Western Medical Research Conference
January 19-21, 2023
Camel, California

Award Winners from COMP

WSPR Abbott Nutrition Lowell Glasgow Student Research Award

Ellese Lupori, DO 2025
Western University of Health Sciences
College of Osteopathic Medicine of the Pacific – Northwest Campus

WAFMR/WAP Student Subspecialty Award

Nathaniel DeMarco, DO 2025
Western University of Health Sciences
College of Osteopathic Medicine of the Pacific

COMP and COMP-NW were represented this year by the following 42 abstracts:

#132 - Oral presentation

MEMORY-RELATED REGULATION OF EXTRACELLULAR MATRIX IN THE HIPPOCAMPUS OF ANGELMAN SYNDROME MICE

Lam AJ, Su W, Liu Y, Reece T, Hao X, Baudry M, Bi X. COMP

#511 – Oral presentation

TRANSCRIPTIONAL PROFILING OF GERMLINE-ENCODED, MYCOLYL-REACTIVE CELLS IN PREVIOUSLY MYCOBACTERIUM TUBERCULOSIS-EXPOSED PERUVIANS

Hsieh A, Lopez K, Iwany SK, Reijneveld JF, Ocampo TA, Jimenez J, Calderon R, Lecca L, Murray MB, Moody DB, Van Rhijn I, Suliman S. COMP

#102 – Oral presentation

IMPACT OF A SEMI-AUTONOMOUS TREATMENT ALGORITHM ON FETAL HEART RATE TRACING FOR THE MANAGEMENT OF SEVERE HYPERTENSION IN PREGNANCY

Sanchez A, Martin C. COMP

#502 – Oral presentation

THE ROLE OF LIPOCALIN-2 IN TRIPLE NEGATIVE BREAST CANCER SPHEROID/ORGANOID PROGRESSION AND INVASION.

Gerami A, Gamez J, Cox J, Sanchez F, Kelber J. COMP

#10 – Oral presentation

EXTRACELLULAR RIBOSOMAL PROTEINS IN MYOCARDIAL HEALING

Thai AV, Doescher CI, Agrawal DK, Thankam FG. COMP

310 – Oral presentation

EXON 6 DELETION IN LIPASE MATURATION FACTOR-1 AS A CAUSE OF FAMILIAL CYHLOMICRONEMIA SYNDROME

Bjarvin A, Peterfy M. COMP

329 – Oral presentation

MITOCHONDRIAL BIOGENESIS REGULATES NEOINTIMAL FORMATION AND VESSEL REMODELING DURING ARTERIOVENOUS FISTULA MATURATION

Abdi A, Rai V, Agrawal DK. COMP

328 – Oral presentation

ROTATOR CUFF HEALTH AND EMERGING THERAPIES FOR TREATMENT: A LITERATURE REVIEW

Yazdani A, Rai V, Agrawal DK. COMP

369 – Oral presentation

COMPARITIVE GENE EXPRESSION OF SUSCEPTIBLE AND RESISTANT VECTORS OF THE HUMAN PATHOGEN, SCHISTOSOMA MANSONI

Calcote A, Fuller J, Xiong Y, Pennance T, Owino G, Odiere M, Steinauer M. COMP-NW

500 – Oral presentation

TIKTOK, IT'S THAT TIME OF MONTH: A QUALITATIVE EVALUATION OF TIKTOK AS A SOURCE OF INFORMATION ON MENSTRUATION

Nguyen N, Haddadin CM, Nelson AL. COMP

#81 – Oral presentation

ISCHEMIA CONTROLLED GENES IN ACCELERATED CARDIAL HEALING FOLLOWING MYOCARDIAL INFARCTION

Cha E, Hong SH2, Fung C, Teramoto D, Rai T, Liu J, Agrawal DK, Thankam FG. COMP

415 – Oral presentation

THE IMPACT OF COVID-19 PANDEMIC ON AFFECTIVE CONCUSSION SYMPTOMS IN ADOLESCENTS

Lupori E, Ugalde V, Dong F. COMP-NW

533 – Oral Presentation

ASSESSING MEDICAL AND PHYSICAL THERAPY STUDENTS' COMPETENCIES IN CONCUSSION MANAGEMENT PROTOCOL

Lupori E, Iqbal F, Wang D, Tangog EA, Cheung W, McKay L, Alsky T, Baron D. COMP-NW

33 – Oral presentation

SEROLOGICAL ASSESSMENT OF THE EFFECTIVENESS OF OSTEOPATHIC MANIPULATIVE TO AUGMENT THE COVID-19 VACCINE IMMUNE RESPONSE

Martinez E, Loveless B, Crone P, Szurmant H, Fuchs S, Sanchez J. COMP

534 – Oral presentation

IMPACT OF CLINICAL ROTATIONS/SHADOWING ON CONCUSSION KNOWLEDGE AMONG MD/PT STUDENTS IN THE US

Iqbal F, Lupori E, Wang D, Cheung W, Tangog EA, McKay L, Alsky T, Baron D. COMP

97 Oral presentation

HOME BIRTH IS TRENDING: ATTITUDES AND PRECEPTIONS OF HOME AND HOSPITAL BIRTH ON TIKTOK

Lane F, Morris K, Stohl H, Nelson AL. COMP

428 – Oral presentation

THE IMPACT OF HOMELESSNESS ON MANAGEMENT OF MENSTRUATION AND DYSMENORRHEA IN POMONA, CA

Ahuja GK, Holtzman S, Fuchs S, Nelson AL. COMP

23 – Oral presentation

ETIOLOGY AND INCIDENCE OF DRY EYE DISEASE IN GUATEMALA

Ung GA, Nguyen C, You TT, Dong F, Fuchs S. COMP

31 – Oral presentation

NUTRITIONAL RECOMMENDATIONS FOR FERTILITY AS PROMOTED ON SOCIAL MEDIA

Sims N, Egnew H, Carroll TL, Modesette A, Blair L, Nelson AL. COMP-NW

340 – Oral presentation

CONTRACEPTIVE BELIEFS, NEEDS, AND PRACTICES OF SIKH WOMEN IN SOUTHERN CALIFORNIA

Sidhu HK, Nelson AL. COMP

366 – Oral presentation

3-AMINOIMIDAZO[1,2-A] PYRIDINE DERIVATIVES AS NOVEL ANTIMICROBIAL COMPOUNDS

Glassman I, Alcantara C, Bentley E, Vosburg D, Szurmant H. COMP

397 – Oral presentation

RISK OF RETINAL VASCULAR OCCLUSION AMONG PATIENTS WITH COVID-19 AND INFLUENZA A: A MULTI-CENTERED ANALYSIS

Inouye K, Pakhchanian H, Raiker R, Pham D, Hong A, Dang S, Dalal M, Asahi M. COMP

501 – Oral Presentation

HOME VS. HOSPITAL BIRTH: PATIENT PERCEPTIONS, ATTITUDES, AND ADVICE EXPRESSED ON REDDIT

Morris K, Lane F, Nelson A, Stohl H. COMP

112 – Oral presentation

AN INTERNATIONAL COMPARISON OF PHOSPHODIESTERASE-5 INHIBITOR ASSOCIATED MELANOMA

Mai K, Pham Q, Park J, Kuo Y. COMP

52 – Oral presentation

NEONATAL HYPOGLYCEMIA INDUCED AFTER INITIATION OF LATE PRETERM ANTENATAL CORTICOSTEROIDS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Nguyen K, Katheria A. COMP

#84 – Oral presentation

POINT OF CARE ULTRASOUND IN DIAGNOSING REGIONAL WALL MOTION ABNORMALITIES IN PATIENTS WITH ST SEGMENT ELEVATED MYOCARDIAL INFARCTION

Desai M, Saadat S, Baker J, Kurzweil A, Rowland J, Abrams E, Whited M, Fox J. COMP

391 – Oral presentation

ONCOSTATIN-M-PLASMINOGEN ACTIVATOR INHIBITOR-1 PROPOSED EFFECTS ON ARTERIOVENOUS FISTULA MATURATION: A LITERATURE REVIEW

DeMarco N, Rai V, Agrawal DK. COMP

273 – Oral presentation

CARDIAC REGENERATIVE POTENTIAL OF EPICARDIAL ADIPOSE TISSUE-DERIVED STEM CELLS

Cheng P, Keklikian A, Agrawal DK, Thankam FG. COMP

44 – Oral presentation

EXPLORING THE ROLE OF NA+/K+ ATPASE MEDIATED INFLAMMASOME ACTIVATION AS A POSSIBLE INTERVENTION AGAINST TUBERCULOSIS

Kishore P, Reijneveld JF, Suliman S. COMP

147 Oral presentation

VEGF AND ANGIOPOIETIN AS REGULATORS FOR ANGIOGENESIS IN PERIPHERAL ARTERY DISEASE

Lo G, Phan R, Radwan MM. COMP

399 – Oral presentation

CHANGES IN nREM SLEEP DURATION FOLLOWING THALAMIC LOW INTENSITY FOCUSED ULTRASOUND PULSATION: PRELIMINARY DATA

Chawla R, Gumarang J, Rosario E, Patterson D, Chang E, Jenson G, Mantik C, Dhadwal N, Monti M, Schnakers C. COMP

429 – Oral presentation

THE IMPACT OF STRUCTURAL HEALTH INEQUITIES ON THE AAP'S 2022 POLICY: BREASTFEEDING AND THE USE OF HUMAN MILK

Saleem S, Burger K. COMP

432 – Oral presentation

COMPARISON OF OCCUPATIONAL THERAPY AND OSTEOPATHIC MANIPULATIVE TREATMENT INNEONATAL INTENSIVE CARE UNITS

Saleem S, Burger K, Takata B, Zufall B, Oosterbaan C. COMP

39 – Oral presentation

DISCREPANCIES IN MELOXICAM COX INHIBITION BETWEEN BALL PYTHONS AND HUMANS

Gilbert NR, Zhong V, Issar M, Fuchs S, Eng C.

#211 – Poster

COVID-19 BOOSTER VACCINE RELATED DERMATITIS: A CASE STUDY

Sheikh A, Godil S, Pham D. COMP

#242 – Poster

DUPLICATED INFERIOR VENA CAVA - A CASE STUDY

Anwar H, Pardi A, Patel M, Raquib A, Andrews K, Broniak C, Sperling E. COMP-NW

#162 - Poster

TOWARDS NEW ANTIMICROBIALS - TARGETING BACTERIAL RESPONSE REGULATORS

Alcantara C, Glassman I, Majdi C, Dessolin J, Benfodda Z, Szurmant H. COMP

#182 - Poster

DIAGNOSTIC CHALLENGES IN THE DETECTION OF ATYPICAL STAPHYLOCOCCAL SEPTIC ARTHRITIS

Glassman I, Nguyen K, Cappadona A. COMP

#197 - Poster

PRIMARY CUTANEOUS DIFFUSE LARGE B-CELL LYMPHOMA, LEG TYPE PRESENTING AS HYPERCALCEMIA AND CELLULITIS – A CASE REPORT

Nguyen JH, Bauer C, Tran T. COMP

#231 - Poster

OUT OF AFRICA HUMAN MIGRATION AND SKIN PIGMENTATION ADAPTATION: A REVIEW ON THE EVOLUTIONARY VITAMIN D ADAPTATION HYPOTHESIS

Diehl KL, Krippaehne EM, Minasyan M, Banh M, Hajjar K, Ng J, Wais N, Goulding A, Yu IO, Tran MD, Sheikh A, Lai C, Panchal N, Kesler A, Wisco OJ. COMP

#232 - Poster

HOW FAMILY STRUCTURE AND CHILDHOOD HEALTH CARE ACCESS INFLUENCE CAREER CHOICES IN THE MEDICAL FIELD: A SURVEY OF OSTEOPATHIC MEDICAL STUDENTS

Herbert N, Nelson AL. COMP

537 - Published

TRAINING ADEQUACY AND CONFIDENCE LEVEL FOR CARING FOR POPULATION WITH DISABILITY AMONG AMERICAN MEDICAL STUDENTS

Eaton L, Mooney T, Lucara KM, Andrews K, Spaan J, Fuchs S. COMP-NW

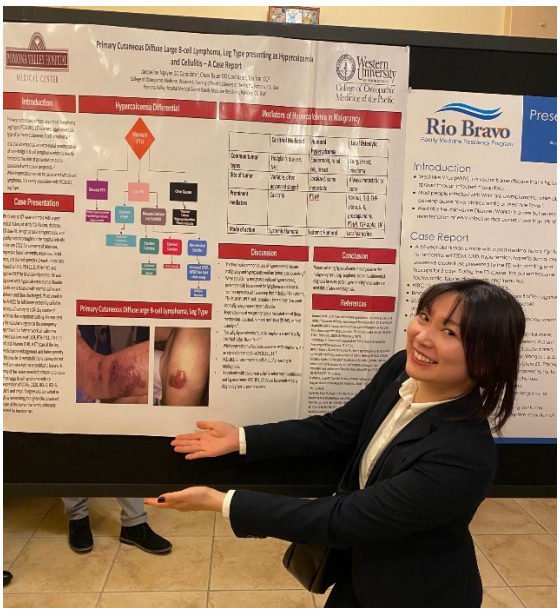
The following 82 students are coauthors on those abstracts:

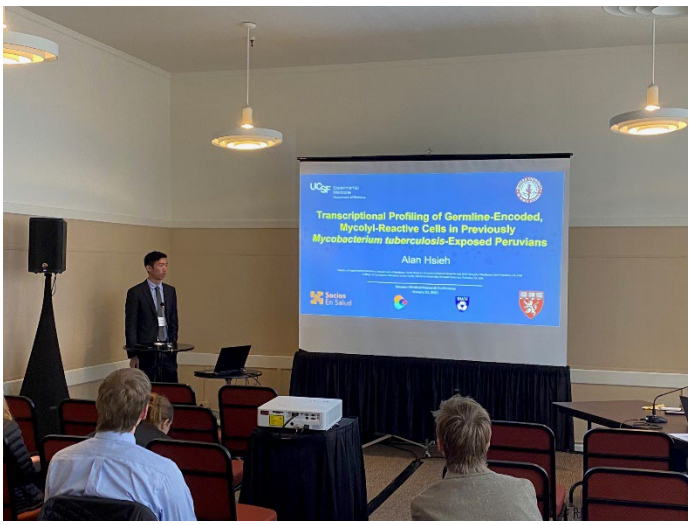
	First name	Last name	campus	Class
1	Aaishah	Raquib	Lebanon	2025
2	Allison	Modesette	Lebanon	2025
3	Andrew	Pardi	Lebanon	2025
4	Anna	Bjarvin	Lebanon	2025
5	Ashleigh	Calcote	Lebanon	2025
6	Christine	Broniak	Lebanon	2025
7	Elise	Krippaehne	Lebanon	2025
8	Ellese	Lupori	Lebanon	2025
9	Erica	Fuller	Lebanon	2025
10	Fiona	Lane	Lebanon	2025
11	Hamsat	Anwar	Lebanon	2025
12	Justin	Ng	Lebanon	2025
13	Katherine	Andrews	Lebanon	2025
14	Lauren	Garrison	Lebanon	2025
15	Mira	Patel	Lebanon	2025
16	Tanner	Mooney	Lebanon	2025
17	Halley	Egnew	Lebanon	2024
18	Kendall	Lucara	Lebanon	2024
19	Nicole	Sims	Lebanon	2024
20	Taryn	Carroll	Lebanon	2024
21	Lillie	Blair	Lebanon	2023
22	Fatima	Iqbal	Pomona	2026
23	Aileen	Lam	Pomona	2025
24	Alan	Hsieh	Pomona	2025
25	Amir	Gerami	Pomona	2025
26	An	Thai	Pomona	2025
27	Arian	Abdi	Pomona	2025
28	Armand	Yazdani	Pomona	2025
29	Cameron	Fung	Pomona	2025
30	Cathleen	Nguyen	Pomona	2025
31	Cheldon	Alcantara	Pomona	2025
32	Christian	Doescher	Pomona	2025
33	Collette	Haddadin	Pomona	2025
34	Darren	Teramoto	Pomona	2025
35	Ed	Cha	Pomona	2025
36	Geoffrey	Lo	Pomona	2025
37	Grace	Ahuja	Pomona	2025
38	Gwendolyn	Ung	Pomona	2025
39	Harneet	Sidhu	Pomona	2025
40	Ira	Glassman	Pomona	2025
41	Ivin	Yu	Pomona	2025

	First name	Last name	campus	Class
42	Jane	Park	Pomona	2025
43	Karim	Hajjar	Pomona	2025
44	Kelsey	Morris	Pomona	2025
45	Khoa "Tom"	Nguyen	Pomona	2025
46	Marian	Banh	Pomona	2025
47	Marine	Minasyan	Pomona	2025
48	Marissa	Tran	Pomona	2025
49	Monica	Desai	Pomona	2025
50	Nancy	Nguyen	Pomona	2025
51	Nathaniel	DeMarco	Pomona	2025
52	Nejma	Wais	Pomona	2025
53	Niyati	Panchal	Pomona	2025
54	Pauline	Cheng	Pomona	2025
55	Priya	Kishore	Pomona	2025
56	Quang	Pham	Pomona	2025
57	Ricky	Phan	Pomona	2025
58	Rohan	Chawla	Pomona	2025
59	Stone	Holtzman	Pomona	2025
60	Suha	Godil	Pomona	2025
61	Sung Ho	Hong	Pomona	2025
62	Vivian	Zhong	Pomona	2025
63	Akber	Sheikh	Pomona	2024
64	Alice	Kesler	Pomona	2024
65	Alyssa	Sanchez	Pomona	2024
66	Anabel	Goulding	Pomona	2024
67	Cassandra	Lai	Pomona	2024
68	Claire	Oosterbaan	Pomona	2024
69	Keiko	Inouye	Pomona	2024
70	Kevin	Nguyen	Pomona	2024
71	Kyra	Diehl	Pomona	2024
72	Nicolette	Herbert	Pomona	2024
73	Derek	Wang	Pomona	2024
74	Ekaterina	Tangog	Pomona	2024
75	Willy	Cheung	Pomona	2024
76	Blake	Zufall	Pomona	2023
77	Chase	Bauer	Pomona	2023
78	Jacqueline	Nguyen	Pomona	2023
79	Kevin	Mai	Pomona	2023
80	Kristina	Burger	Pomona	2023
81	Saba	Saleem	Pomona	2023
82	Eric	Martinez	Pomona	

Western Medical Research Conference
January 19-21, 2023

Abstract presented
by
COMP and COMP-NW students.





 # 10

Extracellular ribosomal proteins in myocardial healing

Thai AV[1], Doescher CI[1], Agrawal DK[2], Thankam FG[2]. [1]College of Osteopathic Medicine of the Pacific, Western University of Health Sciences, Pomona, CA and [2]Western University of Health Sciences, Pomona, CA

Purpose of Study: Cardiovascular diseases represent the leading causes of global death, which is often due to myocardial infarctions (MI). The limited regenerative potential of the myocardium following MI results in cardiac remodeling, which impairs its contractile function. Our previous studies identified extracellular exosomal proteins from epicardial adipose tissue derived stem cells (EATDS) under ischemic challenge. We postulate that these EATDS-derived exosomal ribosomal proteins influence phenotypic changes and influence cardiac remodeling via cardiac fibroblasts (CF). Hence, we examined the expression status of the ribosomal proteins in post-MI myocardium of Yucatan miniswine and isolated CF.

Methods Used: Mass spectrometry analysis revealed increased secretion of the ribosomal proteins including RPL10A, 40RPS18, 40SRPS30, 60RPL14, and 40RPSA in the secretory vesicles of EATDS. The level of these ribosomal proteins was examined in the infarct zone tissue harvested from the MI-swine model using immunostaining. Similarly, the expression status of these proteins were tested in the isolated cardiac fibroblast challenged with ischemia (118 mM NaCl, 24 mM Na_2HCO_3, 1 mM Na_2HPO_4, 2.5mM $CaCl_2$, 1.2mM, $MgCl_2$, 20 mM sodium lactate, 16mM KCl, 10mM 2-deoxyglucose and pH 6.2) using qRT-PCR, Western Blot, and immunofluorescence.

Summary of Results: Histologic analysis of the myocardial tissue from the post-MI swine revealed significant inflammation, extracellular matrix (ECM) disorganization, and increased fibrosis suggesting the similar clinical pathology of MI. The levels of RPL10A, 40RPS18, 40SRPS30, 60RPL14, and 40RPSA were significantly altered in the ischemic fibroblasts and infarct zone tissues at the mRNA and protein levels.

Conclusions: The results suggest a significant role of the extracellular ribosomal proteins in structural and functional changes within the myocardium, highlighting their possible therapeutic applications in translational cardiology.

Healthcare Delivery Research I
Concurrent Session

12:45 PM
Thursday, January 19, 2023

 # 23

ETIOLOGY AND INCIDENCE OF DRY EYE DISEASE IN GUATEMALA

Ung GA[1], Nguyen C[1], You TT[2, 3], Dong F[4, 5], Fuchs S[1]. [1]Western University of Health Sciences, Pomona, CA; [2]Western University of Health Sciences, Pomona, CA; [3]Orange County Retina, Santa Ana, CA; [4]Western University of Health Sciences, Pomona, CA and [5]Western University of Health Sciences, Pomona, CA

Purpose of Study: GU and CN contributed equally to this project. Dry Eye Disease (DED) is defined as a multifactorial disease of the ocular surface characterized by a loss of homeostasis of the tear film. It is one of the most frequent causes of eye related complaints. DED is common in Guatemalan communities but few studies aim to identify risk factors. Housing conditions without smoke evacuation are of concern. The aim of this retrospective study is to determine the prevalence of DED and its association with housing risk factors among the adult population of Guatemala. We hypothesize that adequate smoke ventilation will yield lower burdens of DED.
Methods Used: Gift of Vision Foundation provides free ophthalmologic care to the low income rural Guatemalan population. Patients are screened for DED with a 27-question survey including demographic, housing and medical conditions. These include 11 objective symptoms often used in the diagnosis for DED. A subset of patients undergo a Schirmer's Test to objectively quantify tear production. For this study, patient charts collected in September 2022 were de-identified and analyzed using descriptive statistics with SAS software. Cohen's Kappa was used to measure the agreement on eye dryness and self-reported data. Chi-square tests were conducted to assess the association between various variables and dryness.
Summary of Results: A total of 315 patients were included and 68.6% are female. The average age was 43.3 (standard deviation 17). 72.2% cooked indoors, 78.7% had a smoke evacuation method, and 47.0% used smoke-free energy as the source of cooking. 8.8% were cooking indoors with smoke producing energy without proper evacuation and constituted our exposed group. 35.9% had dry eyes based on Schimers' test. There was little agreement between the objective test and subjective symptoms (Kappa=0.0754). Moreover, for participants who had an outdoor kitchen, those who used smoke-free energy had lower likelihood of having dry eyes based on Schimers' test as compared to those who used smoke producing energy (40% vs 63.6%), though the difference was not statistically significant (p=0.3705). For participants who had an indoor kitchen, participants had more likelihood of dry eyes when using smoke-free energy if no evacuation was present (75% vs 52.5%, p=0.4456). However, for participants who had an indoor kitchen when using smoke producing energy, there was no statistically significant difference of dry eye based on Schirmer's test regardless whether evacuation was present or not (48.2% vs 46.2%, p=0.9058).
Conclusions: Subjective data to survey DED provides less utility compared to objective measurements, such as Schirmer's Tests. Outdoor kitchens with smoke-free energy are less likely to contribute to DED as do indoor kitchens with smoke free energy and an evacuation method. However, the implementation of smoke evacuation methods would most likely not result in or have minimum health benefits on DED.

 # 31

NUTRITIONAL RECOMMENDATIONS FOR FERTILITY AS PROMOTED ON SOCIAL MEDIA

Sims N, Egnew H, Carroll TL, Modesette A, Blair L, Nelson AL. Western University of Health Sciences COMPNW, Lebanon, OR

Purpose of Study: This study explored dietary advice to increase fertility on social media platforms, compared to professional organization websites (e.g. ACOG). We hypothesized that social media users would address gaps in professional content on nutritional recommendations for promoting fertility.
Methods Used: Posts created during the 2021 calendar year were identified in April 2022 from Facebook and Youtube using nine different keyword tags (e.g. “fertility nutrition”, “fertility diet”, “foods to get pregnant”). Each post meeting inclusion criteria (≥100 views on Facebook video, ≥30 likes and ≥5 shares on Facebook, or ≥1000 views on Youtube, publicized in English) was read or watched and summarized into themes. Themes were cross checked to assess fit and accuracy, with many posts being multi-coded.
Summary of Results: A qualitative analysis of posts revealed seven themes: nutritional mechanisms for promoting female fertility; male fertility; hormone balance; antioxidant/anti-inflammatory supplements; general health recommendations; foods to avoid; advertisement. Of 136 posts, two referenced citations and two others included links to professional organizations. Recommended micro and macronutrients generally followed professional guidelines for health during pregnancy. Yet, content creators frequently promoted specific diet regimens or food types, with vague explanations on how that diet would aid fertility. These diets often included expensive and/or uncommon ingredients (e.g. beef heart, guava leaves, stinging nettle, raw pumpkin seed), presented as the best source of a specific micronutrient. Some posts promoted expensive supplements, whereas professional websites suggested generic multivitamins to address the same nutritional deficiencies. Professional recommendations referenced physiologically necessary amounts of nutrients, while social media posts frequently lacked evidence based support, promoting a food item without guidelines for consumption. Many posts contained advertisements or affiliate links.
Conclusions: Fertility nutrition advice given on social media followed rough outlines of pregnancy advice published by professional organizations, but with emphasis on specific nutrients and preparations. The stress and expense of procuring specific ingredients may negatively affect patients. Pseudoscientific explanations perpetuate misinformation. Due to the lack of guidance on fertility nutrition from verified sources, patients may fall victim to self-promotional advertisements for expensive personal coaching or unverified fertility supplements. We recommend professional organizations create content to address these gaps and protect patients at a vulnerable time in their reproductive journey.

 # 33

SEROLOGICAL ASSESSMENT OF THE EFFECTIVENESS OF OSTEOPATHIC MANIPULATIVE TO AUGMENT THE COVID-19 VACCINE IMMUNE RESPONSE

Martinez E, Loveless B, Crone P, Szurmant H, Fuchs S, Sanchez J. Western University of Health Sciences, Pomona, CA

Purpose of Study: Previous Osteopathic manipulative treatment (OMT) research has shown evidence of increased lymphatic movement resulting in increased leukocyte and cytokine flow. One study even showed increased antibody titer response in patients when used in conjunction with the Hepatitis B vaccine. Given previous studies, our group conducted a year-long longitudinal randomized controlled clinical trial to evaluate the ability of OMT to improve the COVID-19 vaccine immune response.
Methods Used: Subjects were randomized into either the control arm or OMT intervention arm. OMT consisted of myofascial release of the thoracic inlet, pectoral traction, diaphragm release with MFR, splenic pump, and thoracic pump applied the day of and the day following each vaccination session. All subjects in each group received the Pfizer mRNA COVID-19 vaccine. All subjects had blood drawn on day 0 (1st vaccine), day 7, day 21 (2nd vaccine), days 28, 90, 210, and 365. Anti-spike IgG immunoglobulin titers (AS IgG) were measured at all time points for all subjects. Side effects, adverse events, and medication usage in response to the vaccines or OMT was documented. Breakthrough cases with symptomology and medication usage was documented for both groups. The study was approved by the WesternU IRB committee, protocol #FB21/IRB026.
Summary of Results: Data for 91 subjects were analyzed with 41 male (45.1%) and 50 female (54.9%). Age distribution was comparable between the two groups. Side effects and medication usage reported by the subjects was similar between groups ($p>0.1$). AS IgG measured at baseline distinguished between previously infected individuals and those naïve to COVID-19, regardless of OMT treatment. For all time points measured, the average AS IgG in subjects trended higher in OMT group than control group. Two-way ANOVA analysis showed statistical significance at 1 week after 2nd injection ($p<0.001$) in the COVID-19 naïve population. 13 symptomatic breakthrough infections were reported in the control group and 12 in the OMT group. Length of symptoms were reported as 8.36 ± 4.60 days (control) and 4.62 ± 2.60 days (OMT) ($p<0.05$). Length of medication usage was 3.64 ± 3.58 days (control) and 1.23 ± 1.24 days (OMT) ($p<0.1$).
Conclusions: Both groups had comparable side effects after COVID-19 vaccination with no adverse events linked to OMT, indicating that OMT is a safe adjunct that can be used with COVID-19 vaccination. The data showed an enhanced immune response by OMT, as evidenced by increased levels of AS IgG in previously naïve subjects. Although both control and OMT groups had similar rates of symptomatic breakthrough infection, the OMT data shows reduced length of symptoms and medication duration in this population when compared to control breakthrough infections. This study is underpowered for statistical significance at each time point and future vaccination studies should recruit more patients to confirm the trends seen here.

 # 39

DISCREPANCIES IN MELOXICAM COX INHIBITION BETWEEN BALL PYTHONS AND HUMANS

Gilbert NR[1], Zhong V[2], Issar M[2], Fuchs S[2], Eng C[1]. [1]Western University of Health Sciences, Pomona, CA and [2]Western University of Health Sciences, Pomona, CA

Purpose of Study: *Python regius (P. regius)* and other reptiles are becoming more prevalent as house pets. Despite being used widely in veterinary medicine, not enough is known about the effects of non-steroidal anti-inflammatory drugs (NSAIDs) in snakes. Our study aims to characterize the pharmacologic action of meloxicam on cyclooxygenase (COX) in *P. regius.* Our hypothesis is that snakes and other vertebrates have a significant homology in their COX sequences and, thus similar pharmacological properties.

Methods Used: Human, and a species of snake and turtle COX sequences were compared using NCBI BLAST. COX preparation from snakes was obtained by homogenizing tissues from *P. regius*. A colorimetric enzymatic assay was used to evaluate COX activity and inhibition by meloxicam.

Summary of Results: Overall, COX sequences are substantially conserved among humans, and the species of snake, and turtle we compared. Among these species, the percent identity for COX-1 ranged from 72-74% and for COX-2 from 79-84%. In mammals, the half maximal inhibitory concentration (IC50) of meloxicam on COX-2 ranges from 1-10 mM. When used in *In vivo* snakes, meloxicam is typically used at 0.3-0.6 mg/kg, which allows a maximum plasma concentration of 10 mM. To our surprise, the inhibitory effects of the highest concentration of meloxicam in our assay at 500 mM resulted in only 30-50% inhibition of our snake COX preparations. In contrast, DuP-697, which is a strong COX-2 inhibitor in mammals, was highly active against snake COX as well.

Conclusions: Despite the highly conserved COX genetic sequences between humans and snakes, our preliminary results show that meloxicam is significantly less effective as a COX inhibitor in snakes compared to humans. Moreover, these results suggest that meloxicam is not a drug of choice analgesic/anti-inflammatory treatment in this species. Understanding the underlying reasons for differences in COX inhibition between phylogenetically diverse species such as humans and ball pythons could lead to the development of new, more-specific NSAIDs in humans.

 # 44

EXPLORING THE ROLE OF NA^+/K^+ ATPASE MEDIATED INFLAMMASOME ACTIVATION AS A POSSIBLE INTERVENTION AGAINST TUBERCULOSIS

Kishore P[1, 2], Reijneveld JF[2], Suliman S[2]. [1]Western University of Health Sciences, Pomona, CA and [2]University of California, San Francisco, CA

Purpose of Study: Despite the development of vaccines and treatments for Tuberculosis (TB), infection with Mycobacterium tuberculosis (Mtb) remains a leading cause of death from infectious disease. Infection with Mtb is what causes TB, however, only a small percentage of those infected develop TB. This suggests that differences between Mtb-infected hosts may determine who progresses to TB. Based on systems biology experiments from two human TB cohorts in Peru and Sub-Saharan Africa, higher Na^+/K^+ ATPase expression has been found to be associated with TB progression. Since higher Na^+/K^+ ATPase expression is associated with TB progression, we predict that lower expression of these pumps leads to a potassium efflux, which triggers the inflammasome complex and results in the release of Interleukin-1β (IL-1β), which is known to be involved in protection against TB disease progression.
Methods Used: Here, we begin to investigate whether pharmacological inhibition of Na^+/K^+ ATPases or knockout of TB-associated Na^+/K^+ ATPase encoding genes lead to an increase in IL-1β and therefore protection against TB progression. We inhibited the function of these pumps in THP1 cells using two methods: 1) CRISPR/Cas9 gene editing of ATP1B3, a Na^+/K^+ ATPase encoding gene which analysis of public RNA seq data revealed to be overexpressed in TB progressors 2) pharmacological inhibition of the pumps using cardiac glycosides such as Digoxin and Ouabain. We then tested inflammasome activation by measuring IL-1β release via ELISA and by measuring pyroptosis using a lactate dehydrogenase (LDH) cytotoxicity assay.
Summary of Results: Pyroptosis and IL-1β release was increased in cardiac glycoside treated cells, suggesting a potential difference in inflammasome activation when compared to controls. However, both increases were not yet found to be of statistical significance. Gene editing of ATP1B3 using CRISPR/Cas9 resulted in 0% knockout (KO).
Conclusions: Our preliminary results begin to suggest that pharmacological inhibition of Na^+/K^+ ATPases leads to inflammasome activation and therefore greater IL-1β release and pyroptosis, but further optimization of the assays mentioned above is needed. Gene editing results of ATP1B3 indicate the need for using different guide RNAs or reveal the crucial role of ATP1B3 in cell viability. Further investigating Na^+/K^+ ATPases, the subunits, and their expression will provide valuable insight into TB susceptibility and disease progression. Additional data will be needed to test whether cardiac glycosides could be repurposed as host-directed therapies to prevent TB progression.

 # 52

NEONATAL HYPOGLYCEMIA INDUCED AFTER INITIATION OF LATE PRETERM ANTENATAL CORTICOSTEROIDS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Purpose of Study: Preterm infants are at an increased risk for respiratory mortality compared to their at-term counterparts. Antenatal corticosteroids, when given to pregnant women, reduce respiratory morbidity in early pre-term infants. In late-preterm infants born 34-37 weeks, it appears the magnitude of reduction is much smaller, and potential harms such as neonatal hypoglycemia are still being investigated. In this meta-analysis, we analyzed the relationship between antenatal corticosteroid therapy and the risk of neonatal hypoglycemia in late preterm newborns.

Methods Used: A systematic review was conducted according to the Preferred Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines using Pubmed, EMBASE, Science Direct, and the Cochrane Library to identify studies with quantitative data on the association between neonatal hypoglycemia and antenatal corticosteroids. The search phrase was (hypoglycemia) AND (antenatal or prenatal or preterm) AND (corticosteroids or steroids or betamethasone or dexamethasone). Randomized control trials were assessed for risk of bias based on the criteria from Cochrane Handbook RoB 2.0. Nonrandomized studies were scored for quality using the Newcastle-Ottawa Scale. Data analysis and pooled differences of hypoglycemia were performed using Review Manager v5.3 (Mantel-Haenszel, random effects, Higgins I^2)

Summary of Results: Our search identified 335 articles, of which 11 studies (4 randomized control trials, 7 cohort studies) met inclusion for quantitative synthesis, comprising a total of 5,451 pregnant women. For the randomized trials, one had a low risk of bias, and the other three had an intermediate or high risk of bias. For the cohort studies, four were of good quality, two were fair, and one was of poor quality. The pooled results for the randomized trial revealed statistical significance for hypoglycemia (RR 1.61, 95% CI 1.38-1.87). The cohort studies also revealed statistically significant hypoglycemia (RR 1.56, 95% CI 1.24-1.96)

Conclusions: Overall, there is a higher incidence of hypoglycemia in neonates when antenatal corticosteroids were administered to women in late-term pregnancies. Stricter protocols for glucose management are needed in the care of newborns when antenatal corticosteroids are administered.

#81

ISCHEMIA CONTROLLED GENES IN ACCELERATED CARDIAL HEALING FOLLOWING MYOCARDIAL INFARCTION

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Purpose of Study: Myocardial infarction (MI) results in decreased cardiac function and can eventually lead to heart failure. In acute MI, the cardiomyocytes suffer ischemia and reperfusion injury. Rapid reperfusion leads to the production of reactive oxygen species and inflammation at the infarct zone sustaining the pathology. As a compensatory mechanism, the cardiac fibroblasts (CF) under ischemia release secretome containing the mediators that facilitate the regenerative responses; however, the integral role of CF secretome in cardiac regeneration is largely unknown. Here, we designed a study to understand the response of the secretomal mediators from CF following in vitro simulated-ischemia.
Methods Used: CF were isolated from Yucatan miniswine and cultured under standard conditions. One group of the cells were then exposed to simulated-ischemia conditions using an ischemic buffer (118 mM NaCl, 24 mM Na2HCO3, 1 mM Na2HPO4, 2.5 mM CaCl2, 1.2 mM MgCl2, 20 mM sodium lactate, 16mM KCl, and 10mM 2-deoxyglucose; pH 6.2) for 24 hours. The second group was exposed to the same ischemic buffer for 2 hours and then reperfused through reversion to culture media for 22 hours. The control group was left untreated in culture media. The released protein mediators were analyzed via LC MS/MS mass spectroscopy. Expression status of the identified mediators were then evaluated in the CF using Western blot and qRT-PCR.
Summary of Results: Upregulation of 6 key genes were identified in the secretome of ischemic CF: Troponin I, HSP27, HSP90, Nrf2, CRSP2, and Cofilin. The ischemic CF demonstrated significant upregulation of CRSP2, HSP90, and Cofilin at the transcript level when compared to reperfused CF and unchallenged control. Moreover, Western blot analysis revealed the upregulation of HSP27, Nrf2, and Troponin I in the ischemic CF, whereas HSP90, HSP27, and Troponin I were decreased in the reperfused CF.
Conclusions: Cardiac fibroblast response to a simulated-ischemic environment at the transcriptional and protein level implies an upregulation of various genes necessary to return to normal physiological function. The upregulation of HSP90, HSP27, and Nrf2 demonstrates the ability of cardiac fibroblasts to protect from ischemic and oxidative damage.

#84

POINT OF CARE ULTRASOUND IN DIAGNOSING REGIONAL WALL MOTION ABNORMALITIES IN PATIENTS WITH ST SEGMENT ELEVATED MYOCARDIAL INFARCTION

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Purpose of Study: The purpose of this study is to determine if cardiac point-of-care ultrasound (POCUS) can detect regional wall motion abnormalities (RWMA) in patients presenting to the emergency department with chest pain and ST-segment elevation myocardial infarction (STEMI). Given the time sensitive nature of percutaneous coronary intervention and high mortality rates from myocardial infarction, identifying a regional wall motion abnormality within seconds of occlusion may drastically improve patient outcomes.

Methods Used: Adult patients in the Emergency Department (ED) who met criteria for STEMI activation were prospectively enrolled. Any patients presenting to the ED with EKG that met the criteria for STEMI activation were eligible for enrollment in this study. During enrollment, patients underwent a parasternal short-axis ultrasound and any regional wall motion wall abnormalities were documented. The ED physician performing the ultrasound recorded any existing regional wall motion abnormalities (RWMA) of the anterior, posterior, or lateral wall based on ultrasound findings. All patients enrolled in the study also underwent cardiac catheterization which was the gold standard. The POCUS results were later compared to the findings obtained through the cardiac catheterization report from the attending cardiology physician.

Summary of Results: To date, we have enrolled 14 patients in this study. Data analysis showed a 100% specificity and 100% sensitivity in detecting the presence of any coronary artery occlusion in the heart, regardless of the location of the occlusion. We found a sensitivity of 36.4% and specificity of 33.3% in localizing the specific occlusion to the left anterior descending artery. In contrast, we found a 60% sensitivity and 75% sensitivity in detecting a right coronary artery occlusion. Our results thus far demonstrate that a RWMA finding on POCUS is highly sensitive and specific for identifying the presence of an occlusion in any coronary artery. Thus far, we have low sensitivity for localizing the occlusion to the left anterior descending artery and moderate sensitivity and specificity for localizing it to the right coronary artery.

Conclusions: This study is currently ongoing, but our preliminary data strongly suggest that POCUS may be useful in identifying regional wall motion abnormalities in patients with STEMI activation in the ED. To confirm these results, we are actively recruiting more patients to validate our early findings.

 # 97

HOME BIRTH IS TRENDING: ATTITUDES AND PRECEPTIONS OF HOME AND HOSPITAL BIRTH ON TIKTOK

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Purpose of Study: During the COVID-19 pandemic, patients avoided hospitals for many conditions, including giving birth. When compared to births in 2019, home births increased by 22% in 2020 and neonate outcomes worsened. Apgar scores of 0-3 and preterm births increased by 35.9% and 39.3% respectively. Previous studies have examined why patients choose home birth, but there has not been a recent study using social media as a source to identify these reasons. In this study, we identified themes in TikTok comments and posts to describe current attitudes toward home birth as it becomes a more prevalent choice in birth location among people despite the fact it is associated with worse birth outcomes.

Methods Used: Using the search terms "home birth" and "home vs. hospital birth," videos were extracted from TikTok 's database and sorted by relevance to the search query. Video posts were reviewed for inclusion criteria: a minimum of ten comments, in English, in the date rage of January 2017- July 2022, and discussing birth within the United States. Inductive thematic saturation was used to classify the themes within the included video posts and proceeding comments. Once thematic saturation was reached in the comments, defined as ten consecutive comments with no new themes, the next post in the search results was reviewed. When 10 consecutive new posts with no new themes were found, the next search term was examined. All themes were extracted from each post and comment. The subjective importance of each of the themes within a post or comment were not identified.

Summary of Results: The search yielded 352 posts and 34,439 comments. 115 posts and 1024 comments met inclusion criteria. Overall, 71.3% of posts were supportive of home birth, 17.4% were opposed, and 11.3% were neutral; 70% of posts were from 2022 and nearly all the rest from 2021. Fourteen supportive themes such as desire to control the birth environment and experience, perceived danger in hospital birth, desire for fewer medical interventions, and personal stories were identified while ten themes in opposition emerged such as the perceived danger of home birth, desire for medical interventions, and personal birth experience. Three themes focused on an individual's right to make their own choices were identified as neutral. Analyzing the total theme counts: 894 supported home birth, 359 opposed it, and 172 were neutral.

Conclusions: The COVID-19 pandemic brought the topic of home birth to the forefront. Women appear to be drawn to home birth because it is an environment where they have control and feel safe and comfortable. This study's results may be used to understand current attitudes of a vocal minority toward home birth, improve counseling patients received from physicians, and be implemented to improve hospital birth experiences.

 # 102

IMPACT OF A SEMI-AUTONOMOUS TREATMENT ALGORITHM ON FETAL HEART RATE TRACING FOR THE MANAGEMENT OF SEVERE HYPERTENSION IN PREGNANCY

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Purpose of Study: This retrospective cohort study examined whether the implementation of a semiautonomous treatment algorithm for the management of severe hypertension in pregnancy is associated with nonreassuring fetal heart rate status, specifically late decelerations and minimal variability.

Methods Used: This was a single-center retrospective cohort study at a tertiary care academic hospital of patients treated for severe hypertension. All patients with pregnancies beyond 20 0/7 weeks of gestation through delivery were eligible. Patients were excluded if the preeclampsia episode occurred post-partum or if fetal tracing was inadequate. The cohort was divided into three groups: pre-implementation, during implementation, and post-implementation.

Each patient was searched in the EMR. Fetal heart rate tracings were viewed for up to one hour after anti-hypertensive administration. Primary outcomes included fetal heart rate deceleration and minimal variability. Secondary outcomes included NICU events, neonatal seizures, and neonatal intubation. All data was documented into an excel sheet. To compare differences pre-implementation, during implementation, and postimplementation of SATA, variables were compared using the chi-squared test.

Summary of Results: There were no differences in the proportion of late decelerations or minimal variability between groups. Late decelerations occurred in 4 patients in the pre-implementation group (2.16%), 2 patients in the during implementation group (1.33%), and 5 patients in the post implementation group (3.97%). Minimal variability occurred in 17 patients in the pre-implementation group (9.19%), 12 patients in the during implementation group (8.00%) and 15 patients in the post implementation group (11.90%).

Both NICU events and neonatal seizures did not vary between groups. The proportion of NICU events was 41.38% pre-implementation, 41.18% during implementation, and 38% post-implementation (P=0.72). Neonatal seizures occured 0.69% pre-implementation, 0.42% during implementation, and 0% post-implementation (P=0.503). The proportion of patients requiring neonatal intubation was associated with the during implementation group (17.23%), 4.48% of the pre-implementation group and 8.0% of the post implementation group required intubation (P= 0.0033×10^{-3}).

Conclusions: This study found no association between the implementation of a semiautonomous treatment algorithm and non-reassuring fetal heart rate tracings. Furthermore, the implementation of the semi-autonomous treatment algorithm did not lead to adverse fetal events, such as increased NICU stays and the number of neonatal seizures. This study supports the American College of Obstetricians and Gynecologist guidelines, recommending the administration of anti-hypertensives within 30-60 minutes with no increased adverse fetal events.

FHR Tracings and Neonatal Event Comparisons Between Groups

Category	Pre-Implementation	During Implementation	Post-Implementation	p-value
Late Decelerations	4 (2.16)	2 (1.33)	5 (3.97)	0.35
Minimal Variability	17 (9.19)	12 (8.00)	15 (11.90)	0.53
NICU	120 (41.38)	98 (41.18)	76 (38.00)	0.72
Neonatal Seizures	2 (0.69)	1 (0.42)	0 (0)	0.503
Neonatal Intubation	13 (4.48)	41 (17.23)	16 (8.00)	0.0033x10-3

 # 112

AN INTERNATIONAL COMPARISON OF PHOSPHODIESTERASE-5 INHIBITOR ASSOCIATED MELANOMA

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Purpose of Study: To define and compare the sudden increase in melanoma cases associated with erectile dysfunction relieving drugs, Viagra and Cialis, between the United States and European Union.
Methods Used: The United States Food and Drug Administration Adverse Event Reporting (FAERS) database and EudraVigilance - European database of Suspected Adverse Drug Reaction Reports were analyzed for annual changes across multiple types of melanoma in association with Viagra (sildenafil citrate) and Cialis (tadalafil).
Summary of Results:
In 2019, the USA FAERS database recorded a total of 1296 melanoma cases with Viagra use and 791 cases with Clialis use, demonstrating a 693% and 462% increase respectively, in comparison to year 2018. The 2019 EudraVigilance database also recorded a total of 1085 melanoma cases with Viagra use and 702 cases with Cialis use with a 687% and 315% increase in melanoma cases respectively, in comparison to year 2018. Most common type of reported melanoma was malignant melanoma.
For the FAERS database, adverse effects are reported by patients, physicians or healthcare professionals without verification. The total reported cases may carry redundancy due to potential repeated reports per patient for different types of melanoma.
Conclusions: Reported melanoma cases with Viagra and Cialis use peaked in 2019 in comparison to annual case counts from 2010 to 2018 in both the FAERS and EudraVigilance database. Malignant melanoma was the most commonly reported type of melanoma. There was no significance in the difference in case numbers between USA and European data groups, nor Viagra and Cialis groups, suggesting a simultaneous increase in melanoma cases across Europe and the USA across both drugs in the year 2019. The EudraVigilance database verifies reports of adverse side effects with medicine regulatory authorities and minimizes repeated reports. Therefore, the statistically insignificant difference between EudraVigilance and FAERS shows that the melanoma spike in the US was consistent with Viagra and Cialis use rather than external factors.

 # 132

MEMORY-RELATED REGULATION OF EXTRACELLULAR MATRIX IN THE HIPPOCAMPUS OF ANGELMAN SYNDROME MICE

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Purpose of Study: Perineuronal nets (PNNs), a complex extracellular matrix (ECM) condensed around neurons, play critical roles in learning and memory. Our preliminary RNA-Seq results revealed a marked difference in gene expression in the hippocampus between wild-type (WT) and Angelman Syndrome (AS) mice with or without (control) fear memory recall, especially for genes encoding ECM proteins. We thus further investigate levels of ECM proteins and PNN features in WT and AS mice.
Methods Used: Immunofluorescent staining was performed on fibronectin-1 (Fn1), a major component of the ECM, and GAD67, a marker of interneurons closely related to PNNs. Each were co-stained with Wisteria floribunda agglutinin (WFA), a well characterized PNN marker.
Adjacent sections of dorsal hippocampus from WT and AS control mice (N=3) were incubated with biotin-conjugated WFA lectin (1:100, Sigma Aldrich L1516) and anti-GAD67 (1:200). Another twelve sections (WT control, AS control, WT recall, and AS recall, N=3) were incubated with biotin-conjugated WFA lectin (1:1000) and anti-Fn1 (1:100). Sections were washed with PBS prior to incubation in streptavidin Alexa-568, followed by a wash with 0.3% PBST. Sections were then blocked with goat serum before being incubated with either GAD67 or Fn1 antibodies. After washes, sections were then incubated with corresponding secondary antibodies, goat anti-mouse IgG Alexa-594 and goat anti-rabbit IgG Alexa-594 for GAD67 and Fn1, respectively.
Summary of Results: In comparing the number of stained cells for WFA, GAD67, and Fn1 between WT and AS mice, only the WT recall mice that underwent fear-conditioning and memory recall were observed to have significantly more WFA positive cells. There were no significant differences of GAD67 and Fn1 positive cells between WT and AS mice. Additionally, WFA staining intensity in the CA2 region of the hippocampus of WT control mice was significantly higher than AS control mice. We also noticed other changes after memory recall between WT and AS mice, such as Fn1 positive cells and FN1/WFA co-localization in WT recall mice compared to control mice; however, due to the small number of animals used, these changes are not significant.
Conclusions: WFA-staining intensity was significantly higher in the CA2 region of the hippocampus of WT mice as compared to AS mice. Furthermore, contextual fear memory recall significantly increased the number of WFA-positive cells in hippocampus of WT mice but not AS mice. Although these findings are preliminary, they confirm that PNNs play an important role in learning and memory, and that dysregulation of extracellular matrix, including PNNs, might contribute to memory impairment in AS.

 # 147

VEGF AND ANGIOPOIETIN AS REGULATORS FOR ANGIOGENESIS IN PERIPHERAL ARTERY DISEASE

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Purpose of Study: The goal of our research is to find a novel approach to treat Peripheral Arterial Disease (PAD) by promoting the process of angiogenesis in ischemic events. Surgical revascularization has been a preferred treatment for severe PAD, but clinical studies have shown variable outcomes in preventing the formation of ulcers and amputations. Moreover, PAD tends to affect the older population, with other comorbidities, that complicate surgical options and lead to poor outcomes. This study aims to investigate the roles of VEGF and angiopoietin genes in inducing angiogenesis in the swine model of chronic limb ischemia. Angiogenesis has been shown to produce collateral vessels towards tissues that require more perfusion. In instances of ischemia due to PAD, angiogenesis can be utilized as a safer alternative for perfusing regions of ischemia.

Methods Used: To investigate angiogenesis in the hind limb of the swine model of chronic limb ischemia, we worked with femoral arteries from 5 animals receiving 1-week, 2-week, or 4-week ischemia treatments on one limb, and the contralateral limb was left intact to serve as a control. Tissue sectioned from the femoral arteries was stained using H&E, trichrome, and pentachrome techniques for histomorphometric analysis.

We used immunohistochemistry to investigate the expression of our target genes. Quantification was done via ImageJ software.

Summary of Results: Using the t-test, we found that the expression of VEGF was 27% higher in the control group compared to the treatment group ($p<0.05$). The expression of Angiopoietin was 70% higher in the control group ($p>0.05$). Interestingly, VEGF has a higher expression in 1-week ischemia treatment compared to 2-week ischemia treatment ($p<0.05$) and 4-week ischemia treatment ($p>0.05$). Angiopoietin showed a similar finding in the 2-week treatment ($p<0.01$) and 4-week treatment ($p<0.01$). These findings are opposite to our initial hypothesis that the expression of these 2 genes would be uniformly higher in the treatment models.

Histological findings indicated an increased formation of new capillaries that represents the upregulation of angiogenesis in ischemia.

Conclusions: Typically, angiogenetic factors such as VEGF and angiopoietin are upregulated in ischemic tissues, whereas our results showed downregulation. This means there may be a set of other genes being regulated to induce angiogenesis in the ischemic samples. When observing the effects of ischemia systemically, VEGF has been shown to decrease in ischemia in conjunction with other organ failures. For example, increased albumin levels from ischemic damage can decrease VEGF levels via blunting the HIF pathway. As such, further testing would involve investigating other genes such as HIF and IL-6 that may be associated with VEGF and angiopoietin signaling pathways and play significant roles in the overall regulation of the angiogenesis process.

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TOWARDS NEW ANTIMICROBIALS - TARGETING BACTERIAL RESPONSE REGULATORS

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Purpose of Study: Antibiotic resistance remains one of the largest healthcare and public health challenges. Several studies have documented that the spread of antibiotic resistant bacteria in nosocomial settings has been exacerbated worldwide due to increased rates of hospitalization and intubation in the wake of the COVID-19 pandemic. One way to address antibiotic resistance is to identify novel compounds that inhibit essential microbial processes. Two-component regulatory systems are important mediators of signal transduction that allow bacteria to communicate with and respond to changes in their environment. The WalRK system is a two-component system that is conserved and essential for viability in many Gram-positive human pathogens. We hypothesize that a ligand that specifically binds with the DNA-interaction surface of the WalR protein can lead to cell death and can serve as a lead compound for future drug development efforts.
Methods Used: We describe the development process of an assay to identify WalR binding compounds. In silico molecular dynamics docking approaches were utilized to identify potential WalR binding compounds from virtual compound libraries. To assess their WalR-binding capacity in vitro, overexpression strains for several WalR recombinant constructs were engineered and protein constructs were purified to homogenicity. Isothermal titration calorimetry (ITC) is a technique that measures heat release or absorption when two molecules interact. A MicroCal PEAQ ITC instrument was utilized to develop a WalR-binding assay.
Summary of Results: WalR is a two-domain protein featuring a regulatory and a DNA-binding domain. Two constructs, a truncated DNA-binding domain and a full-length protein construct proved soluble, and pure quantities necessary to conduct ITC measurements could be successfully obtained (12 mg full-length protein and 23 mg truncated protein). These proteins were amenable to ITC experiments. We found that experiments were best run with at least a two-fold increase of ligand concentration to protein concentration supplied in identical buffer conditions over nineteen injections. We are currently assessing the binding affinities of our in silico hit compounds.
Conclusions: Our results show that ITC enables the detailed, rapid, and reproducible characterization of the binding relationship between the DNA-binding domain of the WalR protein and any potential ligands. The protocol discussed herein will enable further drug discovery studies on the WalR response regulator protein to identify and characterize inhibitors, providing insight towards the development of novel antimicrobial compound

#182

DIAGNOSTIC CHALLENGES IN THE DETECTION OF ATYPICAL STAPHYLOCOCCAL SEPTIC ARTHRITIS

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Case Report: Synovial joints are prone to infection by hematogenous seeding through systemic infection, direct injury, puncture injury, and intra-articular injections. Septic arthritis often presents as monoarticular in the knee or hip with associated signs of joint pain, fever, effusion, and limited range of motion. Here, we report the case of a 47-year-old male presenting to the emergency department (ED) with right hip pain and a history of type 2 diabetes mellitus. He presented with right lower extremity pain and limited range of motion without erythema, swelling, or fever. X-ray imaging was normal, and the patient was discharged. One month later, primary care physician (PCP) identified elevated white blood cell (WBC) count and referred patient to ED. Vital signs were normal. Labs showed elevated WBC count, glucose, erythrocyte sedimentation rate and c-reactive protein. An arthrocentesis was attempted but no fluid could be aspirated. Physical exam noted right lower extremity pain with internal rotation and external rotation, inability to perform a straight leg raise, diffusely tender to palpation over hip flexors, and no appreciable swelling. The patient was able to ambulate to bathroom but had discomfort bearing weight. Subsequent MRI revealed extensive edema surrounding musculature and soft tissue of the right proximal femur. Blood and wound cultures revealed rare Methicillin Sensitive Staphylococcus Aureus (MSSA) only resistant to penicillin. An incision and drainage (I&D) procedure was performed on the right hip with drainage culture negative. One month later, the patient was admitted to a new hospital with worsened symptoms. He was diagnosed with septic arthritis and abscess of right femoral head with acute osteomyelitis. I&D of the right hip joint, adjacent fluid collection and resection of femoral head (Girdlestone procedure) was performed. MRI of left spine revealed multilevel degenerative changes with moderate to severe bilateral neural foraminal narrowing at L5-S1. The patient was discharged to skilled nursing facility with cefazolin and referred to orthopedic surgery for hip replacement surgery. He presented to PCP for follow up with improved symptoms and new diabetes management.

Timing is crucial in the management of septic arthritis due to potential rapid joint destruction. Patients with diabetes are at increased risk of joint destruction and should be monitored carefully for bacteremia and joint pain. Joint aspiration is considered the gold standard for diagnosing septic arthritis. However, in atypical cases in which diagnostic arthrocentesis is dry, imaging is negative, and symptoms are atypical, other diagnostic features should be considered. Serum blood tests lack adequate sensitivity but should be obtained to help identify the source if synovial fluid culture is negative. Point-of-care ultrasound may also aid in identifying intra-articular effusion and guiding aspiration.

#197

PRIMARY CUTANEOUS DIFFUSE LARGE B-CELL LYMPHOMA, LEG TYPE PRESENTING AS HYPERCALCEMIA AND CELLULITIS – A CASE REPORT

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Case Report: Primary cutaneous diffuse large B-cell lymphoma, Leg Type (PCDLBCL, LT) is a rare, aggressive type of non-Hodgkin B cell lymphoma which is limited to the skin at diagnosis. While hypercalcemia can be associated with lymphoma, it is rarely associated with PCDLBCL, LT
HPI: An 87 year old male with a past medical history of atrial fibrillation, diabetes, chronic kidney disease stage 3, benign prostatic hyperplasia, and hypothyroidism presented to the hospital with anorexia, progressive lower extremity weakness, facial droop, and slurred speech x 1 week. He was diagnosed with hypercalcemia due to thiazide use, treated with normal saline and calcitonin, and discharged. He returned to clinic one month later for left lower extremity cellulitis that was refractory to a 14-day course of Bactrim. He was then sent by vascular surgery to the ED for further workup. Review of systems positive for weakness, memory loss, confusion, and easy bruising. Physical exam revealed painful left lower extremity violaceous lesions. Initial calcium level 14.9, PTHrP 11, PTH 5.3, and total Vitamin D 90. SPEP negative. A CT scan of the leg showed gross enlargement and heterogeneity of the muscle. A metabolic bone survey did not reveal osteolytic or osteoblastic lesions. A biopsy of the lesion revealed primary cutaneous diffuse large B-cell lymphoma with cell coexpression of CD45, CD20, BCL-2, BCL-6, MUM1 and cMyc. Surgery and hematology were consulted, but the family elected for hospice care given the advanced nature of the disease.
Discussion: While hypercalcemia has been associated with lymphoma, it is an atypical presentation of PCDLBCL, LT. Typically, hypercalcemia found in lymphoma is mediated by calcitriol rather than PTHrP. When considering malignancy induced hypercalcemia, patients should be screened for lymphoma with a workup that includes calcitriol, PTH and PTHrP. Additionally, PCDLBCL, LT can present as cellulitis, often leading to misdiagnosis. For patients with concurrent cellulitis refractory to antibiotics and hypercalcemia, PCDLBCL, LT should be considered as a diagnosis given its poor prognosis.

Violaceous nodules on the left lower extremity

#211

COVID-19 BOOSTER VACCINE RELATED DERMATITIS: A CASE STUDY

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Case Report: A 28 year old male with a past medical history of hypothyroidism and positive ANA presented to an outpatient dermatology clinic with a diffuse pruritic rash two weeks after the administration of his first Moderna COVID booster vaccine. He denied any other accompanying symptoms such as fever or chills as well as any similar rashes to prior doses of the Moderna COVID vaccine.

The rash consisted of pink erythematous minimally scaly papules, thin plaques and patches involving the left and right dorsal hands, forearms, wrists, face, neck and left shoulder. The remainder of the patient's skin including the bilateral lower extremities, the eyelids, conjunctiva and oral mucosa was clear. The patient denied any similar rashes in the past.

The patient denied any allergies to medications, or food or environmental allergies. He denied any notable contact allergen exposures, including to soaps, lotions, and cosmetic products. The patient also denied any significant family history or past surgical history. The patient was on Armour Thyroid for hypothyroidism and testosterone for low levels since age eighteen. The patient was started on cetirizine 10 mg once daily for the rash with minimal improvement.

Autoimmune workup for the rash was notable for an elevated anti-RNP and as the patient's past medical history included Raynaud's phenomenon and ANA positivity for ten years, the patient was diagnosed with mixed connective tissue disease (MCTD). Autoimmune conditions can often have an indolent course, where symptoms progressively develop and worsen. MCTD is an autoimmune overlap syndrome that can consist of the following three connective tissue diseases: systemic lupus erythematosus, scleroderma, and polymyositis.

Millions of individuals across the world are receiving COVID vaccines to protect themselves and members of their community, and it is of utmost importance that we continue to investigate adverse events. Although of low incidence, these rare effects have the ability to impact large numbers of people within both healthy and immunocompromised populations. It is critical that we examine and document them in a rigorous manner, to ensure safe vaccine delivery and reassure the public about vaccine safety overall.

#231

OUT OF AFRICA HUMAN MIGRATION AND SKIN PIGMENTATION ADAPTATION: A REVIEW ON THE EVOLUTIONARY VITAMIN D ADAPTATION HYPOTHESIS

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Purpose of Study: In this review, we analyze the level of support for the hypothesis that the lightening of skin observed throughout evolution and migration is related to maintaining effective vitamin D synthesis in Northern, low ultraviolet radiation regions. Understanding the main driver in skin lightening in the context of human migration can assist providers in strengthening their ability to explain sun protection initiatives and their relationship to vitamin D synthesis.
Methods Used: PubMed, Embase, and Cochrane Review search engines were used to generate research articles published within the last 12 years (2010-2022) regarding the influence of sunlight- dependent production of vitamin D on skin pigmentation lightening through historical migration patterns. The following search criteria was used: evolution AND vitamin AND d AND skin AND [2010-2022]/py. Of the 229 articles generated, 154 articles were excluded as they did not discuss human skin pigmentation regarding evolution and Vitamin D. An additional 34 articles were excluded for either lack of explanation about the mechanism or the type of article. The remaining 39 articles were analyzed for their findings and graded according to the Strength of Recommendation Taxonomy (SORT) scale. Articles were classified as “supportive” if the author(s) concluded that vitamin D was the primary driver of evolutionary skin lightening, “against” if the author(s) concluded that vitamin D was not the primary determinant and provided appreciable evidence against the vitamin D theory, and “neutral” if author(s) provided both supporting and opposing findings that made the paper indeterminate in its conclusion.
Summary of Results: A total of 39 studies were included and analyzed for this review. The first authors were represented by 37 different specialties, with anthropology and endocrinology being the most prevalent. Genomic analysis/sequencing/GWAS was the most common method of analysis. There were a total of 26 supportive articles, 10 neutral articles, and 3 against articles classified during this review. The primary explanation of vitamin D synthesis as the primary driver for skin lightening is the migration of humans out of Africa to Northern latitudes with less ultraviolet radiation which prompted modifications of a complex network of genes related to vitamin D and skin color in order to protect against vitamin D deficiency and its subsequent health outcomes.
Conclusions: The current published research supports the hypothesis that vitamin D synthesis is a primary driver for evolutionary skin lightening due to decreasing UVB exposure when populations migrated to northern latitudes. Due to heterogeneous cohorts and conservative data analysis, GWAS studies run the risk of type II error yielding a limitation in our data analysis. This information can be used by healthcare providers to educate patients on sun protection given the lesser threat of severe vitamin D deficiency in developed communities today that have access to adequate nutrition and supplementation.

#232

HOW FAMILY STRUCTURE AND CHILDHOOD HEALTH CARE ACCESS INFLUENCE CAREER CHOICES IN THE MEDICAL FIELD: A SURVEY OF OSTEOPATHIC MEDICAL STUDENTS

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Purpose of Study: This study investigated how childhood experiences might relate to medical students' anticipated career choices. Our hypothesis was that access issues to health care early in life for parents and children may have impacts on future career goals of osteopathic medical students including their intention to choose careers in primary care, desired geographic location of practice (rural versus urban), and desired patient population demographics, especially underserved communities.
Methods Used: We conducted an anonymous, voluntary survey of students at COMP and COMP-Northwest in which we first asked about household structure, income, health insurance status, illnesses of family members, and barriers to medical services when the students were less than 16 years of age. Most questions were multiple choice. We analyzed the frequency of the responses to each question. We then studied possible associations between early barriers to health care and student career choices. For these, we used chi square and Fisher's exact tests with $p < 0.05$ as a statistically significant cut-off.
Summary of Results: We received a total of 152 responses for a 15% response rate. Over half (57%) of respondents were in their preclinical years. Most students (85%) spent most of their youth in two-parent families; 9% were in single-parent. Eleven percent were only-children. Low family income of <$25,000 was represented by 7%; 30% were <$75,000. Nearly a quarter (26%) were relied upon to translate for family members in medical settings. One in five (21%) said parents lacked health insurance; 8% had lost a parent figure to health problems. We found a statistically significant association ($p = 0.025$) between perceived interactions with the health care system and careers in primary care. We found no other associations between the variables studied and career plans.
Conclusions: There was little association between family financial difficulties or health care access issues early in life with any career path choices, either primary care or caring for underserved populations. Some limitations exist within this study. Preclinical students were represented in greater proportions than third- and fourth-years. Thus, most survey respondents had not yet gone through clinical rotations, which likely plays a role in determining career goals. Many students indicated they were undecided on career choices at this time. A future study could be done surveying only students in clinical years, as they likely have refined their desired medical careers. Furthermore, we speculate that specialty choice and the communities in which medical students desire to work in are affected by more than childhood experiences alone. Larger contributing factors may be income expectations, residency length, personality fit, clinical experiences after 16 years of age, and others.

#242

DUPLICATED INFERIOR VENA CAVA - A CASE STUDY

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Case Report: The Inferior Vena Cava (IVC) is a large, retroperitoneal vein that ascends along the right side of the vertebral column. It is typically formed from a confluence of the left and right iliac veins, and drains deoxygenated blood from the abdomen, pelvis, and lower extremities. Structure variations of the IVC can occur due to abnormalities in regression or persistence of several embryological veins. Upon routine dissection of a donated cadaver, we discovered the presence of a rare vascular phenomenon: a duplication of the IVC. Our cadaver presented with the main IVC split around T9 into two equal-sized right and left IVCs, with each vessel continuing separately into the right and left external and internal iliac veins. With this dramatic change in vasculature, the presence of a duplicated IVC can pose unique difficulties in some individuals. However, given the rarity of the condition (0.2% - 3%) there is little research available to adequately address its presence. Our goal was to clearly define the characteristics of this marked variation and provide clinical insight into potential complications. **Methods:** The donor patient was embalmed in a formalin/water mixture solution and subsequently dissected. After discovery, we applied reverse dissection techniques and achieved a clear visualization. Prompted by our findings, we conducted a systematic literature review of medical complications related to duplication of the IVC. **Results:** Upon visual analysis, renal venous return was separated, with the left and right renal veins returning to the left and right IVC, respectively. In addition, the IVC did not reconnect after its split, making this variation even more rare. Duplication of the IVC alone is not a primary risk factor for venous thromboembolism (VTE) but coupled with other risk factors, special consideration should be given when assessing cardiovascular health. High risk individuals with symptomatic duplication often experience their first thrombosis at an age of 35 or younger. While a typical patient with deep vein thrombosis (DVT) may present with classic signs of lower extremity edema and claudication, individuals with IVC duplication may report initial symptoms associated with the thorax, abdomen, and genital region. After appropriate diagnosis of DVT, modulations to standard treatment paradigm may be required. This may include actions such as bilateral filter placement to prevent embolism if performing caval interruption. In addition, given the lack of clear guidelines, we suggest that patients under age 35 with high risk for thrombosis are potential candidates for asymptomatic imaging of the IVC.
Conclusions: There are no standardized guidelines for detection of this venous abnormality; the development of guidelines and the link between VTE and duplication of the IVC would benefit from further research.

 # 273

CARDIAC REGENERATIVE POTENTIAL OF EPICARDIAL ADIPOSE TISSUE-DERIVED STEM CELLS

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Purpose of Study: Ischemic heart disease is the leading cause of death worldwide. Myocardial infarction causes the death of cardiomyocytes followed by cardiac remodeling and formation of non-contractile fibrotic tissue. This leads to ventricular hypertrophy and congestive heart failure. Currently, treatments for ischemic heart disease focus on pharmacological interventions in an attempt to prevent the reoccurrence of ischemic attacks and heart failure. There remains to be a lack of treatment options to restore the cardiac contractility and function. Recent studies of adipose derived multipotent stem cells have discovered their capacity to differentiate into mesenchymal cell phenotypes, including into cardiac cells, and thus promising cardiac regeneration. We hypothesize that epicardial adipose tissue-derived stem cells (EAT-DS) possess immense potential for the differentiation towards a cardiomyocyte lineage owing to an anatomic relationship and proximity to the myocardium. This study aims to induce differentiation of EAT-DS towards a cardiomyocyte lineage using 5-azacytidine.
Methods Used: EAT-DS was isolated from Yucatan miniswine and cultured following the standard procedures. Group I cells were treated with a 10 mM 5-azacytidine solution for 24 hours and Group II cells were challenged with ischemia for 48 hours followed by a 48-hour treatment with 10 mM 5-azacytidine. Following the treatments, cells continued proliferation for 21 days and the expression status of the key cardiomyocyte biomarkers, Gata4, NKX 2.5, a-SMA, connexin 43, IRX 4, cardiac troponin 1, and TBX 5, were determined using qRT-PCR, immunofluorescence and Western blot analysis. Untreated cells served as control.
Summary of Results: The treatment of EAT-DS with 5-azacytidine increased transcripts and proteins levels of Gata4, NKX 2.5, a-SMA, connexin 43, IRX 4, cardiac troponin 1, and TBX 5. The upregulation of these biomarkers was significantly greater in 5-azacytidine- treated EAT-DS compared to ischemia/5-azacytidine treated cells. Additionally, ischemia induced embryoid bodies in the 5-azacytidine treated cells starting around day 9 of incubation following treatment.
Conclusions: 5-azacytidine treatment significantly increased the gene expression of cardiac specific biomarkers in EAT-DS, indicating the trend towards cardiomyocyte differentiation. In ischemic cells, 5-azacytidine stimulates embryoid body formation by initiating the three-dimensional tissue formation. Overall, these results support the potential of EAT-DS to be an ideal candidate for cardiac regeneration.

 # 310

EXON 6 DELETION IN LIPASE MATURATION FACTOR-1 AS A CAUSE OF FAMILIAL CYHLOMICRONEMIA SYNDROME

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Purpose of Study: Familial Chylomicronemia Syndrome (FCS) is a autosomal recessive disorder presenting with severe hypertriglyceridemia resulting from impaired lipoprotein lipase (LPL)-mediated clearance of plasma triglycerides. While most cases of FCS are due to genetic defects in the LPL gene, mutations have also been identified in lipase maturation factor-1 (LMF1), a lipase-chaperone required for the post-translational maturation of LPL into active enzyme. Recent genetic studies in FCS patients identified a homozygous genomic deletion including exon 6 of the LMF1 gene and a silent mutation predicted to affect splicing and cause skipping of the same exon. Both mutations are predicted to result in an in-frame deletion of 56 amino acids in the LMF1 protein. In the present study, we sought to assess the impact of loss of exon 6 sequences on the function of LMF1 to further the body of work investigating the association between LMF1 mutations and FCS, and gain insights into LMF1 structure-function relationship.
Methods Used: LMF1 function was assessed in an in vitro assay based on the reconstitution of LPL-maturation activity in LMF1-deficient cells. Exon 6 deletion was generated in a Luciferase-LMF1 cDNA fusion construct via site directed mutagenesis and the mutant plasmid was co-transfected with LPL into LMF1 knock-out HEK293 cells. LPL activity secreted into the culture medium, a proxy for LMF1 activity, was assessed using a fluorescent substrate and LMF1 protein mass was determined by luciferase assays. LMF1 specific activity was calculated as the ratio of LPL activity over LMF1 mass.
Summary of Results: Deletion of exon 6 sequences had no effect on LMF1 protein expression, but completely abolished its LPL-maturation activity.
Conclusions: Our results suggest that mutations resulting in the loss of exon 6 sequences in LMF1 are responsible for LPL deficiency and hypertriglyceridemia, and represent rare genetic causes of FCS. Our study also implicates the protein domain corresponding to exon 6 as a critical determinant of LMF1 function. LMF1 is a polytopic membrane protein of the endoplasmic reticulum (ER) and exon 6 encodes a soluble domain facing the ER lumen, the site of interaction with LPL. Thus, we hypothesize that the 56-aa region implicated in lipase maturation by the present study may include the interface between the LMF1 and LPL proteins. Future studies will focus on the role of exon 6 in the LMF1-LPL interaction to gain further mechanistic insights.

This work was supported by NIH grant HL154071.

 # 328

ROTATOR CUFF HEALTH AND EMERGING THERAPIES FOR TREATMENT: A LITERATURE REVIEW

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Purpose of Study: Rotator Cuff Injuries (RCI) are a very prevalent cause of shoulder pain affecting over 20% of the population in the USA. Surgical repair of the torn rotator cuff helps in relieving the pressure on the rotator cuff tendon and from symptoms, however tendon-to-bone healing after rotator cuff surgery still has a large failure rate. Hyperlipidemia has been strongly associated with RCI although the cellular and molecular mechanisms are largely unknown. The focus of this study is to critically evaluate and further explore the role of emerging therapies in RCI and rotator cuff tissue repairs, discover new molecular therapeutic targets for RCI, and determine their implication as a risk factor for tears, repair, and retears.

Methods Used: Electronic searches were conducted on multiple databases including 107 selected references. The results from various studies were critically reviewed to discern the best therapies for RCI and identify new potential targets for repair. Pertinent subject categories included bone health, metabolic syndrome, rotator cuff surgery, and non-surgical treatment. Within these categories, vitamin D deficiency, arthroscopic repair, biological augmentation, statins, RICE, peroxiredoxin 5, and microRNAs were characterized for their use in the treatment of RCI.

Summary of Results: Hyperlipidemia was found to have a large impact on full-length tears by inducing LDL entrapment within the dense regular collagen of rotator cuff muscles resulting in foam cell aggregation and macrophage recruitment causing tendon inflammation. Subsequent inflammatory pathways including the JAK2/STAT3 pathway and NLRP3 inflammasome pathway led to persistent inflammation and extracellular matrix (ECM) degradation within the rotator cuff. While arthroscopic repair remains the most common treatment modality, nonsurgical treatment including statins, vitamin D, and targeting miRNA are also of therapeutic benefit. Notably, Peroxiredoxin 5, a mitochondrial protein, has been found to protect human tendon cells from loss of function during oxidative stress. Overall, hyperlipidemia is a major risk factor for RCI as it interferes with arthroscopic repairs by inducing inflammation and stiffness within tendons and increases the risk of retears.

Conclusions: Overall, the literature at present adequately elucidates the rising rates of RCI and the emerging treatment modalities available for patients. Most notably, targeting underlying mechanisms influencing inflammation has large therapeutic value as a novel treatment strategy for the management of rotator cuff pathology. RCI rates continue to rise, therefore there is a need for research on specific molecular mechanisms that can be targeted for improved prognosis. Investigating novel therapeutic targets attenuating hyperlipidemia-induced inflammation will be of significance.

 # 329

MITOCHONDRIAL BIOGENESIS REGULATES NEOINTIMAL FORMATION AND VESSEL REMODELING DURING ARTERIOVENOUS FISTULA MATURATION

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Purpose of Study: Chronic kidney disease (CKD) is a condition in which a patient's kidney function declines over time. During the last stages of CKD, patients will need to have a kidney transplant or be placed on hemodialysis. Due to the lack of organ availability many patients are placed on hemodialysis. This therapeutic approach would be impossible without special vascular access. Among these vascular access methods, arteriovenous fistula (AVF) is the preferred method because AVFs have lower rates of thrombosis and infection and provide longer survival of access. Although AVF is the preferred method of vascular access for hemodialysis, they still have a high prevalence of failure due to thrombosis and outflow vein stenosis. The ever-increasing need for AVFs in patients with CKD warrants a better understanding of the molecular mechanism involved in the maturation failure of AV Fistula. Hypoxia due to disrupted vasa vasorum during AVF creation precipitate oxidative stress and this study aims to investigate the role of mitochondrial biogenesis in AVF maturation.

Methods Used: This study used the already collected vascular tissues (control and experimental) from AVF of Yucatan microswine. Hematoxylin and eosin (H&E) staining along with pentachrome staining were performed on the collected tissue. Immunohistochemistry was performed against inducible nitric oxide synthase (iNOS), proliferator-activated receptor gamma coactivator 1-α (PGC1-α), and nuclear respiratory factor 2 (NRF2). The stained slides were imaged with a Leica DM6 microscope at a scale of 100 µm. All the scanned images were anonymously reviewed by two independent observers. The high magnification images from each tissue section were manually analyzed for average stained intensity and average stained area using Fiji Image J.

Summary of Results: H&E and pentachrome stains of AVF junctions revealed vascular thrombosis and stenosis of the AVF vessels and fibrosis of the adjoining tissues in the control group compared to the treatment group. The preliminary results of immunostaining of the control and experimental group tissues showed increased expression for iNOS while decreased expression for PGC-1α and NFR-2 in the control compared to the experimental group.

Conclusions: The results of this study showed that proteins involved in mitochondrial biogenesis, such as PGC1-α and NRF2, are increased during AVF creation and attenuating inflammation with TLR-4 and TREM-1 inhibition has beneficial results by attenuating inflammation, fibrosis, and thrombosis. However, there is a need for further research on effective therapeutic agents to target multifactorial pathologies to promote the maturation of AVF.

 # 340

CONTRACEPTIVE BELIEFS, NEEDS, AND PRACTICES OF SIKH WOMEN IN SOUTHERN CALIFORNIA

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Purpose of Study: The primary purpose of this qualitative study was to explore the contraceptive beliefs and practices of Sikh women in Southern California.
Methods Used: Permission to conduct this research on an exempt basis was obtained from the Human Subjects Committee at Western University and from the Gurdwara Committees at 3 religious sites. A 23 question survey was developed and beta tested. Subjects were non-pregnant Sikh women age $\geq$ 18 who responded to a personal invitation. Study participants showed support after a group invitation conducted on a platform usually catered to male leadership associated with the religious institutions. Eligible potential subjects were told that participation was voluntary and anonymous. Only data about nonidentifying demographic information, about prior contraceptive use and beliefs about what methods were collected along with answers to questions about attitudes towards menstruation and the medical care system.
Summary of Results: The interview response rate was 78%; 84 Sikh women aged 18 to 55 years and older were interviewed. Most were Indian born (85%), married (74.6%), and Sehajdhari Sikhs, who were not initiated and fully conformed to the religion (56.5%). Half (50.5%) reported household income $\geq$ $50,000, but 32.9% did not know their family income. Nearly half (48.6%) believed that Sikhism does not permit contraceptive use. The most commonly listed method was breastfeeding (40.5%), followed by condoms (22.9%); 29.7% said they engage in sexual relations primarily to reproduce. Most (57.8%) did not know about menstruation before menarche, 57.8% preferred a female Sikh caregiver or at least a South Asian one.
Conclusions: While all women deserve counseling about all contraceptive methods, clinicians should be aware that the majority of Sikhs, especially those who have migrated from India, do not believe in or need birth control. There needs to be awareness in the healthcare field about the lack of education that exists around menstruation in the Sikh community, reflecting on cultural attitudes and traditions. Further expansion of the study to groups of women across all age groups, especially younger women, in larger numbers will allow for better exploration of Sikh women's contraceptive beliefs and practices.

 # 366

3-AMINOIMIDAZO[1,2-A] PYRIDINE DERIVATIVES AS NOVEL ANTIMICROBIAL COMPOUNDS

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Purpose of Study: Data from the Global Research on Antimicrobial Resistance (GRAM) report showed that in 2019, an estimated 4.95 million deaths were associated with bacterial antimicrobial resistance. Identifying novel compounds with antimicrobial properties is vital to reduce mortality worldwide. A 2011 cancer drug screening study identified two compounds with minor inhibition of human topoisomerase II. Three related 3-aminoimidazo[1,2-A] pyridine derivatives (DAV33, DAV32, and DAV07), synthesized using the Grobeke-Blackburn-Bienayme reaction, were found to exhibit moderate antimicrobial activity against Staphylococcus aureus. We quantified antimicrobial properties for each compound and hypothesized that bacterial gyrases are the cellular target for their mechanism of action.
Methods Used: To determine the antimicrobial spectrum, we utilized Kirby-Bauer disk diffusion assay for each compound against eight strains of bacteria, according to Clinical Laboratory Standard Institute (CLSI) guidelines. We assayed clinical isolates of gram-positive pathogens Streptococcus pyogenes, Streptococcus agalactiae, Enterococcus faecalis, Listeria monocytogenes, Bacillus anthracis, and of gram-negative pathogen Salmonella enterica.
To quantify the minimal inhibitory concentration and minimal bactericidal concentration of the compounds we utilized serial dilution assay, according to CSLI guidelines.
To determine if bacterial gyrase is the cellular target for these compounds, S. aureus and Escherichia coli gyrase DNA supercoiling assay were used per manufacturers guidelines.
Summary of Results: DAV32 proved to be the most potent novel antimicrobial with specificity towards gram-positive organisms. DAV33 and DAV07 exhibited moderate and minor activity in the Kirby-Bauer assays, respectively. DAV32 proved to be bactericidal against B. subtilis, S. aureus, S. agalactiae, S. pyogenes, and B. anthracis. DAV33 and DAV07 were not bactericidal against any isolate. The DNA gyrase assays for E. coli and S. aureus revealed no dose-dependent inhibition and very minor dose-dependent inhibition, respectively.
Conclusions: DAV32 is a promising hit compound and can serve as a scaffold for further development of novel antibacterial compounds against a broad spectrum of gram-positive pathogens. The hypothesis that our antimicrobial compounds specifically target DNA gyrase proved incorrect. Thus, the cellular target, leading to cell death, has not yet been identified. DNA-gyrases share an ATP-binding domain fold with various classes of other proteins. We thus suspect that some of these other proteins, perhaps histidine kinases, are targeted and should be investigated further.

 # 369

COMPARITIVE GENE EXPRESSION OF SUSCEPTIBLE AND RESISTANT VECTORS OF THE HUMAN PATHOGEN, *SCHISTOSOMA MANSONI*

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Purpose of Study: Schistosomiasis is a neglected tropical disease infecting more than 200 million people in the tropics and sub-tropics. Human intestinal schistosomiasis in Africa and South America is caused by a parasitic flatworm, *Schistosoma mansoni,* which is transmitted by a vector snail host in the genus *Biomphalaria*. Previous research has identified snail genes involved in the resistance of a South American snail vector, *B. glabrata* to the parasite, *S. mansoni.* However, virtually nothing is known about the mechanisms by which African species of *Biomphalaria* resist infections to this parasite, even though 90% of human transmission occurs in Africa. With the goal of understanding mechanisms of resistance of African vectors to schistosome infection, we measured three candidate immune genes in *B. sudanica* after challenging them with lines of parasites to which they are resistant (NMRI), susceptible (UNMK), or a sham exposure. These genes include: toll-like receptor (TLR), fibrinogen related protein 2 (FREP2), and granulin (GRN).

Methods Used: *B. sudanica* snails were exposed to larvae of either line of parasite. Sham exposure was used as a control. RNA extraction was performed on 100 snails. Gene expression and mRNA levels of TLR, FREP2, GRN, and Actin (housekeeping gene) were measured at 8, 24, or 72 hours post exposure using RT-qPCR. Delta CT (ΔCT) values (relative gene expression compared to Actin) were determined for each candidate immune locus. Nonparametric Wilcoxon tests were performed to determine significant differences (when $P<0.05$) in ΔCT between exposure groups and timepoints.

Summary of Results: Expression of GRN in resistant (median ΔCT=8.06) and susceptible snails (median ΔCT=7.21) was significantly lower than in sham-exposed snails at 8 hours (median ΔCT=6.72). At 72 hours, GRN expression was significantly increased in susceptible snails (median ΔCT=6.54) compared to control (median ΔCT = 10.32) and resistant snails (median ΔCT = 6.89). TLR expression was significantly lower for sham-exposed (median ΔCT=12.57) and resistant snails (median ΔCT=11.19) compared to susceptible snails (median ΔCT = 10.31) at 72 hours. The FREP2 gene was excluded from further analysis as it showed an unusual binomial expression at the 24-hour time point, suggesting that the primers targeted paralogous gene transcripts.

Conclusions: Comparatively higher TLR/GRN expression in susceptible snails rather than resistant/control snails 72 hours post exposure suggests these two genes do not play a role in conferring resistance to *S. mansoni* infection but are potentially triggered following recognition of the UNMK parasite. Future studies investigating TLR/GRN expression at other timepoints post exposure to *S. mansoni* may demonstrate the importance of these genes in *B. sudanica* resistance.

 # 391

ONCOSTATIN-M-PLASMINOGEN ACTIVATOR INHIBITOR-1 PROPOSED EFFECTS ON ARTERIOVENOUS FISTULA MATURATION: A LITERATURE REVIEW

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Purpose of Study: End stage renal disease is a crippling diagnosis that requires dialysis as treatment. Typical surgery associated with dialysis is an arteriovenous fistula (AVF) with maturation signifying successful dialysis to allow for filtration of the patient's blood. However, failure to mature and closure of the AVF require creation of another fistula site, and markedly increased morbidity/mortality. Current literature involving molecular mechanisms associated with AVF failure supports the role of inflammatory mediators involving immune cells and inflammatory cytokines. However, the role of oncostatin M (OSM), an IL-6-like inflammatory cytokine, and its downstream targets are not well investigated. Here, we reviewed existing literature on the role of OSM in vascular inflammation, thrombosis, and stenosis, the most common causes for early AVF failure with potential use of OSM as a therapeutic target.
Methods Used: Electronic search (2000 – 2022) was conducted on multiple databases which involved identification of 111 research articles. The results from these studies were critically reviewed to compare the relationship between OSM signaling and its effects on AVF maturation failure. Pertinent keywords, alone or in combination, included CKD, AVF surgery, early thrombosis, stenosis, maturation failure, and tissue injury/repair. Within these categories, oncostatin M, plasminogen activator inhibitor-1 (PAI-1), and hypoxia inducible factor-1a (HIF-1a) were characterized for their effects on AVF maturation, and possible therapeutic targets to prevent maturation failure.
Summary of Results: OSM and its downstream mediators, such as HIF-1a and PAI-1, mediate various pathways of inflammation, oxidative stress, thrombosis, and stenosis. Via inflammation, OSM has been shown to cause ECM deposition in smooth muscle cells. Additionally, through immune cell infiltration and increased oxidative stress HIF-1a is a key mediator in plaque formation in arterial walls. Finally, PAI-1 has been implicated in inducing fibrosis within various tissues, including lung and skin.
Conclusions: Overall, literature surrounding OSM and inflammation has been well-characterized in various tissues including thrombosis and plaque formation. However, the role of OSM-mediated activation of PAI-1 mediating early thrombosis, stenosis, and AVF maturation failure is unknown. This review is of clinical significance as it shows the cross play between OSM and its downstream mediators, whose profibrotic and pro-stenotic effects are common causes of AVF maturation failure. In addition, our preliminary data with findings of significantly increased expression of OSM, PAI-1, and HIF-1a in AVF tissues with early thrombosis indicate a critical role of these mediators in AVF maturation failure. Thus, investigation of therapeutic targets to attenuate AVF maturation failure through the OSM-HIF-1a-PAI-1 pathway is of clinical significance.

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 # 397

RISK OF RETINAL VASCULAR OCCLUSION AMONG PATIENTS WITH COVID-19 AND INFLUENZA A: A MULTI-CENTERED ANALYSIS

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Purpose of Study: Severe COVID-19 infection has been associated with a hypercoagulable state, contributing to the formation of clots. Retinal vascular occlusion (RVO) is a common cause of vision impairment and is due to blockage of the retinal arteries and veins. There have been reported cases of patients with previous history of COVID-19 presenting with new RVO. Given the minimal research delving into this relationship, the purpose of this study was to investigate the short-term prevalence and risk for RVO following infection by COVID-19 compared to Influenza A.
Methods Used: Two cohorts were created using TrinetX, a national federated electronic health record (EHR). The two cohorts consisted of patients with a history of COVID-19 (n=2,352,475) and patients with a history of Influenza A (n=67,065). Both cohorts were balanced using 1:1 propensity score matching (PSM) addressing demographics and medical comorbidities. Outcomes between the two cohorts were compared using adjusted risk ratios (aRR), with a confidence interval of 95%.
Summary of Results: After PSM, two cohorts of 67,063 patients each were compared. Patients in the COVID-19 cohort had an average age of 41.4+/-23.0 years compared to 34.4+/-27.7 years in the Influenza cohort. Between the two cohorts, there was no significant difference in risk of developing retinal vascular occlusion (aRR [95% CI] = 0.72 [0.49,1.06]; p=0.097) and patients with COVID-19 had a significantly lower risk for developing retinal vein occlusion (aRR [95% CI] = 0.45 [0.27,0.77]; p=0.03). Incidence of retinal vascular occlusion was 0.1% between both cohorts. Retinal artery occlusion was excluded from analysis due to obfuscation of the data by the EHR.
Conclusions: Between the two cohorts, there was no significant difference in risk for developing RVO within 120 days. However, while there was no significant difference, vascular occlusions were found at a relatively younger age than the general population. Although incidence of RVO was low between the two cohorts, both viruses could be considered a risk factor for development of RVO, particularly in younger patients lacking classic risk factors for the disease.

 # 399

CHANGES IN nREM SLEEP DURATION FOLLOWING THALAMIC LOW INTENSITY FOCUSED ULTRASOUND PULSATION: PRELIMINARY DATA

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Purpose of Study: When patients survive a severe brain injury but fail to recover, they often enter a disorder of consciousness (i.e., vegetative state – VS – or minimally conscious state – MCS). There are currently no approved therapeutics to bolster further recovery once these conditions become chronic, but thalamic low intensity focused ultrasound pulsation (tLIFUP) has recently been investigated as a novel, non-invasive neuromodulation approach. non-REM (nREM) sleep elements such as K-complexes and sleep spindles have generators in the thalamus and their presence has previously indicated better outcomes for patients with disorders of consciousness. We assessed whether a low intensity focused ultrasound pulsation to the thalamus could increase nREM sleep in patients and whether changes in the amount of nREM sleep could relate to behavioral improvement.
Methods Used: The sleep patterns of nine patients classified as being in a minimally conscious state or a vegetative state based on the Coma Recovery Scale-Revised (CRS-R) were analyzed. Participants' ages ranged from 21 to 69 years; etiologies mostly included traumatic brain injuries (n = 5); and time since injury ranged from two to seven years. Nocturnal polysomnography (PSG) was recorded and automatically scored using the Dreem2 headband based on frontal (Fp1, F7, F8) and occipital (O1, O2) electrodes. Percentage of sleep spent in nREM the night before tLIFUP vs. the percentage of sleep spent in nREM prior to discharge were compared using a paired t-test. The changes in nREM percentage were also correlated to changes in CRS-R scores after LIFUP.
Summary of Results: A significant increase (on average 22.3%) was observed in the amount of nREM sleep following thalamic low intensity focused ultrasound pulsation (*r=0.75; p=0*.02). All participants showed increased CRS-R scores following tLIFUP; however, the Spearman correlation between changes in nREM sleep and CRS-R scores was not significant (*r*=0.20; p=0.59). Factors such as age, etiology, and time since injury did not significantly affect the percent change in nREM sleep.
Conclusions: Treatment approaches for patients experiencing disorders of consciousness remain limited; however, it has been postulated that patients who are minimally conscious or in a vegetative state have better outcomes if they experience nREM sleep. These preliminary data suggest that thalamic low intensity focused ultrasound pulsation could promote nREM sleep and thus may have therapeutic considerations for individuals with disorders of consciousness.

Joint Plenary Session
WAFMR, WAP, WSCI, AND WSPR

Friday, January 20, 2023
1:45 PM – 4:30 PM

 # 415

THE IMPACT OF COVID-19 PANDEMIC ON AFFECTIVE CONCUSSION SYMPTOMS IN ADOLESCENTS
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Purpose of Study: Affective symptoms, such as depression, nervousness, anxiety, and irritability, are common yet complicating aspects for concussion patients, therefore addressing exasperations of these symptoms is essential for injury management. This is an especially important consideration for patient populations increasingly susceptible to affective disorders, such as those in rural regions and adolescents. Increases in adolescent mental health problems during the time of the COVID-19 pandemic pose an additional challenge for clinicians managing affective concussion symptoms in rural adolescents. The aim of this study is to quantify the mental health effects of the pandemic by comparing affective concussion symptoms in groups of adolescents with concussion and without concussion in the Central Oregon region.
Methods Used: The study is a secondary data analysis of ImPACT Concussion Test symptom scores from a cohort of non-concussed (Baseline) and concussed (Post-Injury) adolescents between the ages of 12-18, pre-pandemic (January 1, 2015 - March 20, 2020) and pandemic (March 21, 2020 - April 1, 2022). Subjects were excluded from the study if they received special education, had a diagnosis of learning disabilities, ADD, dyslexia, autism, or received treatment for headaches, migraines, epilepsy, brain surgery, meningitis, substance use or psychiatric conditions. Prevalence of symptoms of 'headache', 'trouble falling asleep', 'irritability', 'nervousness', 'sadness', and 'feeling more emotional' were noted for each group during each time period.
Summary of Results: A total of pre-pandemic non-concussed (n =2667), pre-pandemic concussed (n=643), pandemic non-concussed (n = 593) and pandemic concussed (n=87) were included in the final analysis. There was a statistically significant increase in the proportions of 'nervousness' (p=0.0209) and 'sadness' (p=0.0117) in pre-pandemic and pandemic non-concussed groups. Furthermore, there were statistically significant increases in the proportions of 'headache' (p=0.0331), 'irritability' (p=0.0006), 'nervousness' (p=0.0135), 'sadness' (p=0.0357) and 'feeling more emotional' (p=0.0039) between pre-pandemic and pandemic concussed adolescents.
Conclusions: This study demonstrates a significant increase in affective symptoms in both concussed and non-concussed groups during the COVID-19 pandemic consistent with other studies. However, those with concussion during the COVID-19 pandemic showed greater number of affective symptoms as well as somatic symptoms (headache) compared to concussed pre-pandemic adolescents. The results of this study support the broader body of research examining the mental health burden of the COVID-19 pandemic on adolescents, and further encourages a biopsychosocial approach to injury management, in which social and emotional components of a patient's life are considered.

 # 428

THE IMPACT OF HOMELESSNESS ON MANAGEMENT OF MENSTRUATION AND DYSMENORRHEA IN POMONA, CA

Ahuja GK, Holtzman S, Fuchs S, Nelson AL. Western University of Health Sciences, Pomona, CA

Purpose of Study: The purpose of the study was to determine the barriers to menstrual health and dysmenorrhea management for homeless women in Pomona, CA. The current literature surrounding these issues reflects very few of the specific challenges homeless women face. Given the challenges to menstrual hygiene most women endure, and the high rate of homelessness in Pomona, we suspected women without stable housing would have increased difficulty managing their menstrual hygiene and dysmenorrhea due to lack of resource accessibility.

Methods Used: We developed and beta tested a 21-question survey, divided into sections about demographics, history of homelessness, menstrual health, and dysmenorrhea. We pre-arranged times with local homeless shelters and a student-run clinic to screen for eligible participants and give voluntary and anonymous in-person surveys. All results were inputted into Qualtrics and further analyzed.

Summary of Results: Two of the 10 shelters contacted participated in this project. Participants were also recruited from a student-run clinic. Overall, 30 surveys were completed (96% response rate from 31 women contacted). The average age of participants was 36 years old, with a range from 19 to 52 years old and 37% identified as Hispanic and 33% as Caucasian. We found that there was a large range in terms of reported time spent homeless (2 weeks to 7 years).

The preferred method of menstruation care was tampons (43%) versus the more often used method when without housing was pads (64%). When asked where they get their menstrual products when without housing, the most common response (37%) was that they obtain them from the shelter pantry. Further, 27 % of the participants admit to stealing products when they needed them. Participants reported the top-most common adverse effect of menstruation was painful cramping (86%). When participants were without stable housing, however, the most common response for how they managed their pain was to just deal with it (60%) or find time to rest (23%).

Conclusions: The results of this study help bridge the gap in the existing literature regarding the specific struggles that women facing housing insecurity experience when managing their menstrual hygiene and dysmenorrhea. Specifically, we found there was a discrepancy in terms of preferred products to collect menstrual blood versus what participants ended up actually using when without housing. We also found a discrepancy in the preferred use of medication for the management of painful cramping, and what they end up having to do which is just deal with their pain. These differences largely come down to a lack of access to preferred resources. We recognize that the study could benefit from a higher participant number to better reflect the needs of this population.

 # 429

THE IMPACT OF STRUCTURAL HEALTH INEQUITIES ON THE AAP'S 2022 POLICY: BREASTFEEDING AND THE USE OF HUMAN MILK

Saleem S, Burger K. Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, Pomona, CA

Purpose of Study: Breastfeeding improves short-term health outcomes and provides long-term protection against chronic diseases in both infants and their mothers. In premature infants, it decreases the incidence of chronic lung disease, necrotizing enterocolitis, and sepsis. In term babies, breastfeeding is associated with a lower incidence of gastroenteritis, asthma, infections, and sudden infant death syndrome. In adulthood, the positive implications are a higher IQ, better eyesight, and a decreased incidence of leukemia, obesity, and diabetes. Advantages to breastfeeding mothers are increased oxytocin, decreased postpartum depression, and improved weight loss. They also experience reduced incidence of osteoporosis, heart disease, T2DM, and reproductive cancers. This translates into cost savings and a lower fiscal burden on the U.S. healthcare system. However, the purpose of this study is to address how past and current U.S. policies regarding parental leave are hindering this economic progress. We will also investigate how structural determinants of health block adherence to both the 2012 and 2022 guidelines set by the American Academy of Pediatrics (AAP) regarding breastfeeding and the use of human milk. The new 2022 policy extends the recommended breastfeeding duration to at least two years with six months of exclusive breastfeeding.
Methods Used: Systematic review of twelve research studies that investigated maternity leave length with sociodemographic factors, breastfeeding duration, and health outcomes in mothers and infants. Health outcomes were correlated to healthcare spending.
Summary of Results: More than half of new mothers stop exclusively breastfeeding by three months, which coincides with the typical length of maternity leave in the United States. Maternity leave length and breastfeeding rates are influenced by sociodemographic factors (race, occupation, education level, age, marital status). Countries with paid parental leave of at least six months have longer breastfeeding duration, better health outcomes, and lower healthcare costs.
Conclusions: The only federal guarantee of job protection for growing families is 12 weeks of unpaid leave for about half of the U.S. workforce. The lack of widespread coverage solidifies health inequities. The children most at risk of not being breastfed, being born preterm or low birth weight, or dying in the first years of life, are those whose parents cannot take time off work. The U.S. spends the most on healthcare worldwide but has the lowest life expectancy and the highest rate of chronic disease, suicide, hospitalizations from preventable causes, and avoidable deaths compared to 10 other high-income nations. Therefore, while the 2022 AAP guidelines are a step in the right direction, the most pressing need is for policy changes that provide paid parental leave and paid lactation breaks. By shifting our focus to address these structural issues, we will alleviate disparities and provide more reasonable expectations for mothers in achieving the new guidelines.

 # 432

COMPARISON OF OCCUPATIONAL THERAPY AND OSTEOPATHIC MANIPULATIVE TREATMENT IN NEONATAL INTENSIVE CARE UNITS

Saleem S[1], Burger K[1], Takata B[2], Zufall B[1], Oosterbaan C[1]. [1]Western University of Health Sciences, College of Osteopathic Medicine of the Pacific, Pomona, CA and [2]Emanate Health Queen of the Valley Hospital, West Covina, CA

Purpose of Study: Premature babies, due to their smaller size and low birthweight (less than 5 lbs), experience difficulties with latching and oral feeding, hypothermia, respiratory distress, and infection. For these reasons, a low birth weight contributes to 60 to 80% of all neonatal deaths. The purpose of this study is to demonstrate how Occupational Therapy (OT) and Osteopathic Manipulative Treatment (OMT) improve breast or bottle feeding, promote weight gain, reduce reflux and jaundice, regulate body temperature, achieve developmental milestones, correct plagiocephaly, and reduce the length of stay in the NICU. According to guidelines set by the American Academy of Pediatrics, the three major physiologic criteria for hospital discharge of preterm infants are autonomous oral feeding that results in proper weight gain, maintenance of appropriate body temperature in a home environment, and mature respiratory control for sufficient oxygenation. Thus, these clinical indicators help assess the effectiveness OT and OMT in achieving these criteria and supporting the development of preterm infants.

Methods Used: Systematic Review of six research studies that compare seven treatment outcomes of OT to OMT in the NICU. The OT treatment modalities (standard of care) are neonatal massage, myofascial release (MFR), neurodevelopmental treatment (NDT), skin-to-skin (kangaroo care), and caregiver education. The OMT treatment modalities (adjuvant care) are soft tissue, MFR, balanced ligamentous tension, paraspinal inhibition, v-spread, condylar decompression.

Summary of Results: Both OT and OMT techniques decreased hospital length of stay by improving oral feeding and promoting weight gain (95% CI -3.99, -1.43; $P < 0.001$). However, OMT also achieved better results in the seven treatment outcomes. The treatments were for hyperbilirubinemia, ileus of prematurity, congenital or acquired torticollis, nonsynostotic occipital plagiocephaly, delayed motor development, gastroesophageal reflux, and nipple latching.

Conclusions: While many techniques of OT and OMT are similar, the main differences are that OT places a larger emphasis on social components of parental education and bonding as part of the therapeutic approach. OMT relies more on the physical technique to address somatic dysfunction and restore health. There is a growing emphasis to incorporate OMT as adjuvant therapy into the standard of care for the NICU. Osteopathic physicians who perform OMT should work in coordination with different specialists, such as lactation consultants and physical therapists, to improve biomechanical sucking difficulties and positional plagiocephaly. These techniques demonstrate numerous benefits that cultivate in shorter NICU stays for newborns, however, they are still underutilized in most settings. Moving forward, steps need to be taken to encourage these treatment modalities in the NICU and in all newborn physical exams when indicated. They are quick, noninvasive methods that are proven to prevent, treat, and improve outcomes for patients.

 # 500

TIKTOK, IT'S THAT TIME OF MONTH: A QUALITATIVE EVALUATION OF TIKTOK AS A SOURCE OF INFORMATION ON MENSTRUATION

Nguyen N, Haddadin CM, Nelson AL. Western University of Health Sciences, Pomona, CA

Purpose of Study: With increasing popularity, TikTok has become a major social media platform for creators to share videos publicly. Many have used TikTok to discuss menstruation and share relatable experiences but previous research has not explored these conversations. This study analyzes these videos to inform clinicians of what content creators are telling viewers about menstruation.
Methods Used: The TikTok algorithm displays videos in order of popularity; videos with the most engagement (likes, views, comments) show up first on the feed. When searching TikTok, we utilized the keywords "menstruation" and "period" to find videos in the timeframe Sep 2016-Jul 2022 and applied our inclusion criteria (≥ 10K views, ≥ 2K likes, ≥ 25 comments, and ≥ 10 shares) to define our study population. Each video and its respective comments were analyzed for all informational themes until thematic saturation was reached under each keyword (5 videos in a row without new themes; 3 comments in a row without new themes).
Summary of Results: Our search yielded 212 videos and 2359 comments of which 175 videos and 2019 comments met criteria for analysis. In total, we collected 111 menstrual themes that were generalized into 10 categories. Analysis of these categories revealed 5 prominent themes including menstrual miseries, period stigma, eco-friendly menstruation, period product tutorial/discussion, and menstrual education. Notable quotes related to menstrual misery include "It's just not fair, I have to do this once a month for the next thirty years??!" and "When you fart on your period, it's like a freaking blood rocket going off in your pants." Prominent comment themes were shared experiences, support, and opinions which included representative quotes like "Bro when I got my first one I thought I pooped myself", "I'm so glad I switched to reusable pads, they're amazing in every way", and "the revenge of the uterus."
Conclusions: "Aunt Flo", "time of month", "shark week"–the universal secret codes for having a period. TikTok shows for many, especially youth, period stigma such as this is still a daily struggle and gaps in menstrual education still persist. This study revealed that menstruators are still suffering and would like more information on plastic free, fully biodegradable, and sustainable products as well as managing menstruation and dealing with period stigma, which are all issues their clinicians can address.

 # 501

HOME VS. HOSPITAL BIRTH: PATIENT PERCEPTIONS, ATTITUDES, AND ADVICE EXPRESSED ON REDDIT

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Purpose of Study: During the COVID-19 pandemic, the number of home births increased due to a rising perception of danger at hospitals. Social media is a way to share stories and experiences on topics including birth, and it has become a main means by which people gather information, regardless of whether it is accurate or not. While reasons for choosing home birth have been studied before, gathering this information from social media, especially considering the recent pandemic, has not yet been done. Reddit is a social media platform that includes 52 million daily users that post publicly and anonymously, thus sharing unfiltered information for anyone to see. Through a review of public posts and comments on Reddit from January 2017 through July 2022, using guidelines from previous studies, major themes on perceptions, attitudes, and advice people have about home birth were gathered.
Methods Used: Search words on Reddit included "home birth", "home vs. hospital birth", "home birth and covid", "home birth and birth trauma", and "home birth and trans men". There were up to five themes per post or comment. These themes were categorized as positive (in support of home birth), negative (against home birth), or neutral. Posts had to be from the US, in English, with at least 10 comments and 10 upvotes, and from the last five years. Posts were excluded if they did not meet minimum comments and/or upvotes requirement, were explicitly from another country, were not directly related to home birth, it was not a planned home birth, it was a free birth, or they were from more than five years ago.
Summary of Results: A total of 425 posts and 13,013 comments were reviewed for all search words. Out of 142 posts included, 68% were in support, 21% were against, and 11% were neutral. There were 1,384 comments included. Specific communities ("subreddits") were also searched and 36% of posts came from "r/homebirth". Supportive themes included concerns about safety in hospital delivery and reassurance about home birth safety, patient control with home deliveries, and advice about preparing for home birth. Negative themes included concerns about the risk of home birth, charges of negligence for those attempting it, reassurance that hospital birth offers women more control, and that medical interventions can be lifesaving.
Conclusions: The results of this study will be used to help physicians recognize what women worry about hospital birth and what (mis)information they may have about home birth to better advise patients about their delivery options. This gives a voice to patients and their concerns regarding birth, which can help bridge gaps in physician-patient communication.

Hematology and Oncology III
Concurrent Session

10:15 AM
Saturday, January 21, 2023

 # 502

THE ROLE OF LIPOCALIN-2 IN TRIPLE NEGATIVE BREAST CANCER SPHEROID/ORGANOID PROGRESSION AND INVASION.

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Purpose of Study: Breast cancer (BC) is among one of the most common cancers in the world. BC cells can be classified into subtypes based on the presence of the receptors for estrogen, progesterone, and epidermal growth factor. These receptors are the target for many therapeutic strategies. Such approaches have been proven to be ineffective against the subtypes of BC that are negative for any of the receptors, especially the triple negative breast cancer (TNBC) subtype. Thus, the TNBC subtype has been found to be difficult to treat and has a higher mortality rate. Recent transcriptome analysis of our metastatic TNBC cell line, Py230, revealed that lipocalin-2 (Lcn2) axis is selectively expressed and associated with poor prognosis. Lcn2 has been shown to be involved in sequestration of iron-containing siderophores and its expression is a biomarker for diseased states across various organs. We sought to further study Lcn2 roles in metastatic TNBC, hypothesizing that TNBC-derived Lcn2 mediates invasion and premetastatic lung reprogramming to support metastasis.
Methods Used: TNBC derived organoids/spheroids have been used to mimic the 3D behavior/microenvironment of TNBC tumors. Interfering RNA technology was used to control the level of expression of Lcn2 which led us to engineer shScramble (normal expression) and shLcn2 (low expression) derivatives. The size and shape of the spheroids and organoids were analyzed and correlation with the level of expression of Lcn2 in different culturing media conditions was measured.
Summary of Results: Our findings suggest that Lcn2 knockdown (KD) blocks organoid invasion/protrusion and inter-organoid bridging in TNBC cells. This effect cannot be rescued via the addition of exogenous recombinant Lcn2 protein to Lcn2 KD cells. Moreover, exogenous blockade of Lcn2 in shScramble cells does not reduce the invasion phenotype. More interestingly, removal of certain media additives such as Fibroblast Growth Factor 2 (FGF2) drastically reduces organoid invasion. In fact, FGF2 treatment is sufficient to produce invasion/protrusion in Py230 shScramble cells. Lastly, Lcn2 KD enhances compactness (ratio of the volume and the surface area) in TNBC spheroids.
Conclusions: Lcn2 has been shown to have roles in cancer progression and metastasis. Our results suggest that exogenous pool of Lcn2 is not the pool of Lcn2 that gives rise to the observed invasion/protrusion phenotype in TNBC organoids. Moreover, addition of certain exogenous factors such as FGF2 affects the behavior of shScramble organoids. This suggests that the invasion phenotype of TNBC cells can be rescued by the addition of soluble exogenous factors whereas exogenous Lcn2 does not reproduce the effects. We speculate the potential off-target effect of shRNA or upregulation of FGF2 receptor by endogenous Lcn2 to be responsible for the observed phenotype in TNBC cells. These results establish the role of Lcn2 in TNBC tumor morphology which could be a promising therapeutic target for blocking BC progression, invasion, and metastasis.

 # 511

TRANSCRIPTIONAL PROFILING OF GERMLINE-ENCODED, MYCOLYL-REACTIVE CELLS IN PREVIOUSLY MYCOBACTERIUM TUBERCULOSIS-EXPOSED PERUVIANS

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Purpose of Study: Germline-encoded mycolyl-reactive (GEM) cells are T cells that recognize lipid antigens, such as glucose monomycolate (GMM) from Mycobacterium tuberculosis (Mtb), presented by CD1b and are exclusively detected in individuals exposed to Mtb. Unlike classical antigen presenting molecules, major histocompatibility complexes (MHC), CD1b is non-polymorphic. When discovered in 2013, GEM cells were defined as GMM-loaded CD1b-tetramer-binding cells which express the T Cell Receptor Alpha Variable 1-2 (TRAV1-2). Previous studies have defined an "innateness" gradient of T cells based on their transcriptional profiles, from CD4 cells as most adaptive to natural killer (NK) cells as the most innate reference population. In this study, we aimed to determine where in the "innateness" gradient GEM cells lie and identify their function by transcriptional profiling.
Methods Used: We performed bulk RNA-sequencing analysis on sorted NK and T cells from 13 participants with history of TB exposure from Lima, Peru. Peripheral blood mononuclear cells (PBMC) were sorted via fluorescence-activated cell sorting to sort NK cells, mucosal-associated invariant T (MAIT) cells, invariant natural killer T (iNKT) cells, Vd1 cells, Vd2 cells, CD4 cells, CD8 cells, and GEM cells. Each sample was bulk RNA-sequenced at the Broad Institute. Raw reads were trimmed using Trimmomatic, quality controlled using FastQC, replicates merged, and reads mapped and quantified using Kallisto on UCSF Wynton High Performance Cluster. Data analysis was done using DESeq2 in R to produce principal component analyses and volcano plots to discover differentially expressed genes.
Summary of Results: Our results show specific transcriptional profiles for GEM T cells with differentially expressed genes compared to other T and NK cells. Our results suggest GEM cells are more transcriptionally similar to "adaptive" CD4 T cells. Our cohort of Peruvian samples show more innate-like CD8 T cells compared to CD8 T cells of healthy Boston samples.
Conclusions: As GEM cells are invariant, we hypothesized that GEM cells would resemble other innate T cells such as MAIT cells and iNKT cells. Surprisingly, our findings show that GEM cells are more transcriptionally similar to "adaptive" CD4 T cells than other innate-like T cells. We also identify differentially expressed genes in GEM cells compared to other innate and classical T cells, which can be used in next steps for pathway analysis to identify transcriptional pathways that may be upregulated in GEM cells. Understanding the functions of these GEM cells may facilitate the development of lipid-specific TB vaccine candidates.

 # 533

ASSESSING MEDICAL AND PHYSICAL THERAPY STUDENTS' COMPETENCIES IN CONCUSSION MANAGEMENT PROTOCOL

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Purpose of Study: Approach to concussion management has rapidly evolved in the last decade with increases in research and concern on long-term concussion effects. In particular, prescription of rest has become nuanced, and the recommendation of complete, strict rest may no longer be appropriate for each concussion case. Generally in the acute phase of injury (24-36 hrs) cognitive and physical rest is appropriate (Schneider, et al), yet recent research shows that complete rest following injury shows little benefit, and instead calls for relative rest, where some level of cognitive and physical activity is introduced within 24-48 hrs or injury (Gupta, et al). Considering the pace at which concussion research and subsequent protocol is evolving, it's important to assess the state of concussion education, particularly regarding management, starting from medical and physical therapy students. This is an expansion on a previous assessment of medical and physical therapy students' knowledge of concussion and their desire for more education, with this present study assessesing students' understanding of concussion management, particularly as it pertains to the prescription of rest following concussion.
Methods Used: An electronic survey was distributed to current allopathic medical and physical therapy students from all years of training in the United States. The survey included 16 questions; four regarding demographics, six of which assessed knowledge on concussion diagnosis and treatment, and four that assessed concussion education exposure. Responses to a 'select all that apply' question assessing knowledge on concussion management were measured, specifically the proportion of students who selected 'physical rest is always recommended following concussion' and 'mental rest is always recommended following concussion'.
Summary of Results: Our previous study on this data set found that about 50% of respondents correctly identified the definition of concussion. Data collection is still ongoing but initial responses show that over 90% of respondents selected 'physical rest is always recommended following concussion' and 'mental rest is always recommended following concussion'.
Conclusions: Our early results suggest the majority of medical and physical therapy students believe rest is always recommended following concussion. Positive selection of options that state that rest is always recommended could be reflective of the fact that students are unaware of evolving and nuanced guidelines regarding rest following concussion. Alternatively, the wording of the survey question could adjust to adequately allow students to discern their specific knowledge regarding rest after concussion. Overall, our results also show that students would like more concussion education in their curriculum; part of ongoing education should include updated protocol on concussion management.

 # 534

IMPACT OF CLINICAL ROTATIONS/SHADOWING ON CONCUSSION KNOWLEDGE AMONG MD/PT STUDENTS IN THE US

Iqbal F[4, 5], Lupori E[1], Wang D[4, 5], Cheung W[4, 5], Tangog EA[4, 5], McKay L[3], Alsky T[2], Baron D[4, 1]. [1]Western University of Health Sciences College of Osteopathic Medicine of the Pacific - Northwest, Lebanon, OR; [2]The University of Arizona College of Medicine Tucson, Tucson, AZ; [3]University of California, Irvine School of Medicine, Irvine, CA; [4]Western University of Health Sciences, Pomona, CA and [5]Western University of Health Sciences College of Osteopathic Medicine of the Pacific, Pomona, CA

Purpose of Study: Gardner and Heron reported earlier this year that the state of concussion education among North American medical students was lacking.[1] We are investigating if having exposure to concussion education through shadowing and/or clinical rotation settings corresponds to increased concussion awareness. Overall, this survey is designed to assess the levels of concussion knowledge among allopathic medical students and physical therapy students in the United States. Some of the factors that were assessed were year in school, method of concussion education, and past history of concussion. By assessing these factors, our goal is to determine if certain types of exposure to concussion education lead to higher knowledge on the topic. Furthermore, the findings of this study may be used to shape the allopathic medical and physical therapy curricula to include methods of concussion education that result in higher levels of knowledge.

Methods Used: A Qualtrics survey was used to assess student exposure to and knowledge of concussions. The electronic survey consisted of 17 questions, including demographics, exposure to and education of concussions, concussion knowledge, and student interest in concussion education being incorporated into their school curriculum. These surveys were sent to students in allopathic medical schools and physical therapy schools in the United States.

Summary of Results: From the preliminary findings from 429 respondents, 41.71% of respondents were in their third or fourth years of allopathic medical or physical therapy programs. 18.09% of all respondents reported learning about concussions, at least in part, through shadowing/clinical rotations. 79.79% of respondents stated that they wanted to have more formal education on concussions and the appropriate treatments.

Conclusions: Data collection is still ongoing, but the preliminary findings suggest that having concussion education incorporated into clinical rotations/shadowing may impact student knowledge of concussions on survey questions. This may indicate a benefit to learning about concussions in the clinical setting versus not. This study could also lend itself to future research studying the benefits of teaching certain aspects of medical/physical therapy curricula in a clinical setting.

[1]Gardner N, Heron N. A Scoping Review: Mapping the Evidence for Undergraduate Concussion Education and Proposing the Content for Medical Student Concussion Teaching. International Journal of Environmental Research and Public Health. 2022; 19(7):4328. https://doi.org/10.3390/ijerph19074328

 # 537

TRAINING ADEQUACY AND CONFIDENCE LEVEL FOR CARING FOR POPULATION WITH DISABILITY AMONG AMERICAN MEDICAL STUDENTS

Eaton L[1], Mooney T[1], Lucara KM[1], Andrews K[1], Spaan J[1], Fuchs S[2]. [1]Western University of Health Sciences, Lebanon, OR and [2]Western University of Health Sciences, Pomona, CA

Purpose of Study: The objective of this study was to investigate if changes to medical education might be necessary to better prepare students to care for future patients with disabilities. Specifically, we aimed to compare differences between (1) 3rd and 4th year students, (2) schools with official disability training and those without, and (3) allopathic (MD) and osteopathic (DO) medical schools.
Methods Used: For this study, we sent a 30-question survey to accredited American medical schools: 46 osteopathic schools (DO) and 152 allopathic schools (MD). The survey was open for one month during July. The participating schools shared the survey with their 3rd and 4th year medical students and provided information about their formal disability training. The data collected from the survey was analyzed using descriptive statistical methods and groups were compared using Spearman's rank correlations, Wilcoxon rank sum tests, or Kruskal-Wallis rank sum tests.
Summary of Results: Only 5 (10.9%) of the DO schools and 4 (2.6%) of the MD schools that were contacted agreed to participate in our study. Of those, only 12 MD students and four DO students submitted a survey. The results indicated that students felt prepared to care for patients with most disabilities only when they received more training in medical school. Furthermore, most students wished for more disability education and at the same time lacked confidence in their abilities to care for people with disabilities. The majority of participating students had prior experience working with people with disabilities, which may suggest that students who completed the survey displayed bias due to an intrinsic interest in caring for people with disabilities.
Conclusions: The staggeringly low response rate points to a troubling lack of engagement in survey-based research. This means that researchers are failing to acquire the data necessary to incite significant changes in various aspects of medical education. While very limited, our data supports the creation and/or expansion of specific training to teach medical students how to care for patients with disabilities so that they may appropriately interact with and care for patients with disabilities in their future practice. It must be reiterated that data gathered only reflects the disability-related education for a small subset of medical schools in the United State and unfortunately, is likely representative of the lack of interest in care for the 25% of the population who lives with a disability in our country.
Due to the extremely low response rates, this study will need to be repeated. This would preferably occur during the spring semester so that 3rd year students will have acquired some clinical experience. It must be reiterated that data gathered only reflects the disability-related education for a small subset of medical schools in the United State and unfortunately, is likely representative of the lack of interest in care for the 25% of the population who lives with a disability in our country.


Home Birth is Trending:
Attitudes and Perceptions of Home and Hospital Birth on TikTok
Fiona Lane OMS-II, Kelsey Morris OMS-II, Hindi Stohl MD JD, Anita Nelson MD
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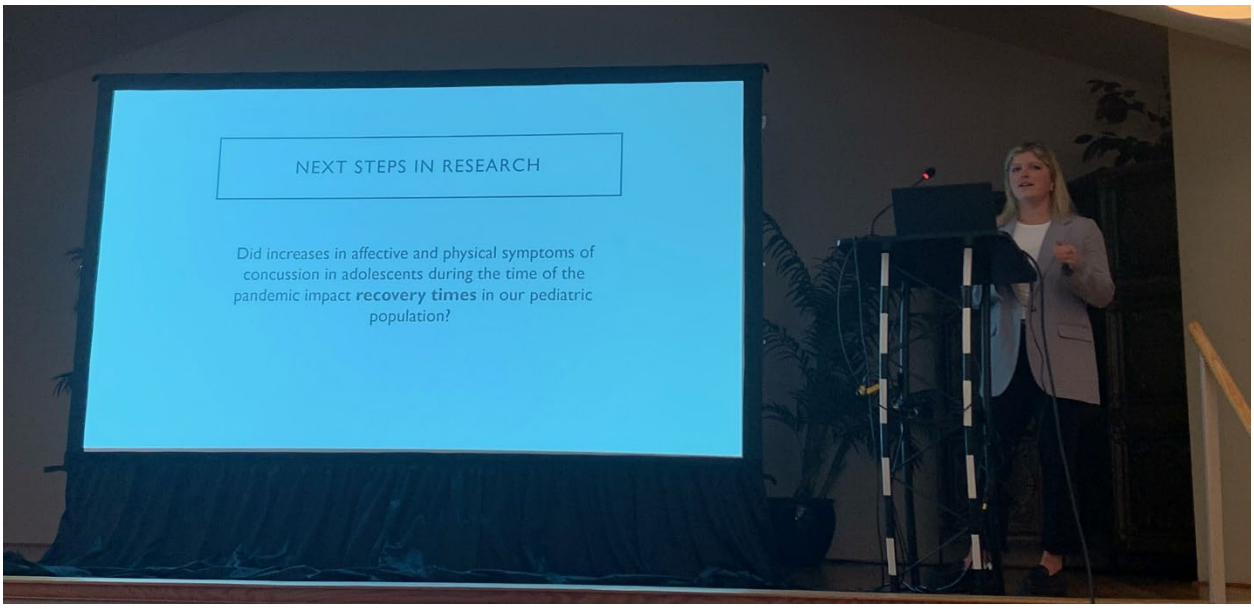
NEXT STEPS IN RESEARCH
Did increases in affective and physical symptoms of concussion in adolescents during the time of the pandemic impact **recovery times** in our pediatric population?


Nutritional Recommendations for Fertility as Promoted on Social Media
Halley Egnew, OMS-III; Nicole Sims, OMS-III; Taryn Carroll, OMS-III;
Allison Modesette, OMS-II; Lillie Blair, OMS-IV;
Anita Nelson, MD