies acquired from local morticians, who would then determine their cause of death. DESCRIPTION. The ledgers examined as part of this study act as a time capsule for medical education as each decade shows a pattern associated with the age and causes of death. Evaluation of the ledgers has allowed us to determine that the average age of cadavers studied in the Midwest steadily increased over the past century. This is reflective of the steady rise in age at death in the US. From the data collection, it was found that the average cadaver age during the 1910's was 44.25 years and during the 1990s the average age was 71.57 years, with a cumulative sample size of 3899 people. Analysis of the ledgers also shows how pathological characterization has changed over the years. For example, syphilis was documented under terms such as "locomotor ataxia" and "luetetic disease," and tuberculosis was documented as "phthisis" and "caseous lobar infection". SIGNIFICANCE. Ledgers associated with cadavers and willed body programs and societies provide a unique glimpse of the history of medical education and the students that eventually became physicians in their time. Further examination of ledgers such as these will not only provide more insight into the past but could also prove beneficial when developing curricula for current medical education.

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Bilateral Ectopic Submandibular Glands in the Carotid Triangles: Rare Anatomical Variation.

INTRODUCTION. Previous studies and reports have noted developmental variations of the submandibular glands (SMGs) such as the occurrence of accessory glands, heterotopic locations in neighboring tissues and aplasia or complete absence. Age-related positional change or descent (ptosis) of the SMGs, which could mimic displaced (ectopic) glands have also been reported. Such variations are of huge relevance to the differential diagnosis and management of neck mass. RESOURCES. Rare bilateral ectopic SMGs in the carotid triangles were identified during the dissection of the neck of a 77-year-old male donor who had observable bilateral submandibular and upper neck fullness. DESCRIPTION. SMGs with no superficial and deep parts were found bilaterally in the carotid triangles suspended from the floor of the mouth by their ducts and from the lingual nerve by branches to the glands. They were located inferior to the stylohyoid and posterior belly of digastric muscle, anteromedial to the carotid sheath and posterolateral to the superior belly of omohyoid muscle. Since no similar previous report related to this bilateral ectopic location of SMGs in the carotid triangles could be found in the literature, this report is the first of its kind to the author knowledge. SIGNIFICANCE. Such ectopic location of SMGs is noteworthy in aesthetic surgery, radiation therapy and in the surgical treatment of diseases such as Ludwig's angina where the decompression of submandibular space may be required. Therefore, the occurrence of unusual location of the SMGs like this, though rare, should be considered in the differential diagnosis of neck mass and in the decision-making process related to surgical approaches to the region. It is also worthy of attention, so that the risk of iatrogenic injury of the gland and structures in the vicinity (such as facial blood vessels, mandibular and cervical branches of facial nerve, lingual and hypoglossal nerves) can be avoided.

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Changes in Approaches to Anatomy Education: Impact of the COVID-19 Pandemic.

INTRODUCTION. COVID-19 provided a unique opportunity to implement innovative ideas in anatomical education. The purpose of this study is to investigate research trends in instruction in anatomy education before, during, and after the pandemic. RESOURCES. A narrative review was undertaken utilizing literature published in the "Anatomical Sciences Education" journal. Using PubMed as a database, abstracts published between 2018-2023 were included in the review. The most frequently occurring words within the retrieved abstracts were identified using a Python script. The context of their usage was analyzed to investigate the effect of the pandemic on anatomy education. DESCRIPTION. To identify trends in education research based on the most frequently occurring words and their context in anatomical teaching. This data was used to determine whether the COVID-19 pandemic itself was a catalyst event that accelerated the use of online technology in anatomy education. SIGNIFICANCE. During 2019, the research focused on different educational platforms and technological innovations that were already being trialed in classrooms as alternatives to maintaining expensive cadaver-based labs. Trends in discourse in 2020 and 2021 gauged student perspectives on the switch from in-person anatomical learning to modes of online learning, and its impact on learning outcomes and student grades. The years 2022 and 2023 showed a partial regress of online teaching with a greater emphasis on in-person teaching, while maintaining some aspects of virtual delivery of information. It can be summarized that the COVID-19 pandemic expedited the existing exploration of virtual and online mediums of instruction; however, feedback from students and educators has guided anatomy teaching towards a hybrid approach of in-person and online teaching.

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Morphology of the Masseter: Fibre Attachments to the Ramus, Temporalis Tendon and Coronoid Part.

INTRODUCTION. Modern anatomy depicts the masseter muscle with two layers: superficial and deep. But historical texts and a recent study suggest a third layer exists attached to the mandible's coronoid process. This study aims to investigate the masseter muscle and its muscle attachments. METHODS. Using the outside-in technique, masseters of 40 adult human cadavers (mean age: 86 years; range: 45-102 years) were dissected. Skin, subcutaneous fat and the masseteric fascia were removed, exposing the masseter, temporalis and zygomatic arch. The zygomatic arch was sawed at its anterior and posterior ends. The masseter muscle was finally reflected to reveal its deep fibres to investigate its attachments. SUMMARY. 68/72 (~94%) of the dissections reveal parallel muscle fibres running diagonally, originating from the posterior half of the posterior surface of the zygomatic arch, and inserting onto the mandible's coronoid process and the tendon of the temporalis muscle. Variations exist in the volume of fibres inserting onto the coronoid process and temporalis tendon. ~20-33% of fibres insert onto the coronoid process or temporalis tendon; the remaining fibres insert onto the lateral surface of the ramus. No fibres insert onto the borders of the coronoid process. The dissections also show muscle fibres originating from the inferior border of the zygomatic arch and inserting onto the lateral surface of the mandibular ramus. CONCLUSIONS. Based on our cadaveric study, there is muscle attachment from the posterior half of the posterior surface of the zygomatic arch to the mandible's coronoid process and temporalis tendon, as well as from the inferior border of the zygomatic arch to the lateral surface of the mandibular ramus. This data suggests confirmation of a third layer within the morphology of the masseter muscle. Clinically, this information could be used in further understanding the movement and control of the masseter in relation to jaw movement.

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Terms Associated with the Female Genital System in Histological Terminology - Proposed Suggestions.

INTRODUCTION. Terminology is an essential tool for communication and knowledge transfer. Each field in medicine uses its own terminology, which should also be “comprehensible” for experts from other fields in medicine and allied disciplines. This descriptive abstract aims to revise the terms associated with the female genital organs in the Terminologia Histologica (TH) from different points of view (e.g., clinical practice or routine anatomical education). All these activities are aimed at one goal: simple and unambiguous communication in our increasingly globalized world. **RESOURCES.** A systematic and in-depth analysis of the current TH was conducted. The analyses focused on finding missing or controversial terms and not unambiguous terms related to tissue structures associated with the female genital system, as well as less often used eponymous terms. We also discuss the significance of our findings for everyday practice and communication among anatomists and clinicians. **DESCRIPTION.** The authors identified 6 controversial and ambiguous terms and 4 missing important histological terms. The authors also discussed the addition of less used eponymic terms in the histological description of female genital organs like Hamperl cells, Popescu cells, Kroemer lacunas, Balbiani bodies, Call-Exner bodies, the membrane of Slavianski, Nabothian cysts, or anogenital glands of van der Putte. **SIGNIFICANCE.** In the last revision of the TH, 4,547 terms were listed. Such terminology is variable and under constant change - it is a “living organism in development” that is supplemented and improved thanks to suggestions from scientists from all over the world. This study was supported by the grants from The Slovak Ministry of Education No. VEGA 1/0625/23 and VEGA 1/0347/24. The first author is currently the coordinator of the Histology working group under the FIPAT. This abstract offers only the viewpoint of the authors, and may not present the viewpoint of other experts of the IFAA.

POSTER SESSION 2 – WEDNESDAY, JUNE 19 FROM 10:45 AM - 11:45 AM

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Cadaveric Analysis of Eagle’s Syndrome Styloid Processes with Review of Clinical Implications.

INTRODUCTION. The temporal styloid process (SP) functions as an apparatus for proximal attachment of the stylohyoid, stylopharyngeus, and styloglossus muscles as well as the stylohyoid and stylomandibular ligaments – all of which contribute to coordination of the hyoid, tongue, larynx, pharynx, and mandible. Typical SPs measure 20-25 mm in length, whereas those measuring ≥ 30 mm are uncharacteristic and indicate Eagle’s Syndrome. SP dimensions can be identified with plain film radiography and computed tomography, but the etiologies of Eagle’s Syndrome cases often remain unclear. This study seeks to determine the etiology of a case of Eagle’s Syndrome by analyzing bilateral elongated SPs in a human cadaver. **RESOURCES.** The present case was discovered during routine academic dissection. The contiguous anatomy was examined for any irregularities, and the SPs were stripped of extraneous tissue and photographed. Linear and angular dimensions of the SPs were measured, and a comprehensive outline of SP development, Eagle’s Syndrome diagnostic parameters, and functional impacts of elongated SPs was compiled from current literature. **DESCRIPTION.** The long axes of the right and left SPs measured 41.4 mm and 33.0 mm, respectively, and the proximal, middle, and distal SP diameters averaged 4.2 mm, 3.5 mm, and 1.7 mm, respectively. Both SPs exhibited a mid-shaft tubercle, after which they decreased diameter by over 25% within 2 mm of distance, increased angle of descent by more than 20.0° in the sagittal plane, and exhibited noticeably different surface characteristics, suggesting that elongation occurred via ossification of the stylohyoid ligament. **SIGNIFICANCE.** Irregularly elongated and angled SPs are known to cause difficulty swallowing, pain with neck movement, dissection of the internal carotid artery, and stroke. This report may inform medical educators, patients, and healthcare providers about the clinical anatomy, symptoms, etiologies, and implications of Eagle’s Syndrome.

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Faculty Rounds During Dissection Lab: Impact on Student Dissection Experience

INTRODUCTION. Faculty rounds are an integral part of clinical workflow in hospitals. These rounds provide an opportunity to monitor patient progress, review medical decision making, and serve as a teaching / learning opportunity for the healthcare team. RESOURCES. All faculty members in our required first year Anatomy course for MD and PA students are clinicians (active currently or in prior years). Based on their experience with faculty rounds in hospitals, a modified format was developed appropriate for dissection sessions. This included the number of faculty members rounding during each lab session, suggested questions to ask, list of observations to make during rounds, and a rubric for awarding points to each team. DESCRIPTION. By rotation, two faculty members completed one cycle of rounding during each lab session. Each faculty round evaluated half of the tables in the lab, and it assessed the work done in the prior two lab sessions. Since our course includes two lab sessions in a week, every table was evaluated once a week throughout the course. We evaluated the impact of introducing faculty rounds for dissection lab sessions and analyzed end-of-course student feedback to assess student views on faculty rounds. SIGNIFICANCE. Faculty rounds afford an opportunity for course faculty to evaluate dissection work and team dynamics at each table in a formal and structured manner. It is a convenient way for students to receive near real-time formative feedback on their individual and team performance in lab. Introducing faculty rounds in an Anatomy dissection course is an easy and a low stakes method to familiarize healthcare students to a common clinical workflow activity in hospitals which they are likely to experience in future years.

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Biomechanical Modelling of the Eye with an Artificial Intraocular Lens under Different Conditions.

INTRODUCTION. The stability of the eye's optical system is a prerequisite for correct vision, both in the intact eye and in an eye that has undergone surgery for a variety of reasons, ranging from the treatment of degenerative diseases to trauma. The anatomical structures involved in vision are very fragile and susceptible to damage from various types of trauma, from superficial foreign body abrasions to penetrating traumatic injuries. Mathematical modelling followed by biomechanical analysis can show the distribution of stresses and strains, i.e. the degree of mechanical loading, and identify the most overstressed structures or parts of structures that may lead to failure. These numerical models are already routinely used in medicine. The aim of this work was, firstly, to improve the existing biomechanical model of the eye by implementing additional structures that influence the response to mechanical loading, e.g. during traumatic events, including the implementation of an artificial intraocular lens. Secondly, to simulate loads of different degrees and intensities on the improved model. RESOURCES. The source data has been obtained from a search of the literature and from our own observations. DESCRIPTION. The Finite Element Method (FEM) analysis was carried out as a numerical simulation using the Abaqus programme. Simulations on mathematical models showed the loading of individual structures of the eye under physiological conditions and during a blunt impact. They showed the structures at risk and the locus minoris resistentiae both for damage in the physiological state and for altered conditions after surgery. SIGNIFICANCE. Modelling structures and their loads in the human body helps to select the best surgical approaches and also to improve the materials, shape and placement of implants so that the resulting dynamic systems are as stable as possible in terms of function and can withstand possible traumatic events. (Sponsored by Grant No. INT/2023/0010).

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An Accessory Coracobrachialis & Bilateral Aponeurotic Expansion of the Short Head of Biceps Brachii.

INTRODUCTION. The coracobrachialis (CBm), biceps brachii (BBm) and brachialis (Bm) constitute the flexor muscles of the arm. The CBm, not usually considered as being very subject to variation, originates from the coracoid process and inserts onto the middle third of the humerus. This case reports the presence of a left accessory head of the CBm and a bilateral aponeurotic expansion of the short heads of the BBm. **RESOURCES.** Bilateral dissection of the upper limbs of an embalmed 80 y/o female Caucasian donor was performed. Documentation of findings and photographs are noted. **DESCRIPTION.** We identified the presence of a left accessory CBm that originated from the anterior surface of the left glenohumeral joint capsule (GHJC) with which it blended, just below the lesser tubercle and lateral to the insertion of the subscapularis muscle. It then coursed infero-medially between the short & long head of BBm and inserted together with the CBm onto the anteromedial middle third of the left humeral shaft. It was innervated by the musculocutaneous nerve and measured 107.77mm in length and 21.85mm in width. Additionally, there was a bilateral, superolateral expansion of the external aponeurotic sheath of the short head of the BBm that spanned across the anterior aspect of the GHJC, over the tendon of the long head of the BBm forming a tunnel across it. The expansion inserted laterally into the deep surface of the pectoralis major and anterior belly of the deltoid muscles. The aponeurotic measurements on the left side- 35.21mm in length by 44.61mm in width and on the right side- 53.22mm in length by 41.76mm in width. **SIGNIFICANCE.** Understanding the possible anatomical variations of the CBm and BBm is fundamental to achieve superior management and surgical approach of the shoulder region. Knowledge of the alteration of forces transmitted across the GHJC is essential to avoid pain and prevent wear and tear of the GHJC.

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3D Reconstruction and Morphometric Analysis of Lumbar Vertebrae: A Pilot Feasibility Study.

INTRODUCTION. Fluoroscopy guided lumbar medial branch radiofrequency ablation is commonly used to relieve facetogenic lower back pain. Traditionally, a parallel technique using a 20-degree needle angle away from the sagittal plane is used to target the nerve. In recent studies a more parasagittal needle angle has been shown to have positive outcomes. Therefore, it has been suggested that needle angles (traditional or parasagittal) should be determined based on patient-specific anatomy. To elucidate the appropriate angle, a more comprehensive understanding of the relationship between 3D bony lumbar vertebral anatomy and 2D fluoroscopic features is required. Thus, the objective of this pilot study was to assess the feasibility of using a laser scanning methodology to model 3D bony lumbar anatomy and to subsequently simulate 2D features visible with fluoroscopy. **METHODS.** Two lumbar vertebrae, one with optimal geometry for a traditional needle approach (traditional vertebra) and another for a parasagittal technique (parasagittal vertebra), were photographed and digitized using a Faro Laser ScanArm. Each vertebra was reconstructed in 3D to create high-fidelity models. The models were imported into Blender3D. Using custom plugins, fluoroscopic images were simulated. The 3D models were then compared to identify key geometric differences. **SUMMARY.** Comparison of the traditional vs parasagittal vertebrae showed a notable difference in the shape of the mammillary process (MP). From a posterior view, the MP of the traditional vertebra protruded more laterally. From a posterolateral view, the lateral/inferior contour of the MP had a hook shaped appearance in the traditional vertebra whereas the parasagittal vertebra had a smooth curve. **CONCLUSIONS.** This pilot study suggests that laser scanning methodology can reliably model 3D bony vertebral anatomy which can then be used to examine 2D fluoroscopic features. Future research is required to increase sample size and assess consistency of observed geometric differences.

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Measuring Domains of Team Effectiveness in the Medical Gross Anatomy Laboratory Experience.

INTRODUCTION. Teamwork is integral in the practice of medicine, requiring collaboration to meet the common goal of providing safe, high quality patient care. Undergraduate medical education incorporates opportunities for medical students to navigate the various domains of teamwork but there is limited literature focused on assessment of teamwork and interventions that may be helpful. The present study proposes using the medical gross anatomy laboratory as a setting in the preclinical curriculum to measure team effectiveness over time. METHODS. In the fall of 2023, first year medical students (N=90) answered a series of questions at midterm and at the end of the course regarding their 3-member dissection team's effectiveness, measured by an adapted version of the "Team Effectiveness Diagnostic," created by London Leadership Academy, National Health Service. This diagnostic examines 8 domains of team effectiveness on a 5-point scale, including purposes and goals, roles, team processes, team relationships, intergroup relations, problem solving, passion and commitment, and skills and learning. An alpha of 0.05 was set and used for analysis of p-values and statistical significance. SUMMARY. Using a two tailed paired t test, significant growth in the composite team effectiveness score ($p=0.04$) was observed from midterm ($M=4.75$, $SD=0.34$) to end of term ($M=4.83$, $SD=0.29$). The greatest gains were observed in team processes ($p=0.000009$), roles ($p=0.0001$), and team relationships ($p=0.0002$). The least gains were observed in purposes and goals ($p=0.014$), skills and learning ($p=0.013$), and passion and commitment ($p=0.007$). CONCLUSIONS. While significant improvement was observed in each of the 8 domains of team effectiveness in this study, there is opportunity for an even more profound impact with the introduction of interventions such as team development exercises, coaching, and feedback. Student knowledge of and self-reflection on their dissection team's effectiveness provides meaningful opportunities for academic and personal growth and awareness.

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Interrater Reliability of the Critical Appraisal Tool for Anatomical Meta-Analysis.

INTRODUCTION. The hallmark of evidence-based anatomy (EBA) is the anatomical meta-analysis (AMA). The Critical Appraisal Tool for Anatomical Meta-Analysis (CATAM) was recently published to enable users to appraise AMAs quickly and effectively. The tool is valuable for students and clinicians who need to judge the quality of AMAs, which informs clinical decision making and results in better patient care. This study investigated the interrater reliability (IRR) of the CATAM globally, and between novice and expert raters. METHODS. Three graduate students and three professors (two anatomists and one pharmacist) read the original CATAM paper, and then had a post hoc meeting to discuss scoring with the tool. Three recent AMAs (published between 2017-2022) were randomly chosen from PubMed, and all six raters scored the papers blindly. The intraclass correlation coefficient (ICC) statistic was used to calculate the interrater reliability (IRR) between all scores, and then the ICCs between novice and expert scores were compared. Cronbach's alpha (internal consistency) of the CATAM was also calculated (SPSS 25, Armonk, NY). SUMMARY. ICC for AMA-1 was .999 (95% CI, .997-.999), $p=.000$, and alpha was .999. ICC for AMA-2 was .994 (95% CI, .988-.998), $p=.000$, and alpha was .994. ICC for AMA-3 was .998 (95% CI, .995-.999), $p=.000$, and alpha was .998. ANOVA showed no significant differences ($p>.05$) in mean ICCs between raters. CONCLUSIONS. The CATAM is a robust tool with excellent IRR ($ICC>.990$) and internal consistency ($alpha>.990$). No significant difference in ICC scores between novices and experts suggests the tool does not require prior expert knowledge to be effective. Now that the reliability of the CATAM is established, it can be more widely adopted by students and physicians worldwide to evaluate the quality of AMAs. The CATAM can also be used as a tool to help students hone their skills in EBA.

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Measuring Domains of Professionalism, Teamwork, and Communication in the Dental Gross Anatomy Lab.

INTRODUCTION. Many of the core Commission on Dental Accreditation (CODA) standards focus on competencies for communication, inter-professional teams, and professionalism. The gross anatomy lab serves as an early and advantageous curricular setting for first-year dental students to not only assess their own status and development with these competencies, but to also provide feedback for peers. However, the hours provided for anatomy lab has decreased over the years which diminishes the opportunities to observe and reflect on self-growth casually. This study aimed to provide a method and assessment of student progress within these competencies over a short ten-week course. **METHODS.** First-year dental students completed self-assessments (start, middle, and end) and peer-assessments (middle and end) regarding the domains of Professionalism, Teamwork, and Communication within a head and neck anatomy course. Assessments included five Likert scale questions and one open-ended prompt for goal making, progress, or feedback for each domain. Likert scale questions were analyzed utilizing SPSS and open-ended prompts analyzed by qualitative thematic analysis with grounded theory. **SUMMARY.** Overall growth in professionalism, teamwork, and communication was observed from beginning to midterm to end for self-assessments and midterm to end for peer-assessments. Thematic analysis of student goals and peer feedback were focused on preparedness, accountability, and efficiency for Professionalism, engagement and collaboration for Teamwork, and minimal interruptions and active listening for Communication. **CONCLUSIONS.** First-year dental students demonstrated self- and peer-perceived growth in the domains of Professionalism, Teamwork, and Communication even in a compressed ten-week gross anatomy lab setting. These findings support the use of these assessments in the gross anatomy lab for student, faculty, and administration awareness and documentation of progress within these competencies.

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Re-discovery of Congenital Subclavian Steal: A Case Report of an Exceptional Educational Opportunity.

INTRODUCTION. Subclavian steal syndrome (SSS) results from narrowing of the subclavian artery proximal to the origin of the vertebral artery. The condition is usually acquired secondary to atherosclerosis but may present congenitally. It is characterized by retrograde flow in the ipsilateral vertebral artery, in effect “stealing” blood from the brain and causing vertebrobasilar insufficiency. **RESOURCES.** Anatomical evidence of SSS was observed in a 69-year-old female body donor who had died of respiratory arrest due to longstanding COPD. The condition had been recognized and treated surgically during the donor’s lifetime. **DESCRIPTION.** The right subclavian and both common carotid arteries arose in typical fashion from the brachiocephalic trunk and aortic arch. The left subclavian artery was extremely narrow in its proximal segment. A synthetic graft connected the left common carotid to the left subclavian, bypassing the stenotic segment. Sectioning of the subclavian artery revealed a narrow lumen with no evidence of atherosclerosis. It is therefore inferred that this was a rare case of congenital subclavian steal that was diagnosed and treated during the donor’s lifetime, unknown to faculty at the time of body donation, and subsequently re-discovered during dissection. **SIGNIFICANCE.** This case represents a rare educational opportunity to demonstrate the normal, abnormal, and interventional anatomy of a clinical syndrome in a single dissection. Unlike absent viscera (e.g., gallbladder, uterus, appendix) and closures that stand as evidence of prior surgery, this case allows side-by-side comparison of expected structure with anatomy that has been altered by both development and intervention. There are few hints to these underlying elements of a donor’s medical and surgical history, but such cases create “teachable moments” when they are found. If practical and ethical, preserving these cases as dissections can provide unique insights for future learners.

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An Unusual Morphologic Finding in the Anterior Jugular Vein in Congestive Heart Failure.

INTRODUCTION. Anatomical variations of the anterior jugular vein have been documented, but the characterizations of these veins are limited. Assessing the anterior neck for structures that may obstruct the surgeon's access to cervical structures is critical to patient safety. Limited studies have described a midline, single anterior jugular vein. This case report aims to bolster current knowledge of the variations in the anterior jugular veins. RESOURCES. One human cadaveric subject was obtained from the Gift Body Donor program. Measurements were taken using a digital caliper to assess lumen circumference and diameter. Images were taken of the anterior jugular vein for descriptive value. DESCRIPTION. In this case report, a 95-year-old male donor with congestive heart failure presented an enlarged, single anterior jugular vein. Previous documentation of a single anterior jugular vein variation has been noted, but none have described a midline variation. SIGNIFICANCE. Percutaneous cricothyrotomies and thyroidectomies are common procedures that require extensive anatomical knowledge of the head and neck along with their vascular patterns. This case showing the rare morphology of the anterior jugular vein may suggest further considerations during pre-operative care to avoid iatrogenic injury of patients who may have similar anatomical variations within the anterior cervical region, particularly those with congestive heart failure.

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An Efficient Injection Techniques for Minimally Invasive Treatment in the Forehead and Temple Area.

INTRODUCTION. The aim of this study is to examine the variance between the current anesthesia technique and a novel injection method. This will be achieved by: 1) comparing the area and degree of anesthesia, 2) evaluating pain intensity using The Visual Analogue Scores (VAS), and 3) assessing the morphological anatomy of muscles using ultrasonography. METHODS. A split-face randomized study was done on 24 adult patients with no general conditions, and no history of invasive / non-invasive treatment in the temporalis area within the past 6 months. Using ultrasonography, the zygomaticotemporal fossa and nerve were identified and their depths were measured. On one side, 0.9mL of lidocaine (1:100000 epi) was injected using the conventional technique, while on the other side, the same amount of lidocaine (1:100000 epi) was administered using the novel injection method. VAS scores were recorded for both sides. The extent of block anesthesia on the relevant fibers was assessed by testing responses to cold, pressure, and pain using ice, Weinstein filaments, and an explorer every 5 minutes for 30 minutes. Skin temperature was measured every 5 minutes for 30 minutes. SUMMARY. This study enrolled 24 patients, with an average age of 29.33 years and a BMI of 20.94. VAS scores were 2.35 (range 0-5) for the novel technique and 3.68 (range 1-6) for the conventional injection method. Generally, the level of pain was lower in the novel injection group, which became evident 30 minutes after injection. Touch sensation was lower in the conventional group compared to the novel group, but there was no significant difference. Cold sensation was also lower in the novel group, but again, there was no significant difference. The skin temperature changed from 35.4 before injection to 36.5 at 30 minutes after injection in the novel technique group, while in the conventional group, it changed from 36.1 to 36.57, showing no statistically significant difference. CONCLUSIONS. The novel technique for Zygomaticotemporal nerve (ZTn) injection exhibited significantly lower pain during injection and similar effects compared to the conventional technique. This novel approach could be considered for procedures requiring anesthesia in the temporal area. (Sponsored by Grant No. LTD(2023-31-0013) from the Yonsei Medical Center in conjunction with healux Co.)

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Histology Reinvented: Bridging Theory and Practice in Reproductive Workshops for Enhanced Learning.

INTRODUCTION. Histology education traditionally relies on microscopes and glass slides. However, modern learners thrive with more engaged resources, prompting educators to embrace hands-on learning approaches. During the reproductive system block at our institution, we initiated workshops to illustrate the relevance of histology through immersive learning. We hypothesize that supplementing traditional histology lectures with clinical practice and case-based learning will enhance student understanding of reproductive histology/histopathology and refine application skills. **METHODS.** Two selective workshops for second-year medical students were organized, each regarding either male or female reproductive organs. In the female workshop, students rotated among stations engaging in hands-on learning with manikins and ultrasound simulations. Two stations were lecture-based histology presentations with pathology. Post-session, students were provided with case studies and questions on reproductive disorders. The male workshop began with a lecture-based presentation on histology, pathologies, and ultrasound, followed by group collaboration on case studies. Of 173 medical students, 70% attended either one or both workshops. **SUMMARY.** In a post-block questionnaire, 66% of students (n=120) found the case-based approach highly effective in enhancing understanding of reproductive organ physiology/pathology. Furthermore, 78% of students felt competent in applying workshop-acquired knowledge to practical scenarios. An overwhelming 88% of students credited the workshops with improving their comprehension and application of clinical histology. Analysis of student performance on questions related to workshop topics revealed that students outperformed their counterparts (school-83%; national average-80%) when compared to questions derived from lecture content (school-61%; national average-71%) within the same block. **CONCLUSIONS.** The data strongly indicate that supplemental instruction, incorporating clinical skills practice, histology reinforcement, and case studies, enhances student understanding of reproductive physiology and pathology. The workshops' success underscores the potential for transformative teaching methods in histology education. QIRB#23057

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*IMMONEN, Jessica A., David PATTERSON, Nathan KENT, Samantha PIPKIN, Alyssa LUU, Jason CICCOTELLI, Linh M. NGUYEN, and Jeremy JAMES. School of Dental Medicine University of Nevada Las Vegas, Las Vegas, NV, 89106, USA. Biomechanics of Bruxism Determine the Sites of Severe TMJ Osteoarthritis.

INTRODUCTION. Temporomandibular joint (TMJ) disorders, including TMJ osteoarthritis (OA), are the second most common musculoskeletal condition and may affect 5-12% of the population. The objective of this study was to assess the OA disease severity in 47 temporomandibular joints using a validated scale for gross signs of OA while noting the specific sites for profound disease on the donor condyle and fossa. **METHODS.** A disease severity score of Grade 0-4, representing absent to severe disease, was awarded to each specimen's condyle and fossa by two blinded investigators who have demonstrated interrater reliability. Focal sites of potential bruxism biomechanics were further assessed on each component of the TMJ. **SUMMARY.** The mandibular fossa was more pathological compared to the mandibular condyle (*p=0.001). When the deepest focal lesions were qualitatively assessed it was demonstrated that the mandibular fossa was more severely degenerated than the articular eminence in 58% of donors. In this subpopulation, 74% of the severe mandibular fossa pathology was seen on the deep articular surface. When the articular eminence was the most severely degenerated region of the fossa, it was equivalently likely to see severe focal lesions on the lateral eminence (35%) or equally distributed across the entire eminence (35%). **CONCLUSIONS.** The greatest disease severity was discovered in sites of bruxism. Patients with bruxism produce significant translational movements (grinding) in the upper joint compartment and heavy vertical loading (clenching). Anatomical alignment of the condyle and mandibular fossa encourage OA manifestation on the lateral joint, this amplifies pressure and potentially inflammation on the lateral articular surfaces and in the deep fossa.

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Impact of Undergraduate Anatomy Experience on Dental School Anatomy Performance and Retention.

INTRODUCTION. The new Integrated National Board Dental Board Exam (INDBE) is challenged by dental students entering their final year of dental school training, which extends the timeline for students to remember material from didactic courses. We hypothesized that students electing to take undergraduate anatomy coursework may perform better in professional school anatomy. We aim to determine the impact on dental student pre-professional anatomy exposure on academic success, stress level, confidence in application, and long-term retention of anatomy knowledge. METHODS. Recruitment of students from each class for voluntary participation in a survey and retention assessment including both lower-level recall and high-level clinical integration questions. SUMMARY. There is significant association between grade earned in dental school anatomy and undergraduate training ($p=0.004$). 44% of experienced students received an 'A' in the course compared to only 21% of students without undergraduate training. The majority (40%) of inexperienced students received a 'C' in dental school anatomy. Qualitatively, 74% of experienced students reported increased confidence going into dental school anatomy; however, 46% of those students did not report decreased study time for dental school anatomy. Quantitatively, performance on the retention assessment was impacted by pre-dental anatomy completion only in the D1 cohort, who collectively scored significantly higher overall than both the D2 and D3 cohorts ($p<0.0001$) as well as in each tier of cognitive processing (lower, intermediate, and higher-level questions; $p<0.0001$). Within the D1 class, experienced students scored significantly higher than novices on each tier of questions, most notably in the 'higher level' questions (6.8 vs. 5.9; $p=0.045$). CONCLUSIONS. Collectively, these results suggest strongly recommending undergraduate anatomy training for students applying to dental school.

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Lessons through the Lens: Synchronous Video Enhanced Laboratory Instructional Approach for Anatomy.

INTRODUCTION. The authenticity of the human body donor as a model for teaching and learning will continue to surpass its digitally rendered reconstructions. A well-dissected donor with minimal disruption to tissue layers provides a versatile landscape for contextualizing anatomic relations and sets the stage for clinical discussion. Traditional laboratory instruction used in medical school and clinical training present barriers to effective high-quality visualization of anatomical structures. Suboptimal experience is associated with novice dissections that provide no guarantee of structural preservation, limitation of instructor's ability to draw student attention equally to area in focus and absence of a reiterative learning moment in the loose laboratory environment. This presentation outlines design, technical resources, and skills required for delivery of live video-enhanced cadaver laboratory transmissions based on 5-year experience with novice to expert learners. RESOURCES. Prosections (layered dissection), clinician and core teaching team, 2 digital content specialists, equipment: cameras (4k Overview, 4K handheld remote signal, presenter camera, 4k tripod, DSLR, 6K cinema, endoscopic cameras), 75" HD Screens, blue screen, switcher board, studio lighting, lavaliers, 2 laptops. DESCRIPTION. Department of Clinical Anatomy, Mayo Clinic uses synchronous video enhanced laboratory instruction for high yield orientation, multidimensional visualization, and creating a resource for student reiteration of learning moments. Instructional design is based on principles of documentary video creation that involves in tandem facilitation by anatomist, clinician, and videographer. SIGNIFICANCE. Presentation of anatomical information dictates a narrative that pivots around non-traditional orientation, instructor familiarity of anatomy from process of dissection, didactic alignment and instructor driven engagement with clinical specialist to reinforce anatomical competency.

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Prevalence of the Peroneus Tertius Muscle: A Comparative Study Across Genders and Ethnicities.

INTRODUCTION. The Peroneus Tertius Muscle (PTM) is a rare anatomical variant in the leg's anterior compartment, instrumental in foot eversion and dorsiflexion. Given its accessibility and minimal impact on leg function, PTM is frequently employed in tendon graft surgeries. Our study aims to assess the prevalence of the PTM tendon using palpation and ultrasonographic methods, investigating any disparities across gender and ethnic groups. **METHODS.** This study involved a cohort of 85 subjects (ages 18-30) for a total examination of 170 feet using palpation methods outlined by Tixa and Kendall, conducted by one examiner. A separate observer, blind to the palpation outcomes, performed ultrasonography using a GE LOGIQ system and a 12-15 Hz linear transducer positioned transversely at the proximal region of the fifth metatarsal. Ethnicity and gender data were obtained via questionnaires, with ethnicity categorized into White, South Asian (SA), Middle Eastern/North African (MENA), Sub-Saharan African (SSA), and Other, and gender classified as female and male. **SUMMARY.** The study found that bilateral PTM presence was more prevalent than unilateral, with ultrasonography detecting PTM in 86.8% of cases, significantly outperforming palpation at 67.7%. Palpatory findings revealed PTM in 36.5% of right and 45.9% of left feet, with a higher incidence observed in males. Ultrasonography was more effective, identifying PTM in 64.7% of right and 69.4% of left feet. Ethnic prevalence showed notable variation, with 87.5% occurrence in right feet among SSA individuals and equivalent prevalence in left feet for White participants. **CONCLUSIONS.** The prevalence of the PTM tendon exhibits considerable variability influenced by gender and ethnicity. Ultrasonography emerged as a superior detection technique over palpation. These insights have significant implications for the clinical utilization of PTM in tendon grafting and underscore the importance of tailored approaches in orthopedic interventions.

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Novel Anatomical Findings of the Superficial Tibial Collateral Ligament During Knee Flexion.

INTRODUCTION. During anatomical reconstruction techniques for the tibial collateral ligament (TCL), the apex of the medial femoral epicondyle (ME-apex) is a significant bony landmark. Based on previous descriptions, the anatomical relationship of the superficial TCL (sTCL) and ME-apex remains unclear. Therefore, the purpose of the present study was to evaluate the anatomical relationship of the sTCL and ME-apex using functional, gross anatomical and histological observations. **METHODS.** Five unpaired formalin-fixed cadaveric knees were used in this study. First, the dynamics of sTCL during range of motion were observed. Secondly, the femur, including the sTCL, was cut in the axial plane at the level of the ME-apex. Using this axial section, the location of the sTCL and ME-apex, the course of the sTCL fibers, and the morphology of the sTCL femoral attachment were evaluated histologically. **SUMMARY.** In the gross anatomical observations, the sTCL covered the entire ME-apex in full knee extension. As the knee flexed, the sTCL shifted posteriorly. In 90° of knee flexion, most of the sTCL fibers were bent and ran posterior to the ME-apex, but some sTCL fibers were directly attached to the ME apex. In the histological sections, the anterior margin of the sTCL was attached to the ME-apex. The sTCL was composed of two fiber bundles with different directions adjacent to the ME-apex. A four-layered structure, i.e., ligament, uncalcified fibrocartilage, calcified fibrocartilage, and bone, was observed at the boundary between the sTCL and the ME-apex. The four-layered structure was not present anterior to the ME apex but only from the ME apex to the sulcus posterior to it. **CONCLUSIONS.** The present study's findings will contribute to the quality of anatomical reconstruction techniques for TCL injuries.

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Revealing Shape Variations: Optimal Landmark Quantity for Mandible Statistical Shape Analysis.

INTRODUCTION. While research on the morphology often employs landmark-based analyses, study aiming determine the ideal number of landmarks lacks. Therefore, the aim of this study is to investigate whether the number of landmarks influences the detail and accuracy of results while examining sexual dimorphism in the mandible through three-dimensional statistical shape modeling. METHODS. This study utilized STL files of 88 mandibles (44 subjects in each sex) from Korean individuals. The statistical shape analysis was conducted using the open-source software *ShapeWorks*. Three different numbers of landmarks were utilized for analysis: 4096, 8192, and 16384. The detail of the average mandible models and the accuracy of male-female classification based on principal component analysis scores was compared depending on the number of landmarks used. SUMMARY. Increasing the number of landmarks in three-dimensional models enabled a more detailed interpretation of surface changes when comparing mean models between sexes. For instance, mandibular angle differences between males and females were better represented with more landmarks, showing increased precision in depicting differences. However, in mesh representations showing p-values, increasing landmarks led to decreased areas of significant changes. Additionally, training PCA scores with MATLAB's classification learner app showed a decrease in classification accuracy as the number of landmarks increased. CONCLUSIONS. This study highlights the importance of selecting an optimal number of landmarks for statistical shape analysis in mandibular morphological studies. More landmarks are beneficial for morphological analysis, while fewer are adequate for sex classification models. (This work is supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (MSIT) in 2024 (NRF-2018R1A6A7023490).)

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In-Situ Analysis of Sex Differences in ACL and Knee Compartment Structures.

INTRODUCTION. The anterior cruciate ligament (ACL) is a major stabilizing force in the knee, protecting against anterior tibial translation and rotation. Interestingly, the incidence of ACL injury is significantly increased in females compared to males. A possible explanation for this disparity could be due to sex differences in the proportions of knee compartment structures. In our study seeking to quantify these differences in situ, we hypothesized that male ACL length and ACL, intercondylar notch, and tibial eminence width would be increased compared to females. METHODS. 32 cadavers (17 male; 15 female) ages 50-100 (Avg. 81±10) were analyzed. Exclusion of knee replacements or injured ACLs yielded 60 knees with intact ACLs (30 male; 30 female). Following an inferior quadriceps reflection, structures were measured in sequence at 120° knee flexion: ACL length, ACL width, intercondylar notch, and tibial eminence width. Averages of observer values determined the measured dimensions of structures. SUMMARY. A significant difference was found in ACL length between males and females (30.1±2.9 vs. 27.4±3.4 mm; p<0.005). ACL width (11.1±3.3 vs. 10.3±2.3 mm), Intercondylar notch width (18.7±2.1 vs. 17.8±2.8 mm), and tibial eminence width (10.7±4.1 vs. 9.9±3 mm) did not demonstrate a significant difference. CONCLUSIONS. Based on our cadaveric study, our findings suggest that decreased ACL length and thus volume could be a causal factor in the increased incidence of ACL injuries in females. Future analysis of sex-based ACL differences investigating BMI/age correlations may help to better understand the relative risk of ACL injury.

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A Cadaveric Study of Variations of the Posterior Cerebral Artery.

INTRODUCTION. Anatomical variations of the arteries at the base of brain may predispose to clinical conditions such as stroke, leading to cognitive and sensorimotor deficits. The aim of this study was to report variant patterns of the posterior cerebral artery (PCA) at the Circle of Willis. **METHODS.** In a random sample of 35 fixed human brain dissections, variations of the PCA were observed. **SUMMARY.** PCA variations observed included: unilateral hypoplastic pre-communicating (P1) segment of PCA, bilateral persistent fetal PCA with hypoplasia of its P1 segment (posterior communicating artery contributing to the formation of PCA's post-communicating (P2) segment), and origination of the PCA from a common trunk with the superior cerebellar artery, the latter finding being less common than variations previously reported in association with the Circle of Willis. Anatomically variant patterns of PCA origin and distribution are likely due to factors acting during embryologic development. The clinical aspects relating to PCA variations are considered in the light of the literature. **CONCLUSIONS.** Our findings suggest that variations of the PCA at the Circle of Willis are not uncommon. The fact that variations were found in a random sample of donated cadavers, in which the cause of death was not reported as a cerebrovascular accident, highlights the importance of taking such variations into account in clinical practice. Future research should specifically emphasize the size and branching pattern of the PCA. Possible sex, age and population variability may also exist. Therefore, we recommend paying extra attention to these possibilities when developing overall guidelines for diagnosis and treatment of cerebrovascular pathologies.

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Specificity Analysis Study through Measuring Bite Force and Masseter Muscle Thickness of Athletes.

INTRODUCTION. Professional athletes have a bite force that is more than twice as much as that of ordinary people, and the contact area also shows a difference. Excessive force is applied to the teeth and bones, causing a decrease in performance, but this suggests that performance can be improved if the bite force is properly distributed. Therefore, we tried to establish data for identifying and classifying the specificity of the oral cavity of athletes, grasping the bite force, imbalance of left and right forces, and biased force per tooth. **METHODS.** In this study, a total of twelve male athletes who had trained in fighting sports professionally for more than 3 years participated, and twelve male non-professional athletes participated as a comparison group. Dental Prescale® sheet was used to record the bite force of the volunteers and the bite force was evaluated by an Occluser 709, GC. Then, they underwent an ultrasound examination for thickness of masseter muscle measurement using a real-time 2-dimensional B-mode ultrasound device with a B-mode high-frequency linear array transducer (SONON 500, Healcerion Co., Ltd., Seoul, South Korea). **SUMMARY.** The bite force was 856.9 ± 363.1 N in the non-athlete group and 1071.7 ± 380.2 N in the athlete group, which was significantly higher in the athlete group ($p < 0.05$). The difference value in bite force between each side was 43.1 N in the non-athlete group and 70.13 N in the athlete group, showing somewhat severe asymmetry in the athlete group. The thickness of the masseter muscle was 13.1 mm and 13.2 mm on the right and left sides of the non-athlete group, respectively, and 14.3 mm and 14.5 mm in the athlete group, showing the development pattern of the masseter muscle. **CONCLUSIONS.** Based on these results, it can be predicted that athletes who have performed professional training for a long period have stronger bite force and develop related muscles compared to non-athletes. Athletic coaches and dentists can help athletes use and manufacture appropriate protective devices based on their level of bite force and apply the results of this study to their treatment procedures. (This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (NRF-2022R111A1A01063123)).

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Use of Narrative Drawings to Improve the Understanding of Threshold Concepts in Anatomy.

INTRODUCTION. Understanding anatomy is fundamental for comprehending disease and developing competence as a physician. Students' understanding of this subject has been declining due to its complexity and breadth. Research shows that visual demonstrations are effective in learning anatomy. We aim to determine whether presenting threshold anatomical concepts through narrative drawing videos (NDV) will improve students' comprehension and overall learning experience. METHODS. First-year medical students enrolled in a foundational anatomy course at the Oakland University William Beaumont School of Medicine were invited to engage with NDV. In each video, a narrator drew and explained complicated anatomical structures. Students were encouraged to simultaneously draw the structures on their own template. To assess short term retention, pre- and post-video questions were used. Students were also provided with a survey of Likert scale questions to share their perceptions of the NDV. Exam scores will be gathered to explore any correlation between NDV use and performance on relevant questions. SUMMARY. In Fall 2023, a total of 125 students had access to three different NDV modules. Initial findings showed that students spent a combined 3,837.6 minutes watching the NDV. The pelvis and perineum NDV received 658 views from 112 viewers, cranial nerve NDV received 472 views from 60 viewers, and general head and neck NDV received 269 views from 39 viewers. Further data is currently being collected and analyzed. Compared to the control group, students who used the NDV are expected to have performed better on their final examination. CONCLUSIONS. Preliminary data indicates that students significantly benefited from the NDV, which is evident from the high level of interaction. This supports the effectiveness of integrating visual and interactive modalities into anatomical education for medical students. Findings may be used in the future to help guide the adjustment of the medical school curriculum to better meet the needs of students.

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3D Mapping of the Superficial Branch of Radial Nerve: Implications for Base of the Thumb Surgeries.

INTRODUCTION. Injury to the superficial branch of the radial nerve (SBRN) is a common complication during thumb surgeries with a reported incidence as high as 35.7%. 3D spatial understanding of the location of the nerve relative to the anatomical landmarks is important to mitigate nerve injury when planning surgical approaches. The purpose of this pilot cadaveric study is to assess the feasibility of using 3D modeling technology to map the spatial relationship of the SBRN to surgical landmarks. METHODS. In one distal forearm and hand specimen, the skin, bony and soft-tissue structures including the SBRN were serially dissected, digitized, and modeled in 3D. The 3D digitized data of the nerve was mapped to the reconstructed skin using Blender3D and custom plugins to visualize the position of the nerve relative to surgically relevant landmarks. SUMMARY. 3D spatial mapping of the SBRN enabled visualization of relationships to surgical landmarks. Based on the mapping, the superficial branch of radial nerve divided into lateral and medial branches proximal to the distal wrist crease. The lateral branch bifurcated into anterior and posterior divisions. The surgical landmark associated with the anterior division was the tendon of the abductor pollicis longus whereas the posterior division was the medial border of the extensor pollicis longus tendon. The medial branch coursed distally on the dorsum of the wrist and divided into several branches. Based on dissection and mapping, surgical landmarks associated with the medial branch were lister's tubercle and the proximal part of the extensor pollicis longus tendon, respectively. CONCLUSIONS. The cadaver-based 3D spatial mapping of the SBRN to the reconstructed skin *as in situ* is anatomically feasible. The 3D nerve map provides surgeons with a visualization of safe zones for thumb surgeries. Further anatomical study is required to increase sample size and document variations in nerve course.

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Post Renal Duplication of the Inferior Vena Cava: A Case Report and Literature Review.

INTRODUCTION. The inferior vena cava (IVC) is the largest vein in the body and drains deoxygenated blood from structures below the diaphragm back to the right atrium of the heart. Beginning near the pelvic bowl, it drains superiorly, accepting drainage from numerous tributaries, ultimately piercing the diaphragm and reaching the right atrium. **RESOURCES.** The present case is of a type BC (subtype II) duplicate inferior vena cava incidentally discovered upon student cadaveric dissection. A review of the literature revealed 18 cases of inferior vena cava duplications type BC subtype II which were reviewed to determine incidence of venous anomalies affecting the gonadal veins, tributaries of the renal vein, circumflex veins, and interiliac veins. **DESCRIPTION.** In addition to the duplication in our case, other anomalies include seven small additional hepatic veins, an atypically inferior confluence of the right inferior phrenic vein with the inferior vena cava as well as an anomalous confluence between the left inferior phrenic and the left duplicate inferior vena cava, atypical left renal and left circumflex iliac veins, and an additional peritoneal vein that contributes to the right gonadal vein, among others. Notably, this case does not present with an interiliac vein which has been noted in the literature in cases of similar vena cava duplications. No other vascular or extravascular abnormalities were noted on gross examination save a potential right renal artery aneurysm repair with implants, hepatomegaly, and a documented history of a cerebral aneurysm of unspecified type. **SIGNIFICANCE.** Anatomical variants, such as duplications, are the result of inappropriate regression of embryological structures including the posterior cardinal, subcardinal, supracardinal, and vitelline veins. Such variants can affect patient health, delivery of care, and care outcomes.

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3D Printing as a Tool in Teaching Anatomy of the Respiratory System: A Quasi Experimental Study.

INTRODUCTION. 3D prints are effective tools for teaching anatomy, positively impacting learning outcomes and satisfaction levels. The pedagogical effectiveness of 3D printing appears to be better when reproducing complex anatomical areas that are difficult to visualize on the cadaver. Based on these premises, the objective of this work was to investigate the effectiveness of using 3D printed models of the respiratory system on the learning of medical students. **METHODS.** An exploratory, almost experimental study was carried out with 200 students. 14 3D models were designed and printed on a printer and then distributed to a group of students and another group only had traditional classes. To measure learning, a structured test with 14 questions was used before and after using the pieces. To analyze the data, the Mann Whitney test was used, with $p < 0.05$ being considered significant. It was observed that the majority of students were female with an average age of 21.230.32 years. A statistically significant difference was observed in the 3D group's correct answers when compared to the traditional group ($p < 0.05$). The average number of correct answers in the pre-test was 3,46 when compared to the post-test with an average number of correct answers of 6,30. **SUMMARY.** 3D printing is a potentially disruptive technology that can improve surgical education and clinical practice. 3D printing proves to be a superior tool to traditional teaching and proves to be better in the quality of practical classes. **CONCLUSIONS.** 3D printing has proven to be an excellent tool in the teaching and learning process of anatomy, making teaching motivating associated with improving the identification of structures that cannot be visualized on the cadaver.

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Exhibition of the Rare Deep Abductor-Flexor of Digit #5 with Concurrent Hypothenar Aberrations.

INTRODUCTION. Intrinsic coordination of the fifth digit of the hand is largely controlled by the abductor digiti minimi (ADM), flexor digiti minimi brevis (FDMB), and opponens digiti minimi (ODM) muscles (i.e., the hypothenar muscles). Non-typical hypothenar morphology has been reported; however, biomechanical analyses are seldom performed and descriptions of rare variants such as the deep abductor-flexor of digit #5 (DAF5) are especially scarce. This study investigates an especially unique case involving the rare DAF5 among additional hypothenar muscle aberrations with biomechanical analysis and discussion of clinical relevancies. RESOURCES. An especially unique case of multiple unilateral (left) hypothenar muscle aberrations was discovered during routine human cadaver dissection. The aberrations were cleaned of extraneous fascia and photographed in situ. Mass and fascicle length were measured and mean postmortem fixed sarcomere states were determined via light microscopy to calculate a normalized maximal isometric force (F_{max}) for each muscle. DESCRIPTION. The concurrent aberrations included two accessory ADM muscles, three accessory FDMB muscles, an accessory ODM muscle, and a bicipital DAF5. The curved long head of DAF5 ($F_{max} = 4.77$ N) originated from the transverse carpal ligament (across midline), while the straight short head ($F_{max} = 1.23$ N) originated from the pisiform. The two heads united to form a prominent 3 cm tendon which inserted on the base of the fifth proximal phalanx. Notably, the long head separated the ulnar artery (superficial) from the ulnar nerve (deep). SIGNIFICANCE. The exhibition of successive hypothenar anomalies could influence fifth digit coordination for proper hand function, and the concomitant DAF5 could implicate carpal tunnel release surgery and lesion the ulnar nerve. Insights from this report may inform occupational and physical therapists, orthopedic surgeons, and clinical educators when treating or deliberating related cases.

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Impact of Tourniquet Application on Median Cubital Vein Anatomy: An Ultrasound Investigation.

INTRODUCTION. The median cubital vein (MCV), situated in the cubital fossa, is frequently accessed for venipuncture. Recognizing the impact of tourniquet application on the MCV's anatomical relationship with adjacent neurovascular structures is critical for reducing procedural risks. This study employs ultrasonography to explore the effects of tourniquet application on the MCV's dimensions and location, thereby extending the scope of existing research through a diverse and larger sample size. METHODS. A total of 60 subjects, aged 18-46 and including 28 males and 32 females from varied ethnic backgrounds (Sub-Saharan African (SSA), Middle Eastern and North African (MENA), South Asian constituting 48% of the sample, and others) were assessed. The GE LOGIQ ultrasound machine equipped with a linear transducer (10-12 MHz, 3.5 cm depth) was used to measure the MCV's diameter and its distance from the brachial artery, median nerve, and skin surface on the right arm in a supine position, pre- and post-tourniquet application. Statistical significance was determined using the paired T-test. SUMMARY. Significant alterations were observed in the MCV's diameter and its spatial relationship to the brachial artery and median nerve following tourniquet application ($p < 0.005$), indicating a notable impact. Conversely, the distance from the skin surface remained unchanged. The study also found that 3.3% of participants from the MENA region had the MCV located beneath the bicipital aponeurosis, 8.3% with an absence of MCV in SSA participants, and 5% with brachial artery and median nerve directly inferior to the MCV. CONCLUSIONS. The use of ultrasonography has proven to be a non-invasive method to accurately assess the anatomical changes in the MCV due to tourniquet application, enhancing procedural safety by minimizing the risk of damaging adjacent structures. Further studies are warranted to explore these effects bilaterally and in a broader ethnic spectrum.

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Cadaveric Analysis of Bilateral Short Rectus Femoris Muscles.

INTRODUCTION. Rectus femoris is the only bi-articular muscle of the quadriceps group present in the anterior compartment of the thigh. It involves both hip flexion and knee extension. In this case study, we present bilateral short rectus femoris muscle belly, an unusual rectus femoris muscle variation observed in a 69-year-old female donor body during routine dissection at the Arkansas College of Osteopathic Medicine. Symmetrical muscle wasting of the rectus femoris, without involvement of any other anterior compartment muscles, raised suspicion of hereditary myopathies of the lower limb. RESOURCES. The female donor body was obtained through the Arkansas Colleges of Health Anatomical Body Donation program, a "whole body" program that follows state and federal legislation requirements. An extensive review of case studies and PubMed literature searches on lower limb myopathies showed that an "outside-in" progression of muscle wasting is generally seen in congenital myopathy and collagen VI-related myopathies. However, this was not observed in the cadaver presented in this study. On further investigation, a study that focused specifically on rectus femoris showed that selective wasting of rectus femoris is related to COL12A1-related myopathy. DESCRIPTION. The quadriceps muscle group includes the rectus femoris muscle, which is located superficially and medially at the anterior thigh. Abnormalities are sometimes found in the rectus femoris muscle. Past studies have indicated a unilateral short belly of the rectus femoris. This case report will discuss our findings of a bilateral short muscle belly of the rectus femoris on a female cadaver. SIGNIFICANCE. This finding has scarcely been noted in previous literature, is extremely rare, and may have further implications. Knowledge of the variation of rectus femoris and its clinical significance may be helpful to clinicians when making decisions to screen patients and their families for inherited myopathies.

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Integration of Radiological Imaging into the Anatomy Cadaver Lab.

INTRODUCTION. The incorporation of radiological images into the anatomy curriculum has become standard pedagogy in anatomy education and has demonstrated positive effects on student learning and examination outcomes. Integrated radiological anatomy modules have been shown to enhance radiological reasoning abilities and critical thinking skills in medical students. While many schools have implemented radiological imaging into their curriculum, few have incorporated it into the Anatomy cadaver lab as there is limited information available on the use of radiological imaging integrated into the Anatomy cadaver lab. Radiological images were introduced into the Anatomy cadaver lab as part of the Anatomy curriculum of the St. George's University School of Medicine SOM in 2018. The study aims to provide insights into how the integration of radiological images into the Anatomy cadaver lab can affect students' confidence in and ability to interpret medical images and can improve their overall learning experience. METHODS. Students were asked to complete surveys using the Point Solutions Audience Response System at the beginning and at the end of their Abdomen Anatomy cadaver lab. Both Pre and Post lab surveys contained questions relating to the students' confidence in interpreting radiological images and they were asked to identify anatomic structures in three separate radiological images. The Post-lab survey contained the same three radiological images as the Pre-lab survey but students were asked to identify different structures. SUMMARY. Chi Squared Test of independence showed a significant increase in students' confidence in interpreting medical images (p 0.00, with a moderate effect), and a significant increase in students' confidence in interpreting gastrointestinal images (p 0.00, with a moderate effect). CONCLUSIONS. The integration of radiological images into the Anatomy cadaver lab has given students increased confidence in their ability to use their anatomical knowledge when interpreting medical imaging.

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An Unexpected Variation of Occipital and Ascending Pharyngeal Arteries: Clinical Implications.

INTRODUCTION. The eight typical External Carotid Artery (ECA) branches are the superior thyroid artery, ascending pharyngeal artery, lingual artery, facial artery, occipital artery, posterior auricular artery, maxillary artery, and superficial temporal artery. The Internal Carotid Artery (ICA) has no branches in the cervical portion before entering the carotid canal. We identify a variant of the Occipital Artery (OA) and Ascending Pharyngeal Artery (APA) originating in the cervical portion of the ICA. **RESOURCES.** Between August and December 2023, 28 formaldehyde donors were dissected in the anatomy course for first-year medical and PA students at the Creighton University School of Medicine, Phoenix campus. **DESCRIPTION.** Dissection of the right common carotid artery (CCA) revealed a variation of the ECA branches. Two branches were found on the proximal portion of the ICA. After tracing the branches cranially, we identified these as the OA and APA. These are two arteries typically found originating from the ECA. With the ECA traveling anteromedially and the ICA traveling posterolaterally, the OA is seen branching from the lateral aspect of the proximal ICA, and the APA originates on the medial aspect of the proximal ICA. This variation was only observed on the right side. The left CCA bifurcated as expected into the ICA and ECA, with each branch of the ECA identified. **SIGNIFICANCE.** The prevalence of the OA arising from the ICA is 0.2%. This variation occurring in combination with the APA originating on the ICA is even more uncommon so studying these anatomical variations and their paths bears great clinical significance. Knowledge of the OA variants greatly supports surgeons and interventional radiologists in performing procedures such as posterior fossa revascularization to treat tumors, temporoparietal fascia flap, OA aneurysms, and OA embolization. Also, the APA variant has clinical associations, such as epistaxis, meningiomas, vascular lesions, and others.

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Clinical Anatomy for Dental Residents: A Targeted Competency-Based Laboratory Approach.

INTRODUCTION. Residency anatomy courses requires instructional design emphasizing clinical skills reinforcement and patient care application. This approach enables dental residents to link clinical competencies with relevant anatomical knowledge. Hands-on laboratory experience with didactic orientation improves trainee confidence in navigating head and neck's anatomy. This presentation aims to demonstrate the design of a clinically oriented head and neck anatomy course for dental residents, focusing on improving procedural skills for enhanced patient care. **RESOURCES.** The course included three components: (1) "prework" via a Learning Management System, (2) expert-driven "didactic sessions," and (3) a "laboratory session" using body donors and enhanced video instruction. **DESCRIPTION.** A 12-week course included prework with pre-recorded dissection videos and readings; an in-lab didactic session with short yield presentations covering pathology, syndromes and imaging related to their clinical practice from an anatomical standpoint; and an in-person laboratory session reviewing prosections in an immersive environment with high-definition cameras to focus on small anatomical regions. The laboratory session involved specimen dissection, encouraging students to employ a clinically oriented, original approach. The course underwent formal evaluation with a lab practical and written exam; and a dissection presentation graded through a rubric. **SIGNIFICANCE.** Increasing demand for anatomy education during clinical training predicts a shift in acquired anatomical knowledge positioning in medical education. To address anatomical knowledge gaps in the laboratory setting, most residents depend on opportune experiences or informal apprentice-based learning. Structured laboratory-based anatomy courses significantly enhance clinical practice. Their formal integration into clinical training years requires well designed approaches tailored to core competencies within clinical programs.

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An Anatomical Study of the Talus for Improved Screw Placement during Fracture Repair.

INTRODUCTION. Screw fixation is the most common and effective treatment for fractures of the talus. Morphological information about the talus is essential to understanding and characterizing the anatomy of the talus for preoperative evaluation. Therefore, it is essential to know the morphometrics of the lateral tubercle of the posterior process of the talus to reduce side effects and complications. Therefore, this study aimed to investigate the morphology of the talus. METHODS. A total of 800 tali from Northeastern Thailand (200 males and 200 females, mean age at death 64.87 ± 14.06 years) were used for this study. The length, width, and height of the lateral tubercle of the posterior process of the talus were measured and classified. SUMMARY. The morphometric parameters of the talus bone, i.e., length, width, and height, were 54.85 ± 4.30 mm, 38.69 ± 3.16 mm, and 30.25 ± 2.41 mm, respectively. There was no significant difference between the right and left sides for any of these parameters ($p > 0.05$). There was, however, a significant sex difference. Additionally, these morphometrics were greater in northeastern Thailand compared to some other ethnicities e.g., India. CONCLUSIONS. These parameters can be used for the preoperative evaluation of patients undergoing repair of talus fractures.

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Utilization of Peer-Led Instructional Videos Based on 3D Scans of Plastinated Anatomical Specimens.

INTRODUCTION. Three-dimensional (3D) virtual models are changing the way that anatomy is taught and assessed in medical schools. However, these models are often not derived from actual human specimens, and their anatomical accuracy is unverified. Our institution employs 3D scans of plastinated human specimens for anatomy instruction and has created peer-led instructional videos based on these 3D scans. This study seeks to evaluate the efficacy and popularity of a 3D scan-based video series in teaching lower limb anatomy. METHODS. The video series consists of five videos based on interactive 3D scans of the lower limb and was provided as an optional study material to 50 first-year medical students preparing for the musculoskeletal anatomy practical examination (APE). No videos on upper limb anatomy were provided. We tracked student engagement with the video series and APE performance, and collected feedback via a survey. SUMMARY. Nineteen students who viewed three or more videos were classified as "Users". Six students who briefly accessed one or two videos were excluded from analysis. The remaining 25 students were categorized as "Non-users". Users performed significantly better ($p < 0.05$) on lower limb questions in the APE compared to upper limb questions. No significant difference was observed in Non-users' scores on lower vs. upper limb questions. Of survey respondents, 92.3% found the 3D scans beneficial for APE preparation, and 87.5% found the video series beneficial. Qualitative feedback demonstrated that 3D scans were helpful due to their ease of access and ability to demonstrate spatial relationships, and that the video series was helpful due to its clarity and ease of navigation relative to the scans. CONCLUSIONS. This study indicates that 3D scan-based videos were well received by students and may enhance student performance in APEs. This suggests that 3D scans and 3D scan-based videos may be valuable resources for both anatomy educators and learners.

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An Autophenomenography Exploration of Preparing for Medical Anatomy Instruction through Prosections.

INTRODUCTION. Cadaveric dissection among undergraduate and medical students have been linked to higher retention and performance among students in the anatomical sciences. Furthermore, medical students prioritize cadaveric prosections and interactive learning sessions as the most valuable resources for mastering anatomy. However, a notable gap exists regarding instructors' experiences engaging in cadaveric prosections prior to delivering anatomy instruction. This autophenomenography dives into the experiential dimension of investigating the experience and potential benefits of conducting multiple cadaveric prosections in preparation for teaching a medical level gross anatomy course. METHODS. Utilizing a qualitative research approach, one individual conducted two prosections of a human cadaver at various levels of detail. During this process, the participant documented their individual experience, generating narrative accounts in the span of five months prior to teaching a first-year gross anatomy medical school lab course. Thematic analysis was then used to identify codes, subthemes, and themes in the personal reflections through multiple coding sessions. SUMMARY. The results show the nuanced experiences of prosections, revealing initial frustrations with anatomical variations and dissection challenges that ultimately contributed to heightened confidence in both personal dissection techniques and teaching capabilities. Additionally, the study underscores the critical roles of resource and time management during prosections including utilization of textbook and human cadaver atlases and organization of dissections. CONCLUSIONS. This study provides a thorough examination of the time spent involved with prosections and the response it has on individuals teaching for medical education. Not only do prosections contribute to enhanced understanding of anatomical material but aids in the confidence of ability to teach, adapt, and learn at the medical school level.

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A Bridge Over the Gallbladder - A Case Report.

INTRODUCTION. The human liver has multiple morphological variations in the general population, including size, fissures, and lobe differences. During routine dissection, an anatomically unique liver was discovered containing three tissue bridges connecting three lobes. One of these bridges uniquely straddled the body of the gallbladder. The other two bridges connected the quadrate lobe with the left lobe of the liver over the umbilical fissure. RESOURCES. A 92-year-old female donor was received through the Saint Louis University School of Medicine Gift Body Program with signed informed consent. DESCRIPTION. The body of the gallbladder was surrounded by a tissue bridge, likely composed of liver tissue, which connected the quadrate lobe and right lobe. This tissue bridge measured 27.96 cm long and 0.20 cm thick. Additionally, the liver was noted to have two other tissue bridges that joined the left lobe and quadrate lobe over the umbilical fissure one of which appeared to be peritoneal tissue and the other a pons hepatis variation. The overall liver shape was atypical, and a lingular process was noted on the left lobe. The portal vein, the proper hepatic artery, and hepatic ducts were arranged in typical orientation within the hepatoduodenal ligament. SIGNIFICANCE. While liver variations are not uncommon and rarely lead to pathogenesis, there are still clinical benefits to better understanding these morphological abnormalities and their prevalence. In instances of malignancies causing unusual liver proliferation, this anatomical variation could lead to obstruction of the gallbladder. Gallbladder constriction by the tissue bridge could be a concern if associated with obstruction and cholelithiasis. Another concern is the possibility of misdiagnosis as a hepatocellular carcinoma or an abscess.

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*SRINIVASAN, William¹, Alissa K. MAURER², and Ethan L. SNOW². ¹College of Medicine, University of Nebraska Medical Center, Omaha, NE, 68198, USA; ²College of Natural Sciences, South Dakota State University, Brookings, SD, 57007, USA. Cerebral Convexity Arachnoid Cysts: A Clinical Review with Cadaveric Case.

INTRODUCTION. Arachnoid cysts are non-neoplastic accumulations of cerebrospinal fluid formed within partitioned layers of the arachnoid mater. They represent about 1% of all intracranial masses in humans. Most arachnoid cysts present in the middle cranial fossa, but few may occur along the cerebral convexity above the tentorium cerebelli. Gross imaging of cerebral convexity arachnoid cysts (CCACs) is extremely scarce. The purpose of this study is to investigate the clinical implications of CCACs and present gross imaging and clinical analysis of an exceptionally large CCAC. RESOURCES. A systematic literature review was conducted to identify primary sources of anatomical and clinical information about CCACs. A particularly large CCAC was discovered during routine academic dissection of an elderly human cadaver, and the condition was photographed in situ. Documentation of sulcal and gyral impact ensued as the basis for discussing the probable clinical implications associated with the case. DESCRIPTION. CCAC formation is attributed to congenital (primary) or trauma-related (secondary) etiologies. While they are often asymptomatic, CCAC location and size can influence symptomatology. The anticipated increase in intracranial pressure can elicit mild (e.g., headache) to severe (e.g., seizure, hydrocephalus, endocrine dysregulation) sequelae. The present case exhibits a remarkably large CCAC that developed within the left central sulcus and nearly spanned its entirety. The cyst separated the precentral and postcentral gyri by over 8.5x (range = 6.0x to 13.3x) their typical adjacency and occupied a comparably deep space. The central sulcus artery and vein were present in its midline and appeared unaffected. SIGNIFICANCE. As CCACs are mostly diagnosed with CT and/or MRI, gross imaging of CCACs is extremely rare. This study provides clinical anatomists, neurologists, and neurosurgeons with visual insight and perspective into the physical and clinical presentation of CCACs.

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Angular Force Mechanics of Duplicated Piriformis Muscles with Unilateral Sciatic Nerve Involvement.

INTRODUCTION. The piriformis muscle coordinates external rotation, abduction, and extension of the thigh. The superior gluteal and sciatic nerves characteristically enter the gluteal region just superior and inferior to the piriformis, respectively. Variations in piriformis morphology can lesion these nerves but reports of concurrent piriformis aberrations with biomechanical analysis are scarce. The objective of this study is to investigate angular force mechanics of duplicated piriformis muscles with concomitant unilateral sciatic nerve involvement. RESOURCES. The present case was discovered during routine human cadaver dissection. The aberrations were cleaned and photographed in situ. Attachment angles of the duplicated piriformis muscles and split piriformis belly to the force axis of the typical piriformis were recorded. Mean fixed sarcomere states were measured via light microscopy to calculate normalized maximal isometric forces (F_{max}) and atypical vector forces on the piriformis tendon. DESCRIPTION. The bilateral duplicated piriformis muscles (mean $F_{max} = 7.57$ N) originated on the gluteal surface and inserted at mean 34.8° onto the tendon of piriformis (mean $F_{max} = 44.35$ N) superiorly. Concurrently, the superior (common fibular) segment of the left sciatic nerve coursed through piriformis (Type II presentation), separating a small muscular belly ($F_{max} = 3.14$ N) which joined the piriformis tendon at 30.3° inferiorly. SIGNIFICANCE. Duplicated piriformis muscles can compromise contralateral hip stabilization during the swing phase of the gait cycle from a superior gluteal nerve lesion (Trendelenburg sign) and influence ipsilateral hip mechanics from atypical angular forces on the piriformis tendon. Moreover, the sciatic-piriformis complex could impinge the sciatic nerve (piriformis syndrome) and elicit sciatica. This case report may inform clinical educators, orthopedic surgeons, and physical therapists about piriformis anomalies when deliberating related cases.

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Probing the Spatial Relationships: Morphometric Study of the Anterior Intermeniscal Ligament.

INTRODUCTION. The anterior intermeniscal ligament (AIML) is an anatomical structure implicated in knee biomechanics. Despite its high prevalence, variable insertion patterns, and proposed roles in stabilizing meniscal movements, conflicting perspectives persist regarding its functional significance, particularly in transforming axial loads and/or proprioception. This study aimed to elucidate the AIML anatomy and spatial relationships within the knee joint. **METHODS.** This observational study was conducted utilizing a cohort of 56 viable knee specimens from 21 female and 12 male cadavers (aged 45-95 years) obtained from 2 academic institutions. Intact specimens were observed through dissecting through the anterior knee, exposing the AIML and surrounding soft tissue structures. Measurements were obtained utilizing a vernier digital caliper. **SUMMARY.** The average AIML length was found to be 34.44 ± 4.74 mm and 34.81 ± 4.82 mm for the right and left knees. The AIML mean length trended bilaterally larger in males (right= $+0.69$ mm; left= $+0.12$) when compared to females. AIML midpoint thickness was found to be 1.16 ± 0.50 mm (right) and 1.14 ± 0.44 mm (left). Males trended an increased thickness of 0.15 mm (right), and 0.13 mm (left) when compared to females. AIML to Anterior Cruciate Ligament (ACL) root length measured 11.22 ± 3.08 and 11.61 ± 3.83 mm for the right and left limb respectively. Further spatial relationships within the knee capsule were also explored. **CONCLUSIONS.** This study contributes valuable anatomical data, addressing a deficiency in 2D/3D imaging and visual models describing the spatial relationship of the AIML to other nearby soft tissue structures. The refined understanding of AIML anatomy aids in improving clinical outcomes for knee injuries and surgical corrections, ultimately optimizing postoperative results, and improving current surgical techniques.

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The Correlation Between Geographic and Demographic Variables on Vertebral Artery Variance in the US.

INTRODUCTION. Vertebral artery (VA) variants are more prevalent than previously thought, yet there is little data on the correlation of these variants to demographic or geographic variables. No cadaveric studies have been published on this data in the U.S. with few studies overseas examining the correlation. **METHODS.** Whole body donors from Ohioan (OH) and Nebraskan (NE) medical schools were dissected to expose the VA in its entirety. VA characteristics recorded were: origin site, origin level, entrance level, length, tortuosity, diameter, and origin distance from common carotid (R) or subclavian (L) arteries. Demographic information such as age, sex, race, cause of death, and other medical conditions were also obtained. Correlation statistics were analyzed using SAS to correlate demographic information to VA characteristics. **SUMMARY.** Of 121 donors analyzed, 79 (65%) were from OH and 42 (35%) were from NE. VA anomaly prevalence was not significantly different between the two geographic locations (20.2% of anomalies in OH, 16.7% of anomalies in NE). 56.5% of anomalies were observed in males and 43.5% in females. While not yet statistically significant, 71.4% of Nebraska's anomalies occurred in males. There was a significant difference in tortuosity of the left VA (LVA) among males and females ($p=0.03$) with females more tortuous at $D11.01$ mm vs. $D6.78$ mm in males. OH donors were more likely to have a T1 level of origin for the right VA (RVA) (48.1%) compared to 28.6% in NE ($p=0.008$). OH (4.85mm) and NE (4.33mm) had a statistically different LVA diameter at entrance ($p=0.013$) and a statistically significant difference in RVA entrance diameter (OH: 4.61mm, NE: 3.97mm, $p=0.001$). **CONCLUSIONS.** Understanding VA variants is crucial for positive healthcare outcomes. Variants may be more prevalent in certain populations; and knowledge of this could determine screening protocols for individuals that are predisposed to variants. This study adds to the data on regional VA variants.

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Effect of Restricted Stride Length on Lower Limb Joint Angles.

INTRODUCTION. Laboratories equipped with force plate systems are used to evaluate pathologic gait mechanics; however, this environment does not fully reflect the real world. Many labs have force plates embedded in the floor at fixed intervals, forcing those with longer strides to alter their gait. This may lead to inaccurate kinematic data and poor treatment outcomes. Here we evaluate an individual walking at a normal and a restricted stride to investigate how changes in stride length impact lower limb joint angles. **METHODS.** Motion capture data was collected for one subject walking at normal and fast velocities, with and without a burden (10kg), at restricted and natural strides (five trials per condition). Ankle plantarflexion, subtalar eversion, knee flexion, and hip abduction, extension, and flexion angles were measured using the AnyBody Modeling System at heel-strike (HS) and toe-off (TO) for a single stride per trial. Wilcoxon rank sum tests were used to test for significant differences in joint angles between the two strides for each condition. **SUMMARY.** There are significant differences in all angles at TO ($p < 0.01$) for normal velocity with and without a burden such that ankle plantarflexion, knee flexion, and hip abduction decrease when restricting stride (3.9-19.5 degree difference), while hip flexion, extension, and subtalar eversion increase (2.5-14.4 degree difference). Restricting stride at fast velocity (no burden) significantly impacts ankle plantarflexion angle at HS and TO ($p < 0.007$; 7.3-12.2 degree difference). **CONCLUSIONS.** Here we demonstrate the importance of analyzing natural stride, rather than a restricted stride, to facilitate accurate diagnosis and appropriate treatment recommendation in cases of gait pathology. Individuals with longer natural strides may receive suboptimal therapeutic intervention due to standardization of gait labs. It is imperative to consider variation in stride lengths when setting up force plates for gait analysis.

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Consecutive Anterolateral Intervertebral Disc Herniations with Ossified Fusion of T6-T11 Vertebrae.

INTRODUCTION. Intervertebral discs (IVDs) contain a nucleus pulposus (gelatinous matrix of collagen) enclosed by an annulus fibrosus (concentric lamellae of fibrocartilage) and end plates (hyaline cartilage) – which together permit resilient deformability and shock absorption between vertebrae. Herniation of the nucleus pulposus from damage or disease of the annulus fibrosus most commonly occurs in the lumbar and cervical spines, in the posterolateral direction, and to a single IVD. The purpose of this investigation is to study a remarkably unique case of five successive IVD herniations occurring in the anterolateral direction within the thoracic spine, which resulted in ossification-fusion of the T6-T11 vertebrae. **RESOURCES.** The case was discovered during routine dissection of an adult human cadaver. The ossified herniations were cleaned of extraneous tissue and photographed in situ. T1- and T2- weighted Magnetic Resonance Imaging (MRI) was performed on the implicated spine, and serial cross-sectioning was completed through each IVD and vertebrae. Each section was photographed, and linear parameters of the IVD extrusions were measured. **DESCRIPTION.** The ossified herniations extruded 11.1 ± 2.1 mm (range = 13.7 to 9.3 mm) from the typical IVD border, and the ossified bridging over the vertebral bodies extruded 6.9 ± 2.6 mm (range = 10.1 to 4.6 mm) from the typical vertebral body border. The extrusions displaced the functionality of the anterior longitudinal ligament 7.37 mm left of midline, and comparison of gross in situ and cross-sectional imaging with MRI further illustrates the extent of IVD herniation and vertebral fusion. **SIGNIFICANCE.** This study presents a case involving multiple uncommon features of IVD herniation. The gross in situ and cross-sectional imaging paired with MRI may be especially relevant to clinical anatomists, doctors of chiropractic medicine, spine neurosurgeons, and other healthcare experts when discussing or treating related patient cases.

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*VALLABHAJOSYULA, Ranganath¹, Yong Yi TAN¹, Vasanth Sree RAM², Vivek PERUMAL¹, and Emmanuel Chee Peng TAN¹. ¹Lee Kong Chian School of Medicine (LKCMedicine), Nanyang Technological University, 636921, Singapore; ²School of Chemistry, Bioengineering and Biotechnology (CCEB), Nanyang Technological University, 636921, Singapore. Medical Student Perceptions on Threshold Topics and the Role of Creative Models for Active Learning.

INTRODUCTION. Threshold concepts are a subject of interest in medical education research. They are often troublesome and present challenges for medical students who often try different learning methods like creative models for better learning of these topics. Qualitative studies on threshold concepts in preclinical education and its framework for learning support are limited. This study aimed to gather qualitative evidence on the threshold nature of various topics from the preclinical years in the integrated system-based medical curriculum and arrive at a framework along with the feasibility of creative models that would fit to actively learn such topics. **METHODS.** Perceived perceptions from students of year 1, year 2, and year 3 were obtained through focus group discussions and in-depth one-to-one interviews. The verbatim of the recorded discussions was analyzed using qualitative content analysis software (QCAmap). Deductive and inductive coding analysis was conducted for the perceptions on the threshold topics and suggestions on the usage of creative models to support learning. Codes were thematically analyzed to arrive at an explanatory schema. **SUMMARY.** 18 participants volunteered for the qualitative study. There were three focus group discussion sessions each consisting of 4 participations and 5 one to one in-depth interviews. Deductive content analysis yielded the underpinning theme as “TRANSFORMATIVE” for learning threshold topics where participants overcame learning challenges to effect an irreversible change in understanding. Three key challenges were identified that elevate the threshold nature of the topics in preclinical years such as multi-component or multi-factorial topics, contradictions between new and old understanding, and boundedness. Participants proposed easy-to-reproduce models such as flowcharts, paper cut-outs, and building blocks to help visualize complicated concepts and draw links between topics. Participant’s perceptions of creative model feasibility were well-mapped to the threshold topic learning process. **CONCLUSIONS.** Learning threshold topics is challenging, becomes transformative with gradual engagement, and eventually achieves an irreversible learning outcome. Creative models present as possible tools to increase learner engagement.

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Exploring the Presentation of Diffuse Idiopathic Skeletal Hyperostosis: A Cadaveric Case Study.

INTRODUCTION. Diffuse idiopathic skeletal hyperostosis (DISH) is a diffuse spinal arthritic disease that commonly presents asymptotically in the 8th decade of life and is found incidentally on imaging and post-mortem workups. Classic presentation of DISH involves bridging ossifications on the anterior and right anterolateral aspects of the cervical and thoracic vertebrae, respectively. **RESOURCES.** During routine medical education cadaveric dissections, evidence of ossifications characteristic to DISH were found on a 75-year-old deceased male subject. Lesions were noted on the anterior vertebral bodies of C2 through L4, including unique involvements on the posterior facets and spinous processes of the cervical spine. Visual and physical isolation of the spinal vertebrae was conducted with gross removal of the supraspinous ligament, musculature, and soft tissue organs. Post-dissection x-ray imaging was carried out after rib and thoracolumbar lamina resection, revealing lesions spanning from the C2 to L4 vertebrae in anteroposterior, lateral, and posteroanterior views. X-ray interpretation was performed by a board-certified radiologist confirming the likely diagnosis of DISH. **DESCRIPTION.** Here we present unique gross anatomical findings alongside a radiographic X-ray series conducted on a dissected cadaver showing the pathological morphology of DISH. **SIGNIFICANCE.** Severe DISH is rarely described clinically. However, extensive ossifications in the cervical vertebrae as seen in this study implicates physiologic deglutition and neuropathies through mass effects, while bilateral thoracic growths potentiate the formation of atherosclerotic plaque through disruption of laminar aortic flow. Studying the pathologic anatomical relationships and radiologic manifestations of this unusual severe DISH presentation can inform targeted interventional therapies aimed at diagnosing and managing the condition.

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YAZAR, Fatih¹, Alparslan SARI² and Ahmet KORKMAZ³. ¹Department of Anatomy, Gullhane Faculty of Medicine, University of Health Sciences, Ankara, Turkey; ²Department of Electrical and Computer Engineering, University of Delaware, Newark, DE, 19716, USA; ³John Snow Labs, RWTH Aachen University, Maasmechelen, Belgium.

What Should an Artificial Intelligence Anatomy Program Look Like?

INTRODUCTION. Over the preceding decade, significant technological advancements, particularly within the realms of informatics and healthcare, have radically transformed the domain of anatomy education. Despite the vast accumulation of data within anatomy, a pivotal challenge remains: the assessment and categorization of this information for the benefit of health students and professionals. It is anticipated that the resolution to this challenge will emerge through the synergistic endeavors of anatomists and computer scientists, leveraging artificial intelligence (AI)-enhanced software applications. **RESOURCES.** AI is at the forefront of revolutionizing student learning by offering direct instruction, supporting educators, and fostering personalized learning experiences. This includes remote instruction, timely feedback, innovative evaluation methods, and user-centric interfaces. **DESCRIPTION.** Contemporary scholarly discourse characterizes “AI” as computational systems capable of analyzing data to identify patterns, autonomously making decisions and predictions, and executing tasks traditionally requiring human-level intelligence, all without explicit programming beyond their initial objectives. Anatomy has been a cornerstone of medical education for centuries, but the evolution from traditional anatomy to novel AI applications presents numerous challenges. Anatomy educators bear a significant responsibility to judiciously integrate AI into anatomical instruction, thereby overcoming the limitations and challenges of conventional teaching methods. This integration is crucial for developing new pedagogical paradigms and adapting to technological progress. **SIGNIFICANCE.** This study endeavors to elucidate the importance of integrating optimally desirable AI applications into anatomical instruction and their potential contributions to enhancing the efficacy of anatomy education, illuminated by the wealth of anatomical resources available.

POSTER SESSION 3 – WEDNESDAY, JUNE 19 FROM 3:15 PM - 4:15 PM

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*AGRAWAL, Kriti, Anna P. FASMAN, Hannah XU, Natalia HALPERN, Maya M. ALMOUSSA, Dhanya ASOKUMAR, Jared APPLGATE, Cristina R. PRALL, and David W. BRZEZINSKI. Division of Anatomical Sciences, Department of Surgery, University of Michigan Medical School, Ann Arbor, Michigan, 48109, USA.

Penetration of the Anterior Scalene by C5 Ventral Ramus.

INTRODUCTION. The brachial plexus is an intricate network of nerve fibers that supplies sensory and motor innervation to the upper extremities. Each nerve root of the plexus splays out into trunks, divisions, cords, and branches. Brachial plexus roots typically pass between the anterior and middle scalene muscles with the subclavian artery, bilaterally. However, variations in this trajectory are somewhat common. One study found that up to 40% of patient donors do not display this “normal” anatomical relationship with the most common divergence being direct penetration of the anterior scalene musculature by the C5 or C6 ventral primary rami. Normal dissection during a medical school anatomy course revealed C5 ventral rami piercing immediately through the anterior scalene muscle belt, bilaterally. **RESOURCES.** A cadaveric specimen was dissected using standard dissection. **DESCRIPTION.** Standard dissection of the inferolateral neck on a female donor revealed bilateral piercing of the C5 ventral ramus through the anterior scalene muscle, prior to contributing to the superior trunk of the brachial plexus. The ventral rami of C6-T1 followed an expected course between the anterior and middle scalene muscles, and the distal branching of the brachial plexus appeared normal, bilaterally. **SIGNIFICANCE.** The presence of an anatomical variant involving the bilateral C5 ventral root piercing through the anterior scalene muscle (ASM) may have significant clinical implications in both medical and surgical contexts. Existing literature has documented potential complications, such as thoracic outlet syndrome, greater susceptibility to nerve damage, and reduced effectiveness of interscalene brachial plexus blocks, associated with similar variants. Furthermore, recognizing these anatomical variants can be pivotal for specific applications in orthopedic surgery and neurosurgery, offering valuable insights for interventions. However, as seen with this patient donor, variation in this particular anatomical relationship may be clinically insignificant.

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Anatomical Variations in Formation and Branching Pattern of Lumbar Plexus.

INTRODUCTION. Lumbar plexus block, a form of regional anaesthesia, is a relatively safer method of anaesthesia particularly useful in sacroiliac and pelvic region surgeries. Knowledge of anatomy of lumbar plexus, including the possible variations in the formation and branching pattern of lumbar plexus, is essential for anesthesiologist and clinicians dealing with such cases. The study was conducted to determine any anatomical variations in lumbar plexus in the local population. **METHODS.** 80 lumbar plexuses (40 on right & 40 on left) in formalin fixed 40 adult human cadavers (26 male and 14 female) were studied. The lumbar plexuses were dissected through the anterior approach bilaterally and the roots and branches were evaluated. Note was made for any variation in origin of a nerve, absence of nerve, unusual branching or being replaced by another nerve. **SUMMARY.** Three out of 80 were pre-fixed lumbar plexuses. Prevalence of anatomical variation in the individual nerves ranged from 1.25–7.5%. In 48.75% plexuses documented branches on one or the other side, were absent except the femoral nerve which was present in all 80 specimens. In one specimen (1.25%) no cutaneous branches were seen for iliohypogastric nerve. In one cadaver the lateral femoral cutaneous nerve was noted to lie medially to femoral nerve, bilaterally. Early division of femoral nerve was seen in 5 lumbar plexuses (6.25%) which is highest frequency reported so far. Nervus furcalis took origin from L3 root in 3 cases. Accessory nerves other than usual branches were found bilaterally in one male cadaver from L2 or L3 roots. In one cadaver branch from genitofemoral nerve replaced ilioinguinal nerve bilaterally. **CONCLUSIONS.** Awareness about variations may help anaesthetists and clinicians in diagnosis and managing different presentations of cases of lumbar plexopathies like psoas major muscle abscess, groin pain syndrome, testicular pain, infarct of psoas muscle etc.

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*BAEZ, Ramona, Jill SCHULDT, Michael DEITRICH, Gianna WARD, Sushama RICH, Naveen B. KANDAVALLI, Bedia CASTELLANOS, and Carlos QUINTEROS. Department of Anatomy, Touro College of Osteopathic Medicine, New York, NY, 10027, USA.

Unusual Origin and Insertion of an Anomalous Fibularis Tertius: Case Report.

INTRODUCTION. The fibularis tertius muscle (FTm), a characteristic muscle to humans, may have multiple morphological variations. It is one of the four muscles of the anterior compartment of the leg (ACL) and is responsible for the dorsiflexion of the ankle and bipedal movement of the foot. It originates at the anteroinferior distal third of the fibula & interosseous membrane (IOM), shares muscular fibers with the extensor digitorum longus (EDLm) & inserts distally on the dorsal base of the 5th metatarsal as a separate tendon. **RESOURCES.** Dissection of the left lower limb of an embalmed 74y/o Caucasian male donor was performed. Findings were documented & photographed. **DESCRIPTION.** We identified an anomalous belly of FTm that measured 3cm in its widest point and 32cm in length from its origin on the head & full length of the anterior surface of fibula & IOM. It then courses to insert onto the dorsal base of the 5th metatarsal sending an additional medial tendinous slip onto the dorsal base of distal 5th phalanx. The EDLm has a small belly measuring 1.5cm in its widest point and 17.5cm in length. It has its proximal attachment into the lateral tibial condyle, IOM, and fibula. Its distal attachment is unusual with only three tendinous slips of 26cm in length, inserting on the dorsal bases of the distal phalanges of 2nd, 3rd, & 4th digits. The lateral most slip of EDLm tendon has a communicating slip to the additional tendinous slip of the FTm coursing towards the 5th phalanx. **SIGNIFICANCE.** Knowledge of variations of the FTm are of great significance to anatomists & health professionals as they can be potential sources of compression, delineation of graft sites, sensorimotor and biomechanical conditions, and dysfunctions, & possibly iatrogenic injury during medical procedures.

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Creating Photorealistic 3D Study Resources from Anatomical Specimens with Apple Reality Composer.

INTRODUCTION. The use of three-dimensional (3D) renderings of anatomical specimen as educational tools is growing in popularity. Photogrammetry is a long-standing method that may be used to create 3D models. It has recently been used to generate visual depictions of cadaveric specimens to provide users with an extended reality experience (XR). XR is a broad term that encompasses augmented reality (AR), virtual reality (VR), and mixed reality (MR). RESOURCES. Human prosected specimens were photographed initially using an iPhone 14 Pro Max and a sixth generation iPad Pro. Apple Developer's Reality Composer software program was utilized to render the images and provide an extended reality experience. DESCRIPTION. To minimize cost, we used resources available in our laboratory as props. Laboratory tools served as a revolving platform for the specimens. Model stands were used to suspend specimens as needed. Initial images were taken using an iPhone 14 Pro Max and iPad Pro 6th generation. The compass app on iPhone 14 Pro Max was used to accurately place the specimens at regular intervals of five degrees. The images were analyzed on Apple Reality Composer on a Mac. The final 3D models were stored as USDZ (Universal Scene Description) files which can be viewed on any Mac or iOS device. The overall time for processing a single 3D image was approximately about 45 minutes. SIGNIFICANCE. This economical, resource allows faculty to generate 3D models of dissections and prosections which are customized to the needs of their curriculum. Additionally, these images can develop a cost-effective XR platform eliminating the need for commercially outsourced solutions.

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*BENJAMEN, Gabriel¹, Kerolos MORCOS¹, Ashley JOHAL¹, Karma YACHUNGTSANG¹, Yaseen ELKABBANI¹, Vanessa I BATUBO¹, Ragy KAUZMAN¹, James COEY^{1,2}, Tarek ALMABROUK¹, and Kristna THOMPSON¹. ¹St. George's International School of Medicine, Northumbria University, Newcastle upon Tyne, NE1 8ST, United Kingdom; ²Department of Anatomy, St. George's University, Grenada, West Indies.
Ultrasonography Analysis of Adson's Maneuver: Insight to Thoracic Outlet Syndrome.

INTRODUCTION. Thoracic Outlet Syndrome (TOS) encompasses conditions arising from the compression of the neurovascular bundle within the scalene triangle. Despite its widespread use, the Adson's maneuver, a diagnostic test for TOS, is criticized for its high false positive rate. This study leverages ultrasonography to investigate the anatomical changes in the scalene triangle and the radial artery's diameter induced by Adson's maneuver, aiming to enhance diagnostic accuracy. METHODS. A cohort of 33 individuals (14 males and 19 females), aged 18 to 34 years and without TOS, underwent ultrasonographic examination using a GE LOGIQ e system with a linear transducer. Measurements focused on the scalene triangle and radial artery diameter under both neutral and Adson's maneuver conditions. Statistical analyses were conducted to explore differences between these measurements during the maneuver's standard and modified applications. SUMMARY. Our analysis revealed a notable increase in the radial artery diameter, escalating from a neutral state average of 0.247 ± 0.050 to 0.347 ± 0.054 during the execution of Adson's standard maneuver, marking this change as statistically significant ($p < 0.001$). In contrast, measurements of the scalene triangle dimension remained statistically consistent, with minor variations from a neutral position average of 0.347 ± 0.055 to 0.352 ± 0.643 during the maneuver, which did not reach statistical significance ($p = 0.371$). These findings underscore a discernible anatomical response to the Adson's maneuver, evidenced by radial artery compression, while the scalene triangle's dimensions appear unaffected. CONCLUSION. The study concludes that while Adson's test does not alter the scalene triangle dimensions, the significant change in radial artery diameter confirms a compression. These results prompt further investigation into the specific structures affected by compression during Adson's maneuver, potentially refining the diagnostic process for TOS.

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Novel Active-Learning Method for Teaching Brachial Plexus Injuries: A Mixed-Methods Study.

INTRODUCTION. Clinical deficits of brachial plexus injuries are challenging for students to learn. Active learning modalities have been used to teach the brachial plexus, but it is unknown which strategies are more effective, and why, in teaching functional deficits of brachial plexus injuries. The purpose of this study is to investigate whether this novel instructional method impacts student learning of brachial plexus injuries and which aspects of the activity may be most effective.

METHODS. Eastern Virginia Medical School students used colored tape to create a brachial plexus model denoting corresponding nerve root contributions and individual nerve functions. Working in small groups with faculty guidance, students associated clinical symptoms with various brachial plexus lesions using their models. Brachial plexus clinical knowledge tests were administered before and after sessions to obtain pre- and post-session test scores. A numeric code was utilized to match test scores and paired samples *t*-tests determined differences in pre- and post-test scores. Open-ended post-test survey items provided qualitative data for session feedback.

SUMMARY. Student post-session clinical knowledge test scores were significantly higher than the pre-session test scores ($t(127) = 9.68, p < 0.001$). Qualitative data yielded three main aspects of the activity students felt improved their test-taking ability: (1) Easier visualization of nerve root contributions, (2) Assigning sensory and motor functions to each nerve, and (3) Discussing the lesions with their peers in groups.

CONCLUSIONS. Students improved their ability to independently complete complex, clinically based brachial plexus exam questions after completing the session and identified specific aspects of the activity they felt improved their learning. These findings suggest this may be an effective way to teach clinical deficits of brachial plexus injuries in the context of a clinical anatomy course.

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Utilization of 3D Render Technology in the Generation of Anatomical Variant Models.

INTRODUCTION. Anatomical instruction typically utilizes various modalities to ensure effective learning. A potentially novel and cost-effective way of teaching and highlighting interesting anatomical variants found incidentally in the laboratory exists in the form of 3D rendering software available on mobile devices. **RESOURCES.** An aberrant left vertebral artery was observed during the routine dissection of a male cadaver in the Gross Anatomy Laboratory. "RealityComposer," an Augmented Reality application developed by Apple Inc., was utilized to scan the variant artery in situ and create a photorealistic model for manipulation on an iPhone. **DESCRIPTION.** An anatomical dissection of the aberrant left vertebral artery from the aortic arch to the C5 vertebral level was conducted with the assistance of 2 anatomy faculty members. The order of the aortic arch branches was as follows: right brachiocephalic artery, left common carotid artery, left vertebral artery, and left subclavian artery. A photorealistic model of the variant artery's path within the cadaver was rendered utilizing the "RealityComposer" app. **SIGNIFICANCE.** The documented abnormality occurs in only about 2-6% of the population, making it relatively rare. It is unlikely for most students to encounter it in their careers. Using 3D rendering software to document such an abnormality in a way that enables more student engagement helps pave the way for easier exposure to other rare abnormalities. Additionally, experimentation with 3D rendering software can help refine its use to become more efficient in the documentation of cadavers, potentially leading to the creation of a robust database of 3D rendered cadavers and organs for general use. Such a database may prove helpful in increasing accessibility to those who may not have access to an anatomy lab and those who have difficulty visualizing 3D objects.

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*BISHOP, Keith N.¹, Alice VILLALOBOS¹, Ananya POTU², Sathyak SAINI², Najah HUSSAIN², Valeria MUCHARRAZ², and Gurvinder KAUR¹. ¹Department of Medical Education, Texas Tech University Health Sciences Center, Lubbock, TX, 79430, USA; ²Graduate School of Biomedical Sciences, Texas Tech University Health Sciences Center, Lubbock, TX, 79430, USA. Cardiac Ultrasound Images vs 3D Models: A Study to Identify Specific Structures.

INTRODUCTION. The use of ultrasound (US) has become universal in medical school curricula. Developing the skill to perform and interpret cardiac US is difficult. The various US views display cardiac structures vastly differently, but the student must correctly recognize all structures. This study aimed to investigate students' ability to identify the same heart structure in either a 3D model or an US image. **METHODS.** As part of the 1st yr. medical school cardiac unit, students received 30 minutes of hands-on US training using a standardized patient. During the training session, each student was taught multiple views (parasternal long (PLAX), short axis (PSAX), apical 4-chamber view) and the perspectives and structures visible from each view. As part of this training, they were each required to capture a PLAX image for submission. Immediately after the US training session, students were asked to participate in this study. They were randomly assigned to identify the PLAX view and the same two heart structures within that view in either a 3D heart model or a printed US image. **SUMMARY.** A total of 93 students participated in this study. Students who were quizzed on the 3D model were significantly more likely to correctly identify the structures compared to students quizzed on the US image ($p < 0.0001$). There was no difference in the ability to correctly recognize which view was represented in the model or image ($p = 0.1021$). **CONCLUSIONS.** After only viewing US images on the monitor during their training session, students who were tested with the 3D model were more likely to correctly identify cardiac structures. The fact that there was no difference between the two groups' ability to recognize the identical view of the model and image suggests that the model represents the heart correctly. These results indicate a 3D model created in the same anatomical orientation as an US image is an impactful teaching tool that facilitates students' understanding of heart anatomy.

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Anthropometric Analysis of the Periocular Feature: A Photographic Study.

INTRODUCTION. The orbital region is a key determinant in the perception of facial attractiveness, youth, and good health. In cosmetic surgery, maintenance of these aesthetic features is important in obtaining satisfactory aesthetic results. Lamentably, there is a dearth of information related to these values in Indian Americans, leading to surgeons being forced to use statistical data from Caucasians in their decision-making. The primary aim of the study was to establish gender-specific eyebrow and eyelid anthropometric data for Indian Americans. To quantify the upper facial symmetry, the patient's measurements were compared with normal values for respective ethnic groups. **METHODS.** A total of 200 Indian American subjects, (100 males and 100 females), aged 19 to 26 years old, were randomly chosen and evaluated. Standard photographs were taken and the eyebrow thickness, apex-to-lateral limbus distance, apex-to-lateral canthus distance, inter-brow distance (IB), medial end of the eyebrow to medial canthus, lateral end of the eyebrow to lateral canthus, eyebrow height, eyebrow apex inclination, and pretarsal skin height were measured. The measured values were evaluated by an independent t-test to determine racial and sexual dimorphism. **SUMMARY.** A significant difference was found between Indian Americans and Caucasian groups for eyebrow apex to lateral limbus distance, medial end to medial canthus, pretarsal skin height, eyebrow height, and eyebrow apex inclination. Male groups showed significant differences for eyebrow apex to lateral limbus distance. Sexual dimorphism was found for all measurement categories. **CONCLUSIONS.** Our study has contributed to the sciences by quantifying the dimensions of the periorbital fissure in the Indian American population. Race and gender differences existed for certain measurements between the groups. Since these factors can impact the surgical decision, this highlights the requirement for an individualized approach to the patients to obtain a satisfactory result.

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Pre-lab Videos Reduce Cognitive Load and Increase Efficiency in the Gross Anatomy Laboratory.

INTRODUCTION. Advances in technology can help students engage with anatomy and integrate their anatomical knowledge with computer tomography (CT) imaging. However, there is a learning curve for both faculty and students when it comes to utilizing these technologies effectively to increase efficiency. The present study aimed to investigate the effects of pre-lab training videos on undergraduate medical students' and biomedical engineering graduate students' cognitive load, confidence, and efficiency in laboratory. METHODS. Students watched pre-lab training videos on how to access and utilize the Syngo program on anatomical donors in the gross anatomy laboratory, and then collected and evaluated CT images from anatomical donors. Students completed surveys at the end of their respective courses which included questions about cognitive load, confidence, and efficiency in the laboratory. SUMMARY. Student surveys show that 90% of M1 students and 100% of BME student enjoyed working with the Syngo programs, felt confident they could now correctly identify anatomical structures on CT imaging, and felt they were more efficient in lab because of the pre-lab training videos. This also included manipulating the software to utilize the correct screen or tool. CONCLUSIONS. First year medical students and biomedical engineering students benefit from pre-lab training videos by reducing their cognitive load, increasing their confidence working with Syngo software, and increasing efficiency in lab. This approach could be expanded to include more systems and measurements.

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Digastric Abductor Pollicis Brevis: A Rare Variant.

INTRODUCTION. Surgical and anatomical literature documents variations in the extensor forearm. These anatomical variations may be implicated in the management of inflammatory diseases and reconstructive surgeries of the hand. RESOURCES. During routine dissection of the upper limbs of a male cadaveric donor used for teaching purposes at Weill Cornell Medicine, a variant muscle was observed. Images of the variation were recorded, and measurements documented. DESCRIPTION. The proximal fleshy belly of the digastric abductor pollicis brevis originated from the distal third of the posterior surface of the radius, lateral to the abductor pollicis longus. The distal belly was in the thenar eminence and inserted in the extensor expansion and the proximal phalanx of the thumb. The intermediate tendon was located lateral to the abductor pollicis longus. The two bellies of the variant muscle were supplied by the nerves of the flexor and extensor compartments of the forearm. SIGNIFICANCE. The variation observed in our study may have clinical implications ranging from potential nerve compression, prevention of tendon rupture and potential graft material for aesthetic surgery. This study may aid orthopedic surgeons to prevent inadvertent injuries of the additional muscle slips. Future in vivo investigations could improve our understanding of the functionality of this rare variant.

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Development of a Novel Teaching Tool in Living Anatomy: Mr. Bones Says Review.

INTRODUCTION. Dissection serves as gold standard for delivery of anatomy content. However, pedagogical theory favors additional modalities in the effective transmission of anatomy knowledge to health professional students. Alternate and engaging methods, including game-based learning and living anatomy adjuncts, are gaining popularity to supplement print-based review material and are worthy of further exploration. METHODS. Musculoskeletal anatomy is part of the 1st year medical curriculum. Students were invited to participate in a living-anatomy gamified review called "Mr. Bones Says". This 1.5-hour session reviewed 1) muscle primary actions 2) innervations of muscles, and 3) nerve lesions through having students physically demonstrate movements related to the aforementioned list. Anonymous, identical pre/post-activity quizzes and surveys were analyzed. SUMMARY. A total of 83 students participated in the session. There were no differences on pre vs. post activity 12-point quizzes (pre: 8.24 avg, std: 1.97; post: 8.71 avg, std: 2.00; unpaired t-test: $p = 0.14$). Subjective student confidence rated on a 5-point Likert scale rose to Bonferroni-corrected statistical significance in several domains, notably increased confidence with nerve origins (pre: 3.02 avg, std: 1.18; post: 3.86, std: 1.21; unpaired t-test: $p < 0.0001$, size of effect: 0.84) and cutaneous innervations (pre: 3.12 avg, std: 1.16; post: 3.84 avg, std: 1.12; unpaired t-test: $p < 0.0005$, size of effect: 0.72). Students also agreed that this activity was useful to identify gaps in their knowledge (4.59 avg, 5-point Likert scale, std: 0.73) CONCLUSIONS. Low-cost anatomy educational adjuncts are worth exploring as a supplement to anatomical dissection, most notably in building student confidence. Although no significant performance improvement was found with this one-time intervention, further exploration of living-anatomy curricular supplementing clinically oriented anatomy for medical students is warranted.

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Duplicated Femoral Veins: A Cadaveric Mapping and Comparison of Gender Differences.

INTRODUCTION. Duplicated femoral veins are prevalent in the general population and have clinical implications regarding deep vein thrombosis and the potential for catheterization. The literature on the morphological mapping of the vein is not robust. The study aims to analyze a cadaver dataset and compare its findings with existing literature, focusing on categorizing anatomical variants and conducting a gender-based comparison. METHODS. 23 male and 23 female embalmed cadavers were assessed after four months of medical school anatomy with the thigh vasculature largely preserved. Femoral veins were individually inspected without harvesting, measured with calipers, and photographed with a standard iPhone. Datasets were analyzed using ANOVA. SUMMARY. After assessing the literature and observations from the current study, duplicated femoral veins were categorized into monotruncular and bitruncular variants, which may be further divided by a dominant femoral trunk, deep femoral trunk, or axiofemoral vein trunk. There are no significant differences between the means of other femoral vein studies to the current one. However, males are more significantly predisposed to duplicated femoral veins compared to females. CONCLUSIONS. The findings in the present study align with previous attempts to map similar data in the literature. Additionally, it has been observed that males have a sexual preference for the duplicated vein. This information helps clinicians appreciate the intricacies of the femoral vein, facilitating precise catheter placement, and providing an accurate assessment of the risk factors associated with deep vein thrombosis.

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Evaluation of a Multi-Modal AI System in Clinical Anatomy: An International Multi-Center Study.

INTRODUCTION. To demonstrate the application of a novel Artificial Intelligence (AI) tool in anatomy, radiology and clinical practice. With a focus on cardiovascular anatomy, our initial study built on a proof-of-concept study conducted with NHS colleagues in the UK to compare the 'AIATELLA' AI with Consultant Cardiologists' assessment of aortic root and valve planimetry. **METHODS.** The study compares clinicians' appraisal of normal vascular anatomy and pathology with that of the AI. Accuracy, speed of analysis, and reproducibility were the focus, along with the inter and intra-operator variability paramount to clinical practice. Three NHS Consultant Cardiologists and the 'AIATELLA' AI algorithm—trained on 35 patients' DICOM images—conducted 15 measurements per patient dataset using cvi42[®] software. Statistical analyses, including descriptive and ANOVA, were performed using IBM SPSS to compare group measurements. **SUMMARY.** AIATELLA demonstrated statically significant (ANOVA) superiority when compared with manual methods. Analysis of Interclass Correlation Coefficient (ICC) metrics indicates high concordance across all measurements (overall ICC: 0.98), with AI matching the accuracy of cardiologists while delivering results more than 100 times faster. Notably, an average measurement time of 2.6 seconds significantly outpaced human observers. **CONCLUSIONS.** Variability in human measurements, attributed to factors like experience and fatigue, contrasts with AI's uniform standard. Statistical analysis has confirmed AIATELLA precision and speed, with a large effect size indicating a substantial variance in measurement times attributable to inter and intra-operator variability. This suggests AI's role in standardising measurements, reducing error margins, and offering consistent output quality. AI tools such as AIATELLA can improve diagnostic accuracy, efficiency, and patient care standardisation, complementing but not replacing cardiologist expertise.

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A Case Report of Right Gonadal Vein Anatomical Variation with Drainage into Right Renal Vein.

INTRODUCTION. Drainage of the right gonadal vein into the right renal vein is an anatomical variation found in 8-10% of patients in case studies, however, some sources claim this variation to be found as infrequently as 1.8%. With this project, we hope to describe the anatomical variation of the right ovarian vein found during routine anatomical dissection, as well as explore the prevalence and clinical significance of the variation. **RESOURCES.** IRB exempt status and approval by LMU-DCOM Anatomical Donation Program was obtained. Consent was given by the donor for education, research, and photography. Routine dissection of the posterior abdominal wall was carried out per Grant's Dissector 17th ed. **DESCRIPTION.** An 83-year-old female, formalin-fixed, whole-body donor in the LMU-DCOM anatomy laboratory was routinely dissected in the Medical Gross Anatomy course which resulted in an incidental finding of the right ovarian vein draining into the right renal vein. Photographs were obtained and a literature review was conducted to assess the prevalence and clinical significance of the anatomical variation. **SIGNIFICANCE.** By altering the proximal connection of the right gonadal vein, there may be an increased risk of retrograde blood flow through the right gonadal vein, possibly contributing to pathology, such as venous reflux and pelvic congestion syndrome. Bringing awareness to these anatomical variations will provide insight into possible causes of chronic pelvic pain as well as provide knowledge of the different locations of ovarian veins for abdominopelvic procedures and imaging.

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Anatomical Variations and Anomalies of the Uterine Tubes - Atlas of Drawings for 3D Modelling.

INTRODUCTION. Many aspects of the uterine tube physiology and morphology remain unknown. One of the reasons is that the successes of assisted reproduction techniques made uterine tube research less attractive and urgent. Nevertheless, a thorough understanding of anatomical variations and congenital anomalies of the uterine tubes (UTAVsCAs) will provide more effective tools for successful fertility management. RESOURCES. Adapting anatomy, histology and embryology teaching to technologically driven modern times is inevitable. The main challenge for students is implementing their imagination to understand the intricacies of anatomical structure and organ development. The best resources to overcome this obstacle are 3D-printed models, 3D animations, the use of virtual reality, and the incorporation of gamification elements. Nevertheless, there is still a place for creating original drawings, which can also serve as blueprints for the further creation of 3D models and animations. We used historical literature, cadavers, and samples obtained during surgeries to prepare sketches, which were further coloured and refined. DESCRIPTION. We created an atlas of drawings depicting different UTAVsCAs, e.g., total unilateral, segmental, mid-segmental agenesis, accessory uterine tube, or hydatid cyst of Morgagni. Subsequently, these drawings were digitalized for further 3D modelling. SIGNIFICANCE. These education tools will strengthen knowledge retention regarding UTAVsCAs, broaden clinicians' differential diagnostic considerations, and lead to better decision-making in fertility treatment. This study was supported by grants from the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences (VEGA), numbers 1/0347/24 and 1/0625/23.

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Ultrasound Guided Subcutaneous Tissue Dissection in Cadavers.

INTRODUCTION. The aim for this project was to compare the ability to identify and dissect subcutaneous tissue layers in cadaveric specimens under ultrasonographic (US) guided dissection. Subcutaneous tissue was selected as it is often overlooked and the terminology associated with subcutaneous tissue in literature, publications, and published anatomical terminology databases differs. RESOURCES. Identification and visualization of fascial and adipose layers was performed on multiple cadaveric specimens regionally on fresh and embalmed preservation methods. Pins were inserted to varying depths manually under US guidance with a 6-13MHz linear probe. Accuracy of pin placement was confirmed through visual observation using sharp dissection. DESCRIPTION. Under US guidance regionally (e.g., leg, thigh, gluteal region, etc.), a series of color-coded pins were inserted to depths associated with the membranous layer(s) of subcutaneous tissue (superficial fascia), and the investing layer of fascia (deep fascia). Comparison of tissue visibility in the US images and ability to dissect the various layers based on preservation method was recorded. SIGNIFICANCE. Utilization of US with dissection offers an accurate method to identify and demonstrate the layering of subcutaneous tissue. Consideration of inclusion of the proposed methodology in medical curricula may prove beneficial to student comprehension of the clinical relevance, surgical approach, and treatment of subcutaneous tissue of the body. It is hoped that our methodology improves inter-disciplinary communication between researchers and educators, physicians and surgeons, and manual and myofascial therapists.

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A Game-Changer in Anatomical Visualization: Glasses-Free 3D Technology in a Holographic Atlas.

INTRODUCTION. Introducing innovative 3D visualization tools in medical education is pivotal for enhancing learning experiences. The authors present a 3D holographic anatomy atlas developed to leverage the capabilities of novel spatial 3D tablet technology, requiring no glasses for depth perception. This atlas offers immersive anatomical visualization, providing students with an unparalleled depth of view into dissections. **RESOURCES.** The backbone of this atlas is a 3D light field screen technology integrated into a tablet that utilizes eyewear-free 3D display technology and an AI face-tracking system. Developed within the Unity environment, this atlas is advanced in visual capabilities and versatile, with ease of portability across various platforms, ensuring broad accessibility and catering to a wide audience within medical education. **DESCRIPTION.** The atlas includes an extensive collection of fully 3D models derived through photogrammetry of dissected specimens, offering a comprehensive human body exploration. Additionally, many specimen images have been processed to result in textured 3D meshes, enriching the educational content beyond traditional 2D presentation. This methodical approach to atlas content creation ensures that users can access a wide range of anatomical structures in awe-inspiring detail. **SIGNIFICANCE.** This 3D holographic atlas aims to bridge the gap between theoretical knowledge and visual understanding of anatomy beyond existing tools. Educators and students can explore the complexities of the human body in a manner that enhances comprehension and retention of knowledge. This approach to medical education has the potential to improve learning outcomes significantly and set a new standard for presenting anatomical content.

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Spinal Cord Tract Degeneration Described in a Cadaver with a Lesion of the Left Cerebral Hemisphere.

INTRODUCTION. The value of cadaveric donations for anatomic study in undergraduate medical education is currently a topic of debate. Incidental and unexpected pathologic findings discovered during routine dissection provide an invaluable opportunity for learning and discovery for students. **RESOURCES.** Cervical, thoracic and lumbar spinal cord samples were obtained from a formalin-embalmed cadaver with an extensive lesion of the left cerebral hemisphere, and a control cadaver without CNS lesions. Samples were sectioned, stained, and imaged using HistoWiz. Luxol fast blue was used to stain myelin and immunohistochemistry targeting glial fibrillary acidic protein (GFAP) was used to elucidate astrocytes. **DESCRIPTION.** Two territories exhibiting reduced myelin were observed in the left anterior and right lateral funiculi of the spinal cord, at cervical and thoracic levels only. Importantly, these territories corresponded to the predicted locations of the left anterior (ACST) and right lateral corticospinal tracts (LCST), respectively. Upregulation of GFAP, a characteristic response of reactive astrocytes, was also noted in these territories. **SIGNIFICANCE.** Together, our data provide evidence of axonal loss and glial scar formation in the territories of the left ACST and right LCST in a cadaver with a lesion of the left cerebral hemisphere. Further, the restriction of axonal loss to cervical and thoracic levels suggests that the upper motor neurons most affected by the lesion were those residing in the superior and lateral regions of the left precentral gyrus. This interpretation is consistent with the gross appearance of the cadaver's brain lesion. This report demonstrates that formalin-embalmed cadaveric tissue used for anatomy education can be further utilized to support other basic science disciplines, such as histology, neuroanatomy, and pathology.

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*JAWAD, Ihab¹, Nader EL HAJJ¹, Chibuikem ANEKWUONYE¹, Zain AL-SHAMIL¹, Masih ASADI¹, Muhammed NIDHAL¹, James COEY^{1,2}, Tarek ALMABROUK¹, Chinedu ENWEREM¹, and Haider HILAL¹. ¹St. George's University School of Medicine, Newcastle upon Tyne, NE1 8ST, United Kingdom; ²Department of Anatomy, St. George's University, Grenada, West Indies. A Comparative Analysis of Patellar Ligament Length in Athletes and Non-Athletes.

INTRODUCTION. The patellar ligament's role in knee biomechanics, affecting extension efficiency and joint stability, highlights the significance of its length variations. These variations may influence athletic performance, injury risk, and surgical choices, such as for ACL reconstruction. However, the link between patellar ligament length (PLL) variability, physical activity, and anatomical distinctions, especially between athletes and non-athletes, is not well-understood. Our study addresses this by comparing PLL lengths across these groups using ultrasound imaging, aiming to enhance personalized medical strategies and rehabilitation approaches in orthopedics and sports medicine. **METHODS.** This study compared patellar ligament length (PLL) between 18 athletes and 22 non-athletes, divided into sedentary (N=9) and active (N=13) groups, using non-invasive ultrasound imaging with a GE LOGIQ e system and a 12-15 Hz linear transducer. Measurements were taken with participants' knees at a 30° flexion, using a digital caliper for accuracy on both legs. Height and weight were also recorded to examine correlations with PLL. **SUMMARY.** The analysis identified significant variations in patellar ligament length (PLL) across different groups and limbs. Notably, there were discernible differences between athletes and non-athletes, as well as between the dominant and non-dominant legs within each group, indicating the influence of physical activity on PLL. Furthermore, a significant correlation was established between the level of physical activity and PLL measurements, reinforcing the impact of regular athletic engagement on ligament dimensions. **CONCLUSIONS.** The analysis highlighted significant PLL variations related to physical activity, influencing clinical practices for ACL reconstruction. This suggests the necessity for personalized treatments based on PLL differences, aiming to improve surgical outcomes by tailoring approaches to individual patient profiles.

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*KLEIN, Martin¹, Mária CSÖBÖNYEIOVÁ¹, Ivan VARGA¹, Paulína GÁLFIOVÁ¹, Stanislav ŽIARAN², Claudia FEITSCHEROVÁ¹, Katarína BEVÍZOVÁ³, Ľuboš DANIŠOVIČ⁴, and Marcela KUNIAKOVÁ⁴. ¹Institute of Histology and Embryology, Faculty of Medicine, Comenius University in Bratislava, Bratislava, 81108, Slovakia; ²Department of Urology, Faculty of Medicine, Comenius University in Bratislava, and University Hospital Bratislava, Bratislava, 83305, Slovakia; ³Institute of Anatomy, Faculty of Medicine, Comenius University in Bratislava, Bratislava, 81108, Slovakia; ⁴Institute of Medical Biology, Genetics and Clinical Genetics, Faculty of Medicine, Comenius University in Bratislava, Bratislava, 81108, Slovakia. Characterization of Decellularized and Recellularized Foreskin Scaffolds for Tissue Regeneration.

INTRODUCTION. Tissue decellularization and subsequent recellularization have been widely used to prepare bioscaffolds, which have a vast spectrum of clinical applications and address the low regenerative capacities of many human organs. The presented study aimed to prepare and characterize decellularized bioscaffolds from human foreskin and recellularize them using somatic stem cells (SCs), developing a viable graft for soft tissue regeneration. **METHODS.** Human foreskins (n=20) were decellularized using enzymatic and detergent-based protocols. The effectiveness of cell removal was assessed by normal histology, immunohistochemistry (IHC) and scanning electron microscopy (SEM). The presence of residual DNA was quantified by spectrophotometry. Samples were recellularized by adipose tissue-derived SCs and evaluated after 21 days using morphological methods. **SUMMARY.** Our examination revealed complete removal of cell nuclei, indicating thorough decellularization and successful preservation of the extracellular matrix (ECM). Control foreskin samples contained significantly higher DNA concentrations than experimental samples, with residual DNA content of 4.0±5.6 ng/mg tissue for the enzymatic protocol and 5.2±7.3 ng/mg tissue for the detergent protocol (p<0.001). Following recellularization, microscopic analysis demonstrated the robust adherence of SCs to the matrices and substantial cell ingrowth, indicating successful integration. **CONCLUSIONS.** Our findings confirm the feasibility of foreskin decellularization using enzymatic or detergent methods, preserving the natural ECM structure and composition while ensuring DNA removal. This successful recellularization underscores the potential of this approach for tissue engineering and graft applications. This study was supported by grants from the Scientific Grant Agency of the Ministry of Education, Science, Research and Sport of the Slovak Republic and the Slovak Academy of Sciences (VEGA), numbers 1/0347/24 and 1/0625/23.

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Comparison of Dye Spread in Halstead, Gow-Gates and Vazirani-Akinosi Techniques: A Cadaveric Study.

INTRODUCTION. Mandibular anesthesia is essential to numerous dental procedures. The standard inferior alveolar nerve (IAN) block or Halstead technique, is utilized to anesthetize mandibular teeth and supporting structures; however, this approach fails in ~15-30% of cases. The Gow-Gates and Vazirani-Akinosi techniques are alternative approaches to the Halstead approach, yet their success rate remains inconsistent in the literature. Low success rates are attributed to anatomical variation in the location of the mandibular foramen and sensory innervation. Dye spread has been evaluated for the Halstead technique to determine the extent of sensory nerve staining but not for other techniques. This study aimed to compare the range of dye spread between the traditional Halstead, Gow-Gates and Vazirani-Akinosi techniques. Moreover, we assessed the variation in the location of the mandibular foramen. METHODS. Preliminarily, three fresh-frozen cadaver heads were injected bilaterally (n=6) with 2% methylene-blue dye utilizing a different nerve block technique for each head. Dissection of cadavers evaluated the extent of dye spread and nerve involvement within the infratemporal fossa. Bilateral mandibles from embalmed (n=16) and fresh-frozen heads (n=6) were measured to determine variation in the location of the mandibular foramen. SUMMARY. Assessment of dye spread revealed that the Vazirani-Akinosi technique stained the origin of IAN. These findings suggest that the Vazirani-Akinosi technique could minimize anesthetic failure by targeting the origin of variation in sensory innervation, V3. Measurements indicated a significant number (p<0.05) of mandibular foramina were located anterior to the midpoint of the ramus. CONCLUSIONS. The impact of this study suggests that alternative approaches need to be considered to increase mandibular nerve block success rates and patient comfort.

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We've Got Your Back: A Multi-Modal Approach for the Assessment of the Sublaminar Ridge.

INTRODUCTION. Spinal decompression surgery for treatment of lateral stenosis of the lumbar spine is linked with low success rates. One explanation may be nerve impingement caused by the hypertrophied sublaminar ridge (SLR), the attachment site for the ligamentum flavum. However, its location beneath the vertebral pedicles makes it challenging to visualize. This study aims to explore visual, haptic, and quantitative methods for evaluation of the SLR. METHODS. Spinal blocks (T12 to S1) were extracted from 14 soft-fixed cadavers. Computed Tomography (CT) images were taken using a high-resolution protocol (slice thickness of 0.625 mm) to visualize the SLR on two platforms: 3D reconstructions on Amira (Version 6.3, Thermofisher Scientific) and 2D planar images on Volume Viewer (General Electric). Development of a measurement protocol quantified three characteristics of the SLR: height, angle, and degree of stenosis from the vertebral lamina. Additionally, the SLR was visually assessed using coronal images on Amira, and haptically assessed with forceps. SUMMARY. Preliminary data for 3D reconstructions (n=36 SLRs) were analyzed on SPSS (Version 29). The mean \pm SD for SLR height, angle, and degree of stenosis were 1.78 mm \pm 0.56 mm, 23.9° \pm 8.9°, and 22.6% \pm 1.3%, respectively. Intra-class correlation coefficient estimates of 0.812 and 0.831 for SLR height and angle respectively indicate a good degree of inter-observer reliability. Qualitative assessment of visual and haptic approaches revealed that 3 or more observers of 5 reached consensus in 60% of SLRs evaluated, with consensus being defined as an observer reaching agreement between the two senses. CONCLUSIONS. This study introduces methods to quantify the SLR and identify its presence haptically and visually, appreciating various modes for evaluation. Enhanced understanding of the SLR's structure and clinical implications brings exciting opportunities to improve spinal interventions and surgical education.

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A New Mobile Application (App) for Training in Neurosurgery.

INTRODUCTION. Cadaveric dissections are of paramount importance during residencies in Neurosurgery. The aim of this study is to describe a novel mobile application (app) used during cadaveric dissections with residents in neurosurgery. **RESOURCES.** The mobile app was created and designed to guide and grade dissections with residents in neurosurgery from the first through fourth year following a cranial base curriculum composed by different neurosurgical approaches to be performed within the lab. **DESCRIPTION.** The dissections are scheduled, guided, and graded using the app being accessed with different portable devices such as, smartphones, tablets and computers. The app provides guidance during seventeen hands-on dissections starting from placement of burr holes and small craniotomies to more challenging and invasive approaches, for instance the Orbitozygomatic approach. The residents log in into their accounts to access the theoretical and step-by-step mentorship displayed on the app before starting the appointment within the lab. Each approach presents a tab with meticulous and detailed descriptions for the dissection to be done using high-quality and labeled pictures of cadaveric dissections previously performed in our lab. The app also provides the score for the dissections which grades the resident taking into account the approach performed and structures exposed and explored. The grading process is performed during and at the end of each session in the lab with 0-10 points, the grading and feedback for their performance is provided by an anatomist who is responsible for offering additional guidance during the dissections. **SIGNIFICANCE.** Mobile apps have been frequently used for educational purposes offering not only flexibility for users and learners, but also democratizing the access of reliable and accurate content, in particular for those institutions lacking resources and infrastructure to integrate cadaveric dissections and hands-on practices in their curricula.

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Suturing Anatomy and Surgery: Integrating Surgeons into Preclinical Medical Anatomy Dissection Labs.

INTRODUCTION. While medical students have long learned gross anatomy as part of their pre-clerkship curriculum, some do not recognize the clinical utility of anatomical structures on their future clinical practice. This study aimed to identify if including surgical faculty and residents in the anatomy dissection lab helped to improve the student learning experience at Rutgers New Jersey Medical School. **METHODS.** During the gastrointestinal block, surgeons participated in dissections, providing clinical insights to second-year medical students. Additionally, a clinical correlations booklet was introduced that presented relevant surgical concepts, including surgical pathologies and interventions, related to anatomical structures. Together, students discussed these concepts with surgeons and related them to their dissections of human body donors. Students and surgeons were able to identify donors with previous procedures, including a Whipple procedure and hernia repair. A survey was sent to the students to explore their perception of these surgical additions to the course. **SUMMARY.** Survey data from the 27 students who responded revealed 81% strongly agreed or agreed that the presence of surgical faculty made their anatomy classes more enjoyable and 89% of students strongly agreed or agreed that the integration of surgical faculty was "helpful." Finally, 82% strongly agreed or agreed that it provided them with the opportunity to ask and discuss their surgery-related questions. **CONCLUSIONS.** Most students enjoyed the integration of surgeons into pre-clerkship anatomy education. The integration of clinicians should be expanded to other body systems, and ways should be explored to improve the experience. Further research should investigate if the early clinical additions improves students' perceived preparedness and performance in clerkships, and if it increases their interest in surgery as a career.

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Construction and Validation of a Board Game as a Tool for the Learning Processes of Joint Anatomy.

INTRODUCTION. Board games are excellent tools in the anatomy teaching process within universities as they allow for playful, interactive and motivating learning. Based on these premises, the objective of this research was to investigate the effectiveness of using a board game in the practice of teaching anatomy of the joint system. METHODS. A descriptive, quasi-experimental study with a quantitative approach was carried out. To assess learning, a board game with 54 cards was created and applied. Participants completed a pre-test, a post-test and a long-term test six months after using the joint anatomy game. SUMMARY. A statistically significant difference was observed in learning after using the board game when purchasing the control group versus the traditional one ($p < 0.01$). Regarding long-term learning, there was long-term retention of knowledge by students using the game when compared to the traditional group ($p < 0.05$). Furthermore, there was an increase in correct answers to the questions worked on compared to the pre-test, post-test and long-term test (six months). The use of the joint system game promoted an increase in the accuracy of questions worked on as the exams were administered. The participation, motivation, engagement and spirit of healthy competition of the students throughout the process of applying the game in the classroom were also notable. CONCLUSIONS. It was found that using the board game promotes short and long-term learning of joint anatomy.

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Plaques Discovered in the Spinal Cord Region of Human Anatomical Donors after a Full Laminectomy.

INTRODUCTION. Laminectomy procedures are commonly performed in gross anatomy to help educators and students visualize internal features associated with the spinal cord. Plaques are periodically found adhering to the meninges. Past studies have identified these plaques as arachnoid calcifications. The purpose of this pilot study is to document the specific locations of plaques and seek to identify an association of the plaques to the cause of death in a human donor population. METHODS. Laminectomies were performed on 30 whole-body, formalin fixed anatomical donors from the cervical to sacral regions using techniques described in Grant's Dissector 17th ed. Spinal cords were reflected to reveal the anterior side. The number of plaques and their location on the spinal cord was documented and photographed. The largest plaque of each donor was collected for future analysis. The cause of death of the donors were collected. SUMMARY. By successfully completing 30 full laminectomies from the cervical to the sacral regions, the research team observed many of the human donors to obtain plaques. The plaques were mainly concentrated in the thoracic and lumbar regions on the posterior side. By performing this study, it will help increase our understanding related to the prevalence of the plaques and their potential impact on patients. CONCLUSIONS. Plaques were observed in 16 donors. Of the 16 donors, five donors displayed plaques on both the posterior and anterior side of the spinal cord, specifically in the thoracic and lumbar regions. There was an increased association of plaques when "neoplasm" was mentioned in the cause of death.

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A Fresh Approach to Anatomy Integration into an Occupational Therapy Elective Course.

INTRODUCTION. As clinical courses progress, foundational concepts, such as gross anatomy, should be further developed. Understanding anatomy for healthcare providers is of utmost importance for all aspects of patient care. Our students requested opportunities to acquire a deeper understanding of the upper extremity (UE) to better prepare for a career in rehabilitation specifically treating elbow, wrist, and hand conditions. Therefore, the purpose of this project was to design a course to provide advanced practice skills related to UE anatomy, diagnosis, treatment, and rehabilitation for occupational therapy (OT) students. **RESOURCES.** Fresh cadaveric specimen dissection, mid-humerus to finger tips, were used to promote a higher level of understanding of UE anatomy that could be applied to all aspects of care. Students were provided resources to review the UE, such as videos and a dissection guide to direct the dissections. **DESCRIPTION.** We developed a 2-week elective course that provided advanced practice knowledge and skills with the integration of fresh cadaveric specimens. The benefit of fresh specimens is their life-like qualities allowing the students to practice clinical skills while dissecting to appreciate the anatomy related to UE conditions. The anatomy was reviewed and instruction was provided prior to dissection. At each stage, appreciation for the anatomy and related diagnosis were covered in depth. **SIGNIFICANCE.** During this course, students gained a deeper understanding of UE anatomy, developed dissection skills, and applied what they learned to classroom content. The course was effective for increasing knowledge in this content area in an engaging manner. Additionally, the course supported active, diverse learning styles by offering content in several different methods. This course could be implemented into other programs to enhance students' clinical reasoning and ability to treat UE conditions by directly linking this learning to the related anatomical structures.

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Measuring Change in Communication Competency Domains in the Medical Gross Anatomy Laboratory Context.

INTRODUCTION. While adoption of competency-based medical education for resident training is well documented, it is less common in preclinical medical education. The gross anatomy laboratory is an opportune venue to implement competency assessment during preclinical training. This mixed-methods research study determined how first-year medical student self- and peer-assessments of communication in the anatomy lab change over time and also analyzed student reflections to contextualize the experiences they had whilst developing the communication competency during the gross anatomy course. **METHODS.** First-year medical students at the University of Louisville School of Medicine in Fall 2022 completed self- and peer-assessments using the Communication Assessment Tool (CAT) at the beginning and end of their gross anatomy course (n=83). The students also completed three competency development portfolio (CDP) entries throughout the course (n=83). Qualitative thematic analysis with grounded theory was used to analyze comments related to communication in the CDP reflections during the course. **SUMMARY.** There was a significant increase in CAT-peer-assessment scores from Time 1 (M = 4.70, SD = .331) to Time 2 (M = 4.87, SD = .264), with $p < .001$. The mean difference in CAT-peer-assessment scores was -.167. There was also a significant increase in CAT-self-assessment scores from Time 1 (M = 4.50, SD = .472) to Time 2 (M = 4.77, SD = .386) with $p < .001$. The mean difference in CAT-self-assessment scores was -.267. Thematic analysis of CDPs revealed that peer teaching, receiving feedback, relationships with team members, and improving confidence were main factors that contributed to growth in communication skills throughout the gross anatomy course. **CONCLUSIONS.** First-year medical students reflected upon and demonstrated self- and peer-perceived growth in the Communication competency in the gross anatomy lab context. These findings support the use of competencies in the gross anatomy lab context.

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*PUEBLA, Brittany¹, Nicole STARKE¹, Roham HADIDCHI², Andrew SCHLEFFER¹, Kaitlyn MORELL¹, and Mohammadali M. SHOJA¹. ¹Dr. Kiran C. Patel College of Allopathic Medicine, Nova Southeastern University, Fort Lauderdale, FL, 33328, USA; ²Department of Psychology and Neuroscience, College of Psychology, Nova Southeastern University, Fort Lauderdale, FL, 33328, USA.

Mapping the Branches of the Superior Cervical Sympathetic Ganglion: A Microdissection Study.

INTRODUCTION. The superior cervical sympathetic ganglion (SCSG), situated in the parapharyngeal space of the deep upper neck, plays a crucial role in the autonomic innervation of the head and neck. Sympathetic fibers within this region are known to innervate target tissues via cranial or spinal nerves as well as blood vessels. Despite its significance, the precise pattern of branching of the SCSG and its communication with other nerves remain poorly understood due to a lack of comprehensive information in the literature. This study aims to provide a detailed microanatomical examination of the branches of the SCSG. **METHODS.** Materials for this study were obtained from seven bisected cadaveric heads. Gross and stereomicroscopic dissections were performed to expose the parapharyngeal space. Gross dissection involved the removal of the ramus of the mandible, muscles of mastication, fascia, and connective tissue. Subsequently, stereomicroscopic dissection was performed to visualize the SCSG and trace its branches and interconnections. **SUMMARY.** The study revealed varied patterns of branching of the SCSG across the seven specimens, with branches ranging from two to eleven. Anastomosis with the superior laryngeal nerve, communications with cervical nerves C1, C2, and/or the loop of C1/C2, innervation of the carotid sinus, and connections with cranial nerve X were among the observed findings. Additionally, a distinct branch to the internal jugular vein was observed in several specimens. **CONCLUSIONS.** We present findings from a microdissection study aimed at comprehensively mapping the branches of the SCSG. Our findings underscore the intricate and diverse nature of SCSG anatomy. The branches of SCSG are variable among individuals. Within this variability, certain patterns are appreciated. By characterizing these patterns, this study seeks to enhance our understanding of the anatomy of the SCSG and its potential implications for clinical and surgical interventions.

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Perspectives of Students and Instructors on Peer Lab-Lead Initiative for M2 Anatomy Labs.

INTRODUCTION. A report on students' and instructors' perspectives of a Peer Lab-Leads initiative for M2 anatomy labs. Based on the anxiety and stress related to the M2 clinical anatomy bell ringer; the instructors developed an initiative to have Lab Leads in each group for every lab. **RESOURCES.** Prosections, models and bones, iPads, online and hardcopy resources (dissection instructions, atlases, and textbooks), and Anatomage table. **DESCRIPTION.** Before lab, Lab-Leads met with instructors to review the material in detail, using prosections, digital media, and models/bones. During lab, the Lab-Leads guided their respective group through the dissection of the day. Each student in each group had at least two opportunities to lead their group. **SIGNIFICANCE.** The goal of this initiative was to create confidence in anatomy and facilitate the retention of information. This initiative also fostered select competencies described in the Canadian Medical Education Directives for Specialists (CanMEDS) framework such as professionalism, communication, collaboration, leadership, and medical expert. Even though this initiative demanded more effort and time commitment from both students and instructors, the impact was overwhelmingly positive. Students' perspectives: "I really enjoyed the lab lead being implemented this year. I found myself much more prepared for lab and was able to learn more from my peers". "It was a much-needed stress that helped keep me motivated and prepared for the lab". Instructor's perspective: The quality of learning in terms of dissection and retention of information was remarkable. This was also reflected in their bellringer grades. Overall, the whole class was more enthusiastic, and engaged during lab. Furthermore, the students were more confident and better prepared for their bell ringer exam as compared to their M1 bell ringer exam. Subsequently, this initiative was extended to the M1 students and will continue to be incorporated in future labs.

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*SCHAFER, Andrew N.¹, Trevor JACKSON², Autumn POUGH², Genesis MENDEZ², Gary B. SCHWARTZ², and Mohammadali M. SHOJA². ¹Dr. Kiran C. Patel College of Osteopathic Medicine, Nova Southeastern University, Ft. Lauderdale, FL, 33328, USA; ²Dr. Kiran C. Patel College of Allopathic Medicine, Nova Southeastern University, Ft. Lauderdale, FL, 33328, USA. Variability in the Formation of Brachial Plexus in Man.

INTRODUCTION. Achieving successful surgical outcomes in brachial plexus injuries hinges upon a thorough understanding of the intricate anatomy of the brachial plexus. This study aims to reexamine the brachial plexus anatomy, with a specific focus on exploring variations in the formation of trunks and cords. METHODS. Thirty brachial plexuses were dissected to expose the trunks, divisions, cords, and branches of the brachial plexus. Fascicular dissection was used in variant plexuses to trace nerve fibers contributing to cords and terminal branches. SUMMARY. Three brachial plexuses exhibited significant deviations in formation. Variants included: 1) non-union of C8 and T1 ventral spinal roots resulting in four trunks, with the anterior division of C8 uniting with those of the upper and middle trunks. The single cord formed received a branch from T1 distally and trifurcated into the musculocutaneous, median, and ulnar nerves. The posterior cord received no contribution from T1; 2) union of C7, C8, and T1 leading to a plexus with two trunks, with the lower trunk dividing into two anterior divisions and a posterior division. The lateral and posterior cords were formed by the fusion of two anterior divisions, one from each trunk, and two posterior divisions, one from each trunk, respectively; and 3) anterior division of the middle trunk uniting with that of the lower trunk in front of the axillary artery, forming a trunk that divided into the medial root of the median nerve and ulnar nerve, while the lateral cord formed by the anterior division of the upper trunk alone. CONCLUSIONS. Significant deviations were observed from the typical formation of the brachial plexus in 10% of plexuses, underscoring the importance of comprehending the spectrum of major brachial plexus variations. While these variations will not impact function directly, they are critical for accurate diagnosis and treatment planning. The identification of major variations in brachial plexus anatomy is instrumental in refining surgical approaches, particularly in patients presenting with atypical anatomical configurations, ultimately fostering enhanced surgical outcomes.

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In the Future Everyone will be Famous for 15 Minutes: Time for Dr. Otto Lanz, Anatomist and Surgeon.

INTRODUCTION. Andy Warhol's famous quote is an opportunity to introduce Dr. Otto Lanz, a multifaceted Swiss-Dutch surgeon (1865-1936) in Europe. Fifteen minutes is worth knowing about his life and accomplishments, an example of a well-rounded physician. RESOURCES. The life story of Otto Lanz is reconstructed from diverse sources being medical, city and newspaper archives, and literary and artistic journals written in German, Dutch and English. DESCRIPTION. As a past assistant of Kocher, Lanz was well versed in thyroid surgery. His early years as a surgeon were during a time that 'typhlitis and perityphlitis' were recognized as 'appendicitis' caused by perforation of the inflamed vermiform appendix (1886) and the establishment of McBurney's point (1889). Among Lanz's medical contributions are Lanz's sign, point, and incision related to diagnosis and treatment for appendicitis. During surgery, he advocated for a meticulous asepsis approach, considered his finger to be 'the eye of the surgeon,' and was known for small esthetically placed incisions. Lanz implemented a surgical technique of using mesenteric flaps and performed prostate operations when many were still linking an enlarged prostate with hypersexual behavior. In 1907 he published his invention, the 'Hautschlitz apparat' (skin graft mesher), which increased the donor-recipient ratio for skin transplants. In his medical journal articles, Lanz reflected on failures he encountered during his practice. His upbringing and social connections paved the way for his renowned collection of early Italian renaissance art and led to poetic collections like *Erstlinge*, *Amor's Rache*, and *Xenien*. Many anecdotes highlight his charismatic character. Otto Lanz exemplified the essence of a humanistic physician long before the birth of the field of medical humanities. SIGNIFICANCE. A revered surgeon who met Lister, worked with Kocher, competed with McBurney, invented a skin graft mesher, published poetry, collected early Italian renaissance artwork.

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Factors Influencing Student Satisfaction and Memory from Learning Anatomy via VR and Human Cadavers.

INTRODUCTION. While human cadavers permit a hands-on method for learning anatomy, virtual reality (VR) is becoming a prevalent method for immersive visuospatial learning. Scholars have studied learning outcomes from teaching anatomy via human cadavers and VR, but few have scrutinized variables that can impact those outcomes. The present study aims to identify factors that influence student satisfaction and memory from learning anatomy via VR and human cadavers. METHODS. An advanced anatomy learning experience involving VR and cadaver pedagogies was designed and administered to 46 undergraduate anatomy students (23 Peer Teachers, 16 Teaching Assistants, and 7 Dissectors). Students completed a post-experience learning assessment, and they repeated the learning assessment two weeks later (unannounced) to assess knowledge retention. Questions surveying student satisfaction for the learning methods were included in the assessments. SUMMARY. Using a 5-point Likert scale (5 = very satisfied), students reported 3.8 ± 0.9 satisfaction with VR, 4.5 ± 0.5 satisfaction with cadavers, and 4.7 ± 0.6 satisfaction with integration of VR and cadavers. Students who preferred VR for self-paced (independent) learning scored 9.0% less on the knowledge assessment than those who preferred cadavers ($p < 0.01$), while no performance difference was evident from students who preferred either method for instruction. Dissectors performed best (98.6%) on the initial knowledge assessment but retained the least amount of information (-30.0%; $p < 0.001$). Teaching Assistants retained the most information (-15.0% from 91.3%; $p < 0.001$). CONCLUSIONS. Pedagogy preference, learning independence, and prior experience are factors that can influence student satisfaction and memory from VR and human cadaver experiences. This analysis exhibits the significance of rigorous study design to identify and account for variables that can influence interpretation of outcomes from anatomy education research studies.

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Cervical Vagus Nerve Supplies Vasculature in Humans.

INTRODUCTION. Cervical vagus nerve stimulation is used to treat epilepsy and depression and is currently tested in stroke rehabilitation and heart failure, but it can also cause side effects including dyspnea, dysphagia, pain, and bradycardia. Understanding of branching patterns at the cervical vagus nerve in humans is necessary for design and surgical placement of neuromodulation devices that maximize efficacy and minimize side effects. Cervical vagal branches innervating vessels have not been described in detail. METHODS. Right and left cervical vagus nerves from 4 embalmed human cadavers (2 male, 2 female) were dissected. Branches supplying the following vessels were exposed: internal carotid artery (ICA), common carotid artery (CCA), internal jugular vein (IJV), brachiocephalic trunk, subclavian artery. SUMMARY. Of the 32 total vascular branches dissected, the right vagus provided 18 (56%) branches and the left vagus provided 14 branches (44%). 94% of branches from the right vagus supplied a single vessel: 7 to the CCA (38%), 2 to the ICA (11%), 5 to the brachiocephalic trunk (28%), and 3 to the subclavian artery (17%). Only one branch supplied both the ICA and carotid bifurcation. 71% of branches from the left vagus supplied a single vessel: 3 to the CCA (21%), 4 to the ICA (29%), and 3 to the IJV (21%). 29% of branches supplied more than one vessel: 1 to the CCA and aorta; 1 to the CCA and subclavian artery, 1 to the CCA and IJV, and 1 to the ICA and carotid bifurcation. Origin points of the branches were variable: medial (11); lateral (9); anterolateral (5); anterior (4); posteromedial (3). There were no major differences in the number of vascular branches or their points of origin between males and females. CONCLUSIONS. Distinct branches originating from the cervical vagus frequently supply vessels in the neck and thorax.

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Posterior Descending Artery Variation in Cadaveric Hearts and Medical Student Education.

INTRODUCTION. Medical students engage in cadaver dissections to understand human anatomy, but encounter anatomical variations not fully described in textbooks. For example, the heart's posterior descending artery (PDA) can have various branching patterns, contrary to many textbook depictions. This project aims to describe PDA variations as well as develop engaging learning opportunities for students to be informed of PDA variations and its clinical relevance.

METHODS. In this project, a total of 11 cadaveric hearts were selected and dissected to isolate the PDA. After clearing the pericardium and surrounding fat, the hearts were photographed for comparison, revealing variations in the PDA. A lab station was then set up during the cardiovascular anatomy lab session for first-year medical students at the University of Central Florida College of Medicine. Students identified and dissected their cadaver's heart, received confirmation of their heart's dominance, and then compared it with the dissected examples and examined PDA variation. A quiz involving the clinical significance of heart dominance and the PDA was administered to assess students' knowledge before and after the session, aiming to measure student understanding. Additionally, students were invited to take a survey about student confidence regarding PDA variation and heart dominance. **SUMMARY.** Photographs of the dissected heart PDA specimens were systematically arranged, and PDA vessel number and branching was examined. Multiple variations were identified. Additionally, student quizzes showed increases in content knowledge, and surveys showed increased confidence in vessel identification. **CONCLUSIONS.** While anatomy textbooks often simplify the PDA as a single vessel, cadaveric heart dissections reveal multiple branches. The cardiovascular lab station showed increases in student scores and in perceived confidence. Overall, this study supports medical student exposure to cardiovascular anatomical variability and its clinical relevance in the anatomy laboratory. Future research should involve more cadaver specimens and related imaging to further explore PDA variation.

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Terminological and Medical Teaching Confusions around Uterine / Endometrial Natural Killer Cells.

INTRODUCTION. In the last few years, there has been significant progress in understanding implantation and the immune processes connected to it. The most prominent cell population at the maternal-fetal interface is the population of uterine natural killer cells (uNK) cells. Around 20–30% of women with idiopathic recurrent miscarriages or recurrent implantation failure show, according to some studies, altered uNK cell counts. **RESOURCES.** In the present poster, we summarize three lesser-known historical and terminological facts about uNK cells. **DESCRIPTION.** In the present descriptive abstract, we will focus on three lesser-known areas of knowledge about uNK cells. First, from the point of view of histology, we will comprehensively map the history of the discovery of these cells. Secondly, we will discuss the interesting aspect of terminology, since uNK cells are probably one of the human cells with the highest number of synonymous names. From the first description of this cell type, they were referred to as endometrial granulocytes, granular endometrial stromal cells, or large granular lymphocytes until the beginning of the 1990s, when the first publications appeared where the name "uterine NK cells" was used. The third area of present review is medical teaching of histology and clinical embryology. We can confirm that uNK cells are, in most textbooks, overlooked and almost forgotten cells despite their enormous importance in clinical practice. **SIGNIFICANCE.** The exact pathophysiological mechanisms of how uNK cells may contribute to recurrent implantation failure or recurrent miscarriages are still obscure and elusive. uNK cell research needs to address several issues before it can be implemented clinically, e.g., the development of a precise methodology of uNK cell targeting within the state-of-the-art immune therapy of pregnancy-related conditions. **Acknowledgement:** This study was supported by the grant from The Slovak Ministry of Education No. VEGA 1/0625/23.

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Activity Profile of Gross Anatomy Lab Course Instruction.

INTRODUCTION. A vast compendium of various physical activities has been compiled that ranges from vigorous tasks in the occupational and recreational domains, to typical household tasks and life skills. These have been developed to allow users to understand their individual activity profile for intake and caloric expenditure. Teaching gross anatomical dissection courses is physically demanding, and anecdotally, has a different activity profile than teaching other courses. The purpose of this study was to quantify the basic activity profile of gross anatomical instruction and compare these measure to other occupation tasks. RESOURCES. For a period of 7-years, faculty and laboratory staff (n=82; 36.2years \pm 7) were provided commercially available activity monitors (Fitbit Charge, Fitbit, San Francisco, CA) and were worn during all gross anatomy lab dissections (270min/session \pm 28) in a semester-long class. Data were collected and reported after each class session including, steps, caloric expenditure and time of activity. DESCRIPTION. The average caloric expenditure/session was 572.1 kCal (SD = 41.3, or 127.11 kCal/hour) during the instruction of gross anatomy lab experiences and was found to be similar to general carpentry (145 kCal/hour) and custodial work (136 kCal/hour). However, the profession that was most similar was nursing. Recent studies have shown that ward nurses on 12-hour shifts exhibit caloric expenditure of 1512 kCal/shift, or 126.75 kCal/hour. When the objective tasks are compared, its not surprising that these professions exhibit several similarities. Both repeatedly perform work from station-to-station throughout the day requiring above average amounts of standing and walking. Further the work performed at a station also requires a mixture of finite precision and moving of the subject/patient. Although these data aren't unique or novel, it may be of particular interest to those that perform this occupation skill. SIGNIFICANCE. Guiding the dissection experiences for medical and allied health students is a vigorous and strenuous job that requires the background and familiarity human anatomical structures with physical demands that are more extensive than a typical class or laboratory setting.

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Unilateral Double Facial Artery: An Anatomic Variant and Clinical Implications.

INTRODUCTION. This case reports a rare anatomical variant of the facial artery -- namely, a double facial artery pattern -- which has significant implications in a wide range of surgical and aesthetic medicine disciplines. RESOURCES. A 61-year-old female cadaver with a unilateral facial artery variant branching pattern was discovered during a cadaveric dissection for an anatomy course. DESCRIPTION. The dissection revealed an unusual supply of the typical facial artery distribution by two separate branches from either side of the maxillary artery. The first branch, termed FA1, followed a typical FA course arising from the external carotid to supply the lower portion of the face via lingual, inferior labial, and mental arterial branches. The second branch, termed FA2, arose superior to the maxillary artery near the origin of a typical transverse facial artery, to supply the upper portion of the face via superior labial, lateral nasal, and angular arterial branches. No direct communication between the two branches was observed grossly via dissection. The observed branching pattern has not previously been reported in literature and has critical implications for surgical planning and intervention. SIGNIFICANCE. This study emphasizes the importance of understanding variant FA anatomy in procedures requiring precise anatomical knowledge of arterial supply to the face. Duplicate and/or secondary facial arteries necessitate careful consideration for their potential consequences on the success of surgery of the head and neck, dermal fillers, and embolization for epistaxis procedures.

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*ZALUNARDO, Jillian M., Joshua R. ALLRED, Laura G. BARTA, Luke A. THORNE, Natalie YOSHIOKA, and Christian HECK. Department of Anatomy, College of Medicine, Pacific Northwest University of Health Sciences, Yakima, WA, 98901, USA. Epigastric Hernia of the Falciform and Round Ligaments in a Cadaver with Trisomy 21: Case Report.

INTRODUCTION. Trisomy 21 is known to increase the risk for congenital abnormalities, with defects of the abdomen (diaphragmatic hernias, connections between the umbilicus and portal venous system) being common. Presented here, in a cadaver known to have Trisomy 21 during life, is a ventral wall defect unique in its involvement of only the falciform and round ligaments. RESOURCES. Cadaveric dissection was completed per educational curriculum for Anatomy 505 course. DESCRIPTION. Upon dissection of the cadaver, a 52-year-old individual with Trisomy 21, an epigastric herniation of the falciform ligament and hepatic round ligament was observed. It protruded through the abdominal wall 7.07 cm superior to the umbilicus, with the herniated material composed of a fatty, fibrous tissue. Notably, there was no associated intestinal involvement and the paraumbilical vessels were intact. Per the European Hernia Society's guidelines, this structure is considered a large epigastric hernia, having a diameter greater than 4.78 cm. SIGNIFICANCE. Falciform hernias are scarce (0.2% share of the total hernia burden) and are often iatrogenic in nature (surgery, particularly cholecystectomy). Additionally, most cases of falciform hernias result in small intestine incarceration and bowel obstruction, and thus produce an array of health problems. Due to lack of visible signs of surgical history and all major abdominal organs of the adult cadaver being intact, a possibly congenital cause is suspected. During development, Wnt/Beta-Catenin is a signaling factor known to assist in formation of the ventral body wall. Wnt has been associated with Trisomy 21 defects in other body regions, but not confirmed to influence risk of hernias. As few cases of falciform hernias have been reported, this case's findings make this defect a rare and previously uncharacterized manifestation of a known genetic and physiologic phenomenon. This finding conjures questions of a clinical nature; when does a physician need to screen for ventral wall defects in Trisomy 21 patients, and does there exist some threshold beyond which direct intervention becomes necessary? This case study characterizes the epigastric hernia observed in a cadaver with Trisomy 21, provides photographic documentation, and highlights possible clinical implications.

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*ZHANG, Chi, Braedon GUNN, and Andrew READ-FULLER. School of Dentistry, Texas A&M University, TX, 75246, USA. An Open-Source Program for Virtually Assessing Preformed Plate Fitness to Orbital Fracture Sites.

INTRODUCTION. Preformed titanium plates are commonly used to repair orbital fractures. Poorly adapted plates can impact eye functions and cosmetic appearance. There is a lack of knowledge and accessible software tools to determine the adaptability of preformed plates to orbital fracture sites across populations. Therefore, this study aims to develop an open-source program for surgeons to evaluate plate fitness based on virtually registering plates to orbital fracture sites. METHODS. The software module and workflow development are based on Python scripting utilizing functions within 3D Slicer, an open-source biomedical imaging and modeling software. The 3D model of an orbit for testing the software is segmented from the CT images using 3D Slicer. The initial virtual plate registration is based on aligning surgical landmarks placed on the plate and the orbit. As the plate should sit just above the unfractured orbital bone, the module can detect and highlight intersection regions between the 3D models of the plate and the orbit. Surgeons can then use the provided interaction tools to conveniently adjust the plate's position for an optimized result with no intersection. SUMMARY. We provide a graphic user-interface module that can be freely installed in 3D Slicer for performing virtual plate registration. Based on the registration results, surgeons can perform visual and quantitative evaluation (e.g., using measurements) to assess plate fitness for individual patients). CONCLUSIONS. We plan to use this software to investigate the fitness of plates from different manufactures across a large sample of patients. This can lead to potential plate design improvements. Overall, our development and research can provide accessible software and standardized workflows for virtual orbital surgical planning, decrease the operative time and cost, and improve surgical outcomes. This project also sets up the foundation for the future development of a virtual surgical planning program that can support all types of oral and maxillofacial surgeries.

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