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Writing Proposals for Programmatic Grants

John D. Roberts, Ph.D.
Grant Writers' Seminars and Workshops

Dr. John Robertson holds a Doctorate in Pharmacology/Toxicology and has been an Associate Member at Grant Writers' Seminars & Workshops since 2010. In 2017 he became the Managing Member. He has been the recipient of competitive extramural funding from both the NIH and non-federal sources. He has authored 30 peer-reviewed journal articles and three book chapters. In addition, he has been a member of grant review panels, a reviewer for a number of biomedical journals, and served on editorial boards. He has also been routinely recognized for excellence in teaching.

Writing Proposals for Programmatic Grants

Nani Pybus, Ph.D.
Oklahoma State University

Dr. Pybus is a longtime instructor of the PhD seminar course Special Topics in Grantsmanship at Oklahoma State University. Prior to retirement, she provided strategic proposal development and grant writing services for more than twenty years to research faculty across OSU on behalf of the office of the Vice President for Research. Dr. Pybus received her B.A. Magna Cum Laude, in Linguistics (with Distinction), from the University of Rochester in 1979 and an M.A. in English from Oklahoma State University in 1986. She received her Ph.D. in History (U.S. West) at Oklahoma State University in 2009. Dr. Pybus is also a Certified Research Administrator.

Previously, Dr. Pybus was a Foreign Service Officer with the United States Department of State. She served overseas in postings across the Middle East, Eastern Europe, and Europe and received multiple Meritorious and Superior Honor awards. Dr. Pybus has also served as Principal Investigator for Oklahoma State University on a USAID-funded project delivering educational programming in Iraq. In addition to various other organizations, Dr. Pybus currently serves on the board of trustees for World Neighbors, one of the oldest international development organizations in the United States.

Diversity in Clinical Trials

Megan Myers, Pharm.D.
Director, Cardiology & Metabolism Team
Pfizer, Inc.

Megan Myers, PharmD earned her BS in biochemistry in 2003 from the University of Tulsa and her Doctor of Pharmacy degree from the University of Oklahoma in 2010. She spent the next decade practicing pharmacy in a variety of roles serving patients in both hospital and community settings before joining Pfizer in 2021. Megan is passionate about helping people live healthier lives and, as a Pfizer Medical Affairs colleague on the cardiology & metabolism team, she engages in healthcare dialogue and education with clinicians throughout Oklahoma, Kansas, and Arkansas in order to pursue this collaborative goal.

Keynote Speaker

Debra Furr-Holden, Ph.D.
Dean of the School of Public Health
Professor of Epidemiology
NYU School of Global Public Health

The NYU School of Global Public Health begins a new chapter along its path to excellence in education, research, policy and practice with the appointment of C. Debra M. Furr-Holden, an epidemiologist and passionate advocate for health equity, as Dean of GPH and Professor of Epidemiology. A public health professional with broad expertise in health disparities and policy-level interventions toward health equity, her scholarship encompasses a range of topics including drug and alcohol dependence epidemiology, psychiatric epidemiology, and prevention science.

Dean Furr-Holden hails from Michigan State University, where she was the C.S. Mott Endowed Professor of Public Health and associate dean for public health integration. In announcing her appointment, effective July 2022, NYU President Andrew Hamilton noted Dr. Furr-Holden's extensive experience working with local and national policymakers, her skill at team-building and success as a mentor, and her exceptional talent as a communicator on public health and health equity issues.

Indeed, it is Dean Furr-Holden's action-oriented research and commitment to training the next generation of public health practitioners that dovetails perfectly with GPH's mission to use data-driven interventions and cutting-edge innovation to identify and implement equitable solutions to both domestic and international public health challenges.

In addition to her endowed professorship at MSU, Dr. Furr-Holden served as director of the NIH-funded Flint Center for Health Equity Solutions at the College of Human Medicine. During the Covid-19 pandemic she was appointed to the Michigan Coronavirus Task Force on Racial Disparities, the Greater Flint Coronavirus Task Force on Racial Inequity, and the New York City African American Covid-19 Task

Force. Most notably, in Michigan and Flint the racial disparity in Covid-19 cases and deaths among African Americans was eliminated.

Prior to her appointments at MSU Dr. Furr-Holden was an assistant (2007) and later associate (2011) professor at Johns Hopkins' Bloomberg School of Public Health, where she retains an appointment as an adjunct professor. Before Johns Hopkins, she was a research scientist at the Pacific Institute for Research and Evaluation and a faculty member at Morgan State University.

Dean Furr-Holden is a widely published scholar whose writings include more than 120 peer-reviewed papers in high impact journals. In 2021 she published a seminal article in Addiction that highlighted racial disparities in opioid overdose deaths over the past two decades, and she was recently quoted in an exclusive article in The New York Times examining the demography of deaths nationwide from Covid-19.

Dean Furr-Holden is the recipient of numerous awards and honors, including the White House Presidential Early Career Award for Scientists and Engineers; the Michigan State University College of Human Medicine Junior Faculty Mentoring Award; and the Meeting the Moment for Public Health Award, recognizing the Michigan Coronavirus Task Force on Racial Disparities, of which she is a founding member.

Establishment and Applications of Intestinal Organoid Cultures

Senait Assefa, PhD, Karissa LeHew, BS, Sadie Lincoln, BS, Dolores Vazquez Sanroman, PhD, and Gerwald A. Koehler, PhD
Senait Assefa, PhD, Staff; senait.assefa@okstate.edu

Background: Two-dimensional *in vitro* cell culture and animal models have limitations to address questions related to human health and disease. Advances in three-dimensional organoid culture furnish robust technologies that can bridge the gap between 2D monolayer cell cultures on one side and animal models or human subjects on the other side. Organoids are *in vitro* miniaturized and less complex model systems of organs that recapitulate the complex organization and functionality of tissue features that resemble those *in vivo*. Importantly, in contrast to cultures of primary or immortalized cells, organoids are three-dimensional configurations that self-renew *in vitro,* allowing the capacity for expansion, differentiation, and damage repair. Organoid technology has gained enormous interest for studying intestinal stem cell activities, for modeling intestinal tissue development and disease, and for personalized medicine, drug screening and regenerative therapy *in vitro*. We have begun to establish an intestinal organoid culture system from mouse intestine using MatrigelÒ in organoid medium containing Epidermal Growth Factor/ R-spondin 1/Noggin which mimic the intestinal epithelium. In this context we are interested in establishing intestinal organoids that will be used to explore the expression of intestinal crypt stem cell proliferation and differentiation markers following exposure to opioids, environmental toxins, or specific microbes.

Materials and Methods: In order to establish successful organoid culture workflows in our laboratory, we first used commercially available intestinal organoids from mice under the recommended incubation and growth conditions (StemCell Technologies). Subsequently, small intestinal crypts were isolated from a single C57BL/6 five to six months old mouse by a tissue dissociation procedure. Approximately, 500 to 1500 crypts were embedded in 50 ml Matrigel domes and cultured in an organoid growth medium containing essential growth factors in 24 well cell culture plates at 37°C in a CO_2 incubator, essentially following the already established workflow. For cryopreservation, mature organoids were resuspended in CryoStar™CS10 freezing medium. Mature organoids were also used for total RNA isolation and immunohistochemical staining for mRNA analysis and protein detection, respectively. The stem cell marker Lgr5, the proliferation marker Ki-67, and various indicators for cell differentiation (Paneth and goblet cells, enteroendocrine, and enterocytes were examined.

Result: We have successfully established a three-dimensional *in vitro* organoid culture system from isolated mouse small intestinal crypts. The isolated crypts produced organoids with a crypt-villus like configuration similar to the commercially available mouse organoids. Expression analyses indicated active stem cell renewal and differentiation. Future applications will be discussed.

 Conclusion: We have an intestinal organoid generation workflow for in place that will allow us to the use organoids to study stem cell activities during exposure to drugs, toxic substances, and microbiota.

Key words: Intestinal crypts, organoids, self-renewal, Matrigel

Reconstructed anatomy and mass properties of dinosaurs suggest interactions in the ecosystem of *Tyrannosaurus rex*

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Introduction/Objectives: Ecological roles and adaptations in animals relate to their mass properties (mass, centers of mass, and rotational inertia), which influence ecologically critical aspects of lifestyle including speed, agility, life history, and thermoregulation. While this is informative for an individual animal's potential performance, investigating mass properties of multiple taxa within the same ecosystem allows for comparisons pertinent to interspecific interactions, such as those between predators and prey. The objective of this study is reconstruct anatomy and rotational inertia of large dinosaurs from the end their reign in western North America, so that we can make inferences about these interactions.

Methods: We used ZBrush 2023 to sculpt life restorations of 9 non-avian dinosaur taxa from the late Maastrichtian of northern Laramidia, restoring soft tissue anatomy using skeletal diagrams and examination of mounted skeletons, as well as digitized 3-dimensional skeletons where available. These models were then split into axial body and whole-body models. We also reconstructed the negative space created by the respiratory system, including the trachea, lungs, and air sacs in the case of theropods, and used MeshMixer to subtract the respiratory space from the models. The resulting models were imported into MeshLab, where we calculated mass and rotational inertia for both whole and axial bodies.

Results: Our sample of dinosaur taxa broke down into four categories of body mass, rotational inertia ranges, and proximate likelihood of interaction. (1) All adult taxa with body mass $\leq$300kg, had rotational inertias (RI) <100kg*m^2; (2) adults of body mass ranging from 300-1000kg had RI from 100-1000kg*m^2, (2) subadults of taxa from the final category, between 1000-5000kg in body mass, had RI between 1000-10,000kg*m^2; (4) taxa with body masses greater than 5000kg and rotational inertia higher than 10,000kg*m^2. *Triceratops* has lower rotational inertia than *Tyrannosaurus rex* of similar body mass, though *Edmontosaurus* and *Tyrannosaurus rex* converge in rotational inertia values at large body sizes, while *Struthiomimus*, *Dakotaraptor*, and *Pachycephalosaurus* all converge in rotational inertia values with those estimated for a juvenile *Tyrannosaurus rex*.

Conclusions: These results show that the largest dinosaurs of the late Maastrichtian of northwestern North America segregated into their own bin of mass properties relative to other members of their ecosystem. This may indicate an ecological class, with adults of these taxa interacting more often with each other than with adults of other taxa. The differences in rotational inertia between *Triceratops*, *Edmontosaurus annectens*, and *Tyrannosaurus rex* suggest hypotheses of differing predation tactics by the latter and predator deterrence by the former. The mass properties obtained in this study will enable testing of hypotheses including musculoskeletal torque to estimate angular and linear accelerations, and further comparative data from extant animals and ecosystems will test parameters important for inferred predation strategies.

Keywords: Biomechanics, Dinosaurs, Paleoecology

Osteohistology, New Mass Estimates, and Possible Chimerism of the Titanic Jurassic Theropod *Saurophaganax maximus*

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Background: Distinguishing and defining different species of extinct animals can be problematic because paleontologists rely heavily on gross morphological characteristics. As such, dinosaurs that experienced drastic shifts in their skeletal structure during ontogeny have often been mistaken for multiple distinct species. When specimens are suspected to belong to a single species at different ontogenetic stages, osteohistology can reveal whether an individual was a fast-growing juvenile or a skeletally mature adult. For example, a small tyrannosaur specimen contemporaneous with *Tyrannosaurus* was initially described as a new genus before a later analysis showed that the individual was a juvenile *T. rex* instead of a new taxon. Similarly, dinosaur species that seem to be larger variants of other species may represent skeletally mature adults. This may be the case with Oklahoma's state fossil, the giant carnivorous dinosaur *Saurophaganax maximus*, which paleontologists also hypothesize to be a massive, skeletally mature *Allosaurus*. Therefore, a reanalysis of the material focused on determining its ontogenetic stage may elucidate its taxonomic status.

Methods: To assess the hypothesis of skeletal maturity, a left metatarsal IV (OMNH 01464) attributed to *Saurophaganax* was sectioned using standard petrographic thin sectioning techniques to assess the ontogenetic stage of the individual the bone belonged to. Mid-diaphyseal femoral circumference measurements were collected using a fabric tape measure to estimate the individual's mass. Additionally, the material previously used to describe *Saurophaganax* was reassessed.

Results: Preliminary mass estimates suggest that *Saurophaganax* was significantly heavier than previously thought, with the thickest femur yielding a mass estimate of 4.8 metric tons using the linear extant scaling methods described in Campione and Evans 2020.

Despite extensive diagenetic modification of the metatarsal, enough of the original bone's structure was maintained to make inferences about *Saurophaganax*'s growth. Osteohistology of the metatarsal IV revealed a largely avascular external fundamental system indicating that it had attained skeletal maturity, though it is possible that other elements from the same individual would lack an EFS due to differential growth rates. The distribution of plexiform bone indicates that the individual reached its massive size before its growth slowed as it approached skeletal maturity.

While many of the elements of *Saurophaganax* unmistakably belong to a massive theropod, some elements used to distinguish it from *Allosaurus* bear noteworthy sauropod affinities. For example, while the craniocaudally elongated distal blades of the *Saurophaganax* chevrons are distinct from those of *Allosaurus*, they closely resemble those of diplodocids, which can be similarly craniocaudally elongated. This suggests that *Saurophaganax* is likely chimeric in its referred diagnostic elements.

Conclusions: New mass estimates of *Saurophaganax maximus* indicate that it was heavier than originally thought, with the heaviest individual reaching an estimated mass of 4.8 tonnes. Additionally, osteohistology of a metatarsal shows an EFS and that the individual attained its large size through rapid growth before deposition of the EFS, rather than prolonged slow growth. *Saurophaganax* may also be chimeric as originally described, but further analysis is required to test this hypothesis.

Keywords: Osteohistology, taxonomy, ontogeny, Dinosauria

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Hand Morphology and Biomechanics in the Gray Fossil Site Mastodon with Implications for Giant Body Size in Terrestrial Animals

Introduction: An early and species-rich proboscidean lineage was *Mammut* (mastodons), forest browsing elephant relatives that appeared in North America during the late Miocene and became widespread through the Pleistocene, with the American mastodon (*Mammut americanum*) being the most abundant and well-known in North America. *Mammut* were typically 5-8 tons and 2.3-2.8 meters tall at the shoulder. However, a discovery of a giant mastodon at the Tennessee Gray Fossil Site (GFS) highlights subtle differences in the hand that make elephant forefeet characteristics worth exploring into more detail. With the GFS representing a forested refugium in a time of changing environments 4.9-4.5 mya, the site is critical to understanding late Hemphillian-age faunal diversity in the east. An incredibly large mastodon living in steep forests would have challenges navigating a dense habitat. Pertinent key features of the GFS mammutid are its unusually large size of 13-16 tonnes, its trifurcated terminal phalanges, and unique thumb (pollex) apparently angled laterally from the rest of the manus. With the GFS acting as a refugium amongst changing environments, and the GFS proboscidean representing an early mastodon, discovering what makes it different is crucial to understanding early mastodon species and how they compare to other proboscideans.

Methods: To understand comparative manus mechanics of the GFS mastodon, we describe its osteology and apply finite element analysis (FEA). We start by reconstructing the hand musculoskeletal arrangement. We estimate forces on the manus based on the animal's body mass, duty factors during locomotion, and muscle forces to act on the manual elements in various motions from standing, walking, and running gaits. For FEA we apply these forces and bone material properties virtually to the specimen and simulate stress and strain of locomotion.

Results: The GFS mastodon has a splayed manus. Phalanges attached to the first metacarpal (MC1) are oriented at a lateral 45°, allowing the manus to have an overall wider, flatter structure for stability than seen in typical proboscideans lacking the lateral orientation shift. Compared to other proboscidean taxa where digit I is more elevated in the fat pad, the GFS mastodon's digit I is a more active digit, connecting more firmly with the ground, with very large, flat MC1 articular surfaces for proximal and anterior extended mobility during compression. The second metacarpal also lacks a connection with MC1, further demonstrating the lateral extension MC1 exhibits and the absence of an articular limit for a narrow range of movement. FEA maximum stresses of 8 MPa in a walking gait indicates that the manus had high safety factors at low speeds, suggesting the broad manus and divergent first digit enhanced potential capability to traverse high relief terrain.

Conclusions: The mastodon's thumb was potentially a means to support its incredibly large self on steep terrain since it lived within the Appalachian Mountains roughly 5 million years ago.

Keywords: mastodon, stability, adaptation

Supernumerary cranial bone occurrences within coyotes (*Canis latrans*)

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Wormian bones, also known as intrasutural bones, are supernumerary bones that variably develop from separate ossification centers within the sutures and fontanelles of the skull. Wormian bone etiology is not definitively understood, as pathological, mechanical, and genetic hypotheses have been suggested. The majority of research regarding Wormian bones has been done on humans and few studies have systematically examined non-human animals. To fill this gap in knowledge, we extensively surveyed coyote (*Canis latrans*) specimens, which are plentiful in museum collections. Here, we aim to gain insight regarding intraspecific variation of Wormian bones. *C. latrans* is a carnivorous canid that is well-suited for this study because it allows comparisons to other previously surveyed carnivoran taxa that allow us to test for common correlations between the presence and anatomical location of Wormian bones and stresses or other internal or external factors induced by a carnivorous diet. We hypothesize that the locations of Wormian bones within *C. latrans* and other carnivorans will be correlated with their phylogenetic relationships or ecological roles, contrasting with our null hypothesis of a random distribution of Wormian bone occurrences.

We systematically examined 239 complete skulls of *C. latrans* in the Oklahoma State University Collection of Vertebrates for occurrences of Wormian bones. When found, the Wormian bone's suture location was recorded along with the specimen's sex and collection locality if available. Our location categories were based on anatomical suture (i.e: coronal, sagittal, frontal) or fontanelles (i.e lambda, bregmatic) with a total of 12 categories.

Out of the 239 specimens examined, 29 had at least one Wormian bone, which is 12.18% of our sample. The most represented categories were the frontal-palatine (20.6%), the maxilla-frontal (13.8%), and the coronal (10.3%). Our data differs from a study on bobcats (*Lynx rufus*) that found bregmatic bones in 11.6% of the total sample, while we only found a 0.4% occurrence rate in *C. latrans*. We found a higher occurrence of all Wormian bones in coyotes than a previous study that found a rate of 5.20% in canids. However, this study did not specify which species were examined and only had a sample size of 19. We fail to reject the null hypothesis that our results deviate from a random distribution of Wormian bones across observed sutures. Additionally, we found no difference in the occurrence rate of Wormian bones for sex or collection locality.

This is the first large systematic study of non-human Wormian bones that accounts for species, sex, collection locality, and multiple suture locations. Our results show that there is no potential bias towards suture location of Wormian bones in coyotes and therefore no strong correlations can be made with localized variables acting upon particular sutures.

Future work will involve examining other taxa for comparison in order to evaluate Wormian bone proportions across the mammalian clade.

Keywords: skull, coyote, anatomical

Screening of Tetraspanin CD63 Protein Interactors using Alto SPR

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Background: CD63 is a cell surface antigen that is a member of the tetraspanin superfamily with four transmembrane domains and variable loops. CD63 is a main component of the membranes of Weibel-Palade bodies that are associated with inflamed endothelial cells. CD63 is also a biomarker for activated platelets after α-granule release during inflammation. Weibel-Palade bodies and α-granules both secrete the multimeric glycoprotein von Willebrand factor (VWF) that tethers platelets to the site of injury during inflammation. The metalloprotease ADAMTS13 regulates VWF-induced platelet aggregation to prevent clot formation.

Aim: The objective of this study was to determine protein-protein interactions between CD63 and VWF and ADAMTS13 proteins.

Methods: The Alto system integrates digital microfluidics with localized surface plasmon resonance (SPR) biosensors to study biomolecular interactions. We applied the Alto SPR platform to utilize its protein-protein interaction screening capabilities. In this study, the recombinant human CD63 was immobilized on the biosensors and probed against VWF, ADAMTS13, and related protein variants.

Results: After screening 24 VWF, ADAMTS13, and related protein variants at a low and high concentration level against the recombinant human CD63 ligand, the direct screen test yielded a heat map overview of bound/not-bound status of each analyte sample screened. In addition to the heat map, each sample had a corresponding sensorgram that provided preliminary kinetic parameters such as association rate (k_a), dissociation rate (k_d), and dissociation constant (K_D).

Conclusions: The Alto SPR system provides the advantage of performing label-free analysis of biomolecular interactions using minimal sample volumes. After identifying protein-protein interaction hits between CD63 and VWF/ADAMTS13 proteins, we will apply the Alto SPR to perform kinetic binding studies that will yield kinetic parameters between CD63 and identified protein interactors.

Keywords: CD63, inflammation, SPR

Preventing *Clostridioides difficile* Infections: Development of an Oral Mucosal Vaccine for Enhanced Protection

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Clostridioides difficile is a gram positive, spore forming, toxin producing anaerobe and one of the leading agents of antibiotic associated diarrhea. The Centers for Disease Control and Prevention (CDC) list *C. difficile* infections as an urgent threat. The disruption of the normal gut microbiota using antibiotics is the main risk factor for infection. This infection is primarily mediated by the production of toxins; *TcdA* and *TcdB*, and in some hypervirulent strains a binary toxin (CDT) is also present. *C. difficile* infections (CDI) can range from mild diarrhea to pseudomembranous colitis and if left untreated can lead to death. Currently, acute infections of CDI are treated with either Metronidazole, Vancomycin, or Fidaxomicin. These antibiotics are non-specific to *C. difficile* and have the side effect of continually disrupting the normal microbiota of the gut which is essential to provide resistance to CDI. Development of novel preventive measures against CDI are therefore considered a priority. Ongoing work in our lab involve the development of an oral vaccine. In a mouse model of CDI, we previously demonstrated that using a recombinant receptor-binding domain of *C. difficile* toxin B produced by *Escherichia coli (rTcdB)* as the antigen was effective in producing robust antigen specific IgA and IgG antibodies. These robust antibody responses to the *C. difficile* toxin were enough to prevent disease, however, it failed to reduce bacterial burden leaving the potential for asymptomatic spread and relapses of disease. To combat this, we are working on two solutions. First, we wished to test a new pH sensitive polymer (Eudragit®) to coat *rTcdB*. The controlled release of antigen into the lower gastrointestinal tract might generate a stronger and more robust antibody response. Second, we are also evaluating the immunogenicity using fusion proteins combining *rTcdB* with *C. difficile* surface proteins in a mouse model. When screening multiple formulations of encapsulated *rTcdB* in a mouse model multiple groups had significantly increased antigen specific IgG responses. Our preliminary results demonstrated that Eudragit® encapsulated *rTcdB* induced positive but relatively low level of antigen specific IgGs when delivered orally. Indicating Eudragit® may not be a good candidate for oral vaccination. We are currently working on modifying the formulations as well as testing the immunogenicity of different fusion proteins. We hypothesize that a two-target approach may decrease the bacterial load and lead to complete protection against CDI.

The Relationship Between Restricted Ankle Dorsiflexion and Knee Kinematic Changes During Static and Dynamic Movements in Physically Active Adults: A Critically Appraised Topic

Jess Monnier, Tatum Komlodi, Matthew O'Brien ,PhD, LAT, ATC, PES, CES
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Clinical scenario: Knee injuries are prevalent among athletes across a multitude of sports whether it be females or males. Restricted joint motion above or below the knee joint can contribute to the incidence of these injuries during static or dynamic movements.

Clinical Question: Can restricted ankle dorsiflexion cause knee kinematics changes during static and dynamic movements in physically active adults?

Summary of Key Findings: A literature search was conducted on the relationship between restricted ankle dorsiflexion and knee kinematics. Three studies that measured weight-bearing ankle dorsiflexion and knee kinematics through static and dynamic movements were included. One study demonstrated that a decrease in ankle mobility can lead to knee landing errors. The other two studies indicated that restricted ankle flexion can lead to an increase in knee valgus and internal rotation at the knee.

Clinical Bottom Line: There is moderate evidence that supports restricted ankle dorsiflexion could contribute to changes in knee kinematics during static and dynamic motions.

Strength of Recommendation: Based on the Physiotherapy Evidence Database, these studies are categorized as a 7 out of 10 in that restricted ankle dorsiflexion can cause changes in knee kinematics during static and dynamic movements.

Keywords: ankle dorsiflexion, knee kinematics, knee injuries, ankle mobility, rotational movements

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Anaerobic Techniques for the Cultivation of Novel Microbes

Introduction: The human microbiome encompasses a vast array of bacteria, numbering in the trillions, which intricately contribute to essential human physiological functions such as immunity, digestion, and metabolism. Advanced sequencing techniques and innovative "-omics" approaches have substantially expanded our understanding of these bacterial communities. Despite these advancements, an overwhelming 99% of microbes remain uncultivated and therefore pose an untapped resource for identifying both targets for disease prevention and mechanisms for promoting health. Many microorganisms in the human body grow anaerobically and syntrophically, evading traditional cultivation techniques. To recover these previously unknown microbes, we have developed specialized techniques to replicate *in vivo* conditions, including systems based on low partial pressure and anaerobic respiration, where energy is gained via electron transfer rather than carbohydrate fermentation.

Methods: In the laboratory, we have constructed a gassing manifold that allows for the selection of gaseous substrates to purge oxygen from culture vessels. Features such as pressure-control and the ability to vacuum headspace of sealed tubes provide a controlled means of making anoxic micro-atmospheres for growth. Pure cultures are obtained using a roll tube device engineered to spin Balch tubes while agar solidifies along the inner walls, creating an anaerobic petri dish-like surface for colony formation. Finally, a vinyl anaerobic chamber filled with N_2, CO_2, and H_2 functions as a workspace free of oxygen for all subsequent experimentation.

Results: These efforts have led to the discovery of several novel taxa isolated from vole caecum, including two candidate families and a new species of *Lactobacillus*. 16S rRNA gene sequencing of one such isolate, Erysipelotrichaceae sp. OSU-370, revealed low nucleotide similarities with any previously described bacteria, matching only 89% with its nearest phylogenetic neighbor, *Dubosiella newyorkensis*. Based on preliminary *in silico* data from genome-mining, combined with evidence from previous microbiome studies which implicated members of this clade as beneficial modulators of human health, we hypothesize that this novel organism is involved in cognitive protection, increased longevity, and improved liver function.

Conclusions: Future work will focus on the polyphasic characterization of isolated OSU-370 and evaluating its therapeutic potential in promoting healthy aging using animal models. Finally, further use of advanced anaerobic methodologies will be instrumental for uncovering additional key contributors in the host-microbe dialogue that can be harnessed for precision medicine of the future.

Keywords: Microbiome, Anaerobe, Phylogenetics

Is Dry Needling an Effective Treatment for Patellofemoral Pain Syndrome?:
A Critically Appraised Topic

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Clinical scenario: Patellofemoral Pain Syndrome (PFPS) is a common knee pathology found often in females. The poor biomechanical and neuromuscular factors that contribute to the dysfunction and pain seen with PFPS may be addressed with the implantation of dry needling techniques.

Clinical Question: Is dry needling an effective treatment method for decreasing pain and increasing function in patients with patellofemoral pain syndrome?

Summary of Key Findings: Two studies demonstrated that dry needling in combination with traditional knee therapy increases the function and pain in those with PFPS. One study found improvement in pain, physical function, and VMO/VL coordination in PFPS patients. One study demonstrated that those given dry needling experienced a clinically meaningful reduction of pain.

Clinical Bottom Line: The evidence suggests that the use of dry needling as a therapeutic technique improves pain and overall function in individuals with PFPS, especially in conjunction with traditional strength training rehabilitation. Strength of Recommendation: Based on the PEDro scale grading criteria, these studies provide good to excellent evidence that dry needling can increase function and decrease pain for individuals with PFPS.

Keywords: Knee Pain, Function, Anterior Knee Pain, Pain Reduction

A Quality Improvement Project to Improve Education About Sudden Infant Death Syndrome (SIDS) for Staff Members at Child Legacy International in Malawi, Africa

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Sudden infant death syndrome (SIDS) is the unexpected and unexplained death of a seemingly healthy infant. Significant risk factors for SIDS include sleeping position and sleeping environment. In well-developed countries, SIDS is a widely understood and preventable cause of infant mortality. In Malawi, Africa however, little is known about SIDS. The goal of this quality improvement project is to educate the staff of Child Legacy International (CLI) Hospital in Malawi, Africa about SIDS, ways to prevent it, and how to educate their patients in order to reduce the risk of infant mortality.

An initial cross-sectional survey will be conducted with hospital/clinic staff at Child Legacy International to assess their baseline knowledge and understanding of SIDS and whether education about SIDS is being provided to new mothers of infants. Next, a video lecture about SIDS and SIDS prevention will be delivered to the staff at intervals of once monthly for 3 months. Additional resources such as posters and informational brochures will be given to staff to implement into their prenatal and postpartum education and to give to new mothers after delivery. After the project has been completed, the same cross-sectional survey will be conducted for hospital/clinic staff to compare their pre- and post-implementation knowledge on SIDS and SIDS prevention. This will determine whether or not video lectures and educational material improved their knowledge or not. Results of this project have not yet been collected.

Keywords: Malawi, Global Health, SIDS, Infant death

Exploring the Pharmacodynamic Properties of Fentanyl: A Comparative Analysis of Intraperitoneal Injection and Vapor Self-Administration in a Mouse Model of Substance Use Disorders

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Introduction: Amidst the ongoing opioid crisis, there is a critical need for research to comprehend the underlying mechanisms of substance use disorders and investigate potential treatments. While intravenous fentanyl administration stands as a gold standard in mouse studies, it presents challenges such as difficulty in placing catheters in mice and frequent catheter failure, hindering experimental progress. This study introduces an innovative vapor self-administration model for fentanyl delivery, aiming to evaluate the pharmacodynamic properties of fentanyl when administered passively through vapor.

Methods: A series of experiments were conducted involving three groups of mice: intraperitoneal injection of fentanyl, passive vapor self-administration using equivalent doses, and a control group for each experimental group. The analgesic effect of fentanyl was assessed through the hot plate test over a period ranging from 5 to 120 minutes. Mice were placed on a hot plate, and specific signs were evaluated within a 30-second window following fentanyl administration.

Results: The analgesic effect of fentanyl was examined using the hot plate test, and a dose-response curve was constructed, revealing comparable responses in mice for both intraperitoneal injection and passive vapor self-administration of fentanyl.

Conclusions: The utilization of the vapor self-administration model represents a promising advancement in the field. Our data illuminate this method from a pharmacological perspective, demonstrating a robust analgesic effect of fentanyl through vapor self-administration, comparable to intraperitoneal administration. Further experiments are warranted to explore the full range of properties associated with this methodology.

Keywords: Fentanyl; Vapor-self administration; Opioids; Substance Use disorders

Melan-A Positive Granular Cell Tumor with Extensive Intraneural and Perineural Spread: A Rare Case Report

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Introduction: This case report demonstrated an uncommon manifestation of Melan-A positive granular cell tumors (GCTs), typically benign and originating from Schwann cells. Challenges related to histologic variants, infiltrative growth patterns, perineural invasion, and Melan-A expression are discussed. The study covers GCTs histogenesis, clinical associations, differential diagnosis with melanoma, and criteria for identifying malignant GCTs. A suggested immunohistochemical panel, including Inhibin-A and PRAME, is proposed for Melan-A positive GCTs.

Case Presentation: A 27-year-old male presented with two tender subcutaneous nodules (approximately 0.5 cm each) on the left second digit's dorsal aspect and the right hand's proximal palm. Clinical differentials included cyst, neuroma, and fibromatosis. The patient had a previous benign GCT on the back. Personal and family medical histories were unremarkable.

Histologic Examination: Biopsy of the left dorsal second digit revealed a GCT with classic appearance, similar to the patient's previous back nodule. The palm nodule biopsy showed a circumscribed elongated lesion with intraneural and perineural spread. Immunohistochemical evaluation demonstrated positivity for S-100, Inhibin-a, and Melan-A, and negativity for HMB-45 and PRAME.

Conclusions: This report highlights a unique case of multiple GCTs, one with extensive intraneural and perineural involvement and rare Melan-A positivity in a patient with a prior GCT. The rarity of Melan-A positivity in GCTs poses diagnostic challenges, due to it resembling melanoma. Use of a comprehensive immunohistochemical panel, including S-100, Inhibin, Melan-A, HMB-45, and PRAME, demonstrated efficacy in resolving diagnostic dilemmas.

Keywords: Tumor; Immunohistochemistry; S-100; Inhibin; Melan-A; HMB-45; PRAME

The Impact of Depression on Patient Outcomes in Individuals Who Underwent Orthopaedic Trauma: A Critically Appraised Topic

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Clinical Scenario: There are various factors that contribute to a patient's recovery post- trauma, but depression seems to be one of the most neglected factors. It negatively impacts patients, creating disability and dysfunction as an overall outcome. It is commonly overlooked amongst healthcare professionals as part of the treatment plan although it is integral to a full recovery.

Clinical Question: In patients with trauma, is there an increase in post-traumatic dysfunction when the patient is diagnosed with depression?

Summary Key Findings: A literature search was conducted on depression and the impact it has on patient recovery post-orthopaedic trauma. Two prognostic studies investigated the impact that depression has on outcomes and demonstrated it resulted in poorer outcomes of recovery. An additional study observed that depression was a predictor of recovery and a final study found that patients with mental illness (i.e. depression) had worse functional outcomes after injury.

Clinical Bottom Line: Overall, evidence suggests patients who have been diagnosed with depression are more likely to sustain increased post-traumatic dysfunction.

Strength of Recommendation: Based on the Center of Evidence Based Medicine, these studies were a level 3 or higher regarding evidence that depression creates increased post-traumatic dysfunction in patients who undergo orthopaedic trauma.

Keywords: depression; orthopaedic trauma; dysfunction; disability; recovery; outcomes; mental illness

Racial Disparities in Emergency Department Wait Times for Patients Presenting with Chest Pain and Shortness of Breath: An Analysis of the National Hospital Ambulatory Medical Care Survey (NHAMCS) 2019-2021

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Introduction: Extended Emergency Department (ED) wait times are associated with adverse health outcomes, including insufficient treatment rates, admissions, and mortality, especially in patients with chest pain and dyspnea. Given people of racial/ethnic minorities disproportionately experience health disparities, identifying barriers to care in the ED may impact already vulnerable populations, thus improving health equity. Therefore, our primary objective was to assess differences in ED wait times by race for patients presenting with chest pain and dyspnea using the National Hospital Ambulatory Medical Care Survey (NHAMCS) data.

Methods: Using survey weights provided by NHAMCS, we determined national estimates for ED wait times for 2019-2021 by ED triage level for patients presenting with chest pain and dyspnea. We constructed a linear regression to assess the difference in wait times by race/ethnicity. We applied bootstrapping (2000 replications) to account for unbalanced samples between racial/ethnic groupings and controlled for race, sex, age, triage level, and urbanicity.

Results: All racial/ethnic minority groups experienced longer wait times than White patients except for Other/Multiracial. In our linear regression analysis, Black patients (34.66 minutes; SE = 2.95) experienced a statistically significant increase in ED wait times compared to White patients (28.09 minutes; SE = 1), according to the binary model.

Conclusion: Our study demonstrates that racial disparities in the ED persist, given the increased wait times for minority patients. Racial disparities in the ED are complex; therefore, expanding research to identify strategies to further mitigate contributing factors are crucial to reaching health equity.

Keywords: Racial Disparities, ED Wait Times, Chest Pain and Dyspnea

Characterization of von Willebrand factor interaction with the tetraspanin CD63 in Human Umbilical Vein Endothelial Cells

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Introduction: The interaction between von Willebrand factor (vWF) and CD63 in human umbilical vein endothelial cells (HUVECs) is pivotal in understanding the mechanisms of hemostasis and thrombosis. vWF plays a crucial role in blood coagulation and platelet adhesion, while CD63 is involved in cellular signaling and vesicle trafficking. This study aims to elucidate the nature and implications of the vWF-CD63 interaction in HUVECs.

Methods: HUVECs will be cultured in a 24-well plate and treated with histamine dihydrochloride to induce the expression of von Willebrand factor (vWF). For the primary antibody incubation, dilutions of the primary antibody will be prepared in ratios of 1:500, 1:1000, and 1:2000. These dilutions will be added to wells 1, 2, and 3, respectively, along with PBS-T containing 0.5% bovine serum albumin and 0.5% polyvinylpyrrolidone. The cells will then be incubated at 4°C on a rotator overnight. The following day, secondary antibody dilutions will be prepared at a ratio of 1:1000. The cells will be incubated with these secondary antibodies in the dark, covered in a box, at room temperature for one hour. The interaction between vWF and CD63 will be investigated using a combination of techniques: immunocytochemistry for localization, and fluorescence microscopy for visualizing the interaction. This comprehensive approach will allow for a detailed examination of the interaction between these two proteins in HUVECs.Top of Form

Results: The induction of vWF expression in HUVECs is expected to lead to a noticeable increase in its interaction with CD63. Immunocytochemistry and fluorescence microscopy will reveal the co-localization of vWF and CD63 in the cells.

Conclusion: This study demonstrates a significant interaction between vWF and CD63 in HUVECs, suggesting a potential role in endothelial cell function and vascular health. The findings provide insights into the molecular mechanisms of endothelial cell activation and vesicle formation, contributing to our understanding of hemostasis and thrombosis. Further research is necessary to explore the therapeutic implications of targeting the vWF-CD63 interaction in vascular diseases.

Keywords: Von Willebrand factor, CD63, HUVEC, Vascular diseases, Hemostasis, Thrombosis

Exploring Data Sharing Practices in Ophthalmology Journals: A Cross-sectional Analysis

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Background: Open data practices in medical research not only uphold the principles of reproducibility and integrity in scientific endeavors but also pave the way for collaborative advances by allowing researchers to build upon each other's findings. Despite the International Committee of Medical Journal Editors (ICMJE) making data sharing mandatory for clinical trials since 2017, barriers persist in research data sharing. Even decade-old ophthalmological data from the US National Institutes of Health remains unreleased as of 2023. The extent of ophthalmology's adoption of data sharing remains uncertain, influenced by journal and institutional policies, clarity of statements, and dataset prevalence and accessibility. This study aims to investigate the current state of data sharing in ophthalmology, identifying strengths, barriers, and improvement avenues. Understanding these practices is pivotal, not just for the sake of transparency, but also for ensuring the rapid advancement of ophthalmology as a discipline.

Methods: In this cross-sectional analysis, we identified the top ten Ophthalmology journals that published original research articles, ranking them based on the Clarivate Journal Impact Factor scores. We searched and compiled a list of all original research articles published in these 10 journals over the 5-year timeframe from 2018 to 2023. To be included, articles had to be original research studies focused on ophthalmology, providing new primary data (either quantitative or qualitative) and published between 2018 and 2023 in one of the top 10 selected journals. Exclusions comprised review articles, commentaries, editorials, letters, studies unrelated to ophthalmology, and those lacking novel primary data.

Using a standardized extraction form, two researchers independently extracted data on bibliographic details, presence and details of data sharing statements, repository details, study design, journal data policies mentioned, ethical approval obtained, and consent for data sharing mentioned. Two investigators independently conducted data extraction within the sample, resolving discrepancies through discussion. Upon completing data extraction, we computed the number and percentage of articles containing data sharing statements, categorized by journal and publication year.

Results: In the analysis of 1406 screened and evaluated articles, approximately one-fourth of articles included a data sharing statement. Among these, the majority indicated data availability upon request, while one-fifth had data accessible on online platforms. A smaller proportion explicitly mentioned that their data was not available for sharing. Notably, less than one-tenth of articles with data sharing statements had obtained consent for data sharing.

Conclusion: Our cross-sectional analysis of ophthalmology research articles reveals a landscape where data sharing practices are not yet pervasive, despite efforts to promote them. Approximately one-fourth of the examined articles included data sharing statements, with the majority offering data availability upon request and a smaller fraction making data accessible on online platforms. The limited mention of obtained consent for data sharing highlights a significant gap in ethical considerations. This study underscores the existing barriers in ophthalmological data sharing, influenced by journal and institutional policies, clarity of statements, and dataset accessibility. Addressing these issues is crucial not only for transparency but also for fostering collaborative advancements and ensuring the rapid progress of ophthalmology as a discipline.

Keywords: Data Sharing, Ophthalmology, Cross-sectional analysis

Comorbidities among women presenting to the ER with pregnancy complications

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Background: The management of obstetric and gynecological emergencies are focused on the conservation of fertility and sexual function. Common OBGYN emergencies can cause pregnancy complications in the present or future and should be taken into consideration in all women presenting to the emergency department with related complaints. Common comorbidities such as hypertension, diabetes and more can precede OBGYN complications that subsequently can lead to pregnancy complications. Our primary objective was to use the National Hospital Ambulatory Medical Care Survey (NHAMCS) to assess the diagnostics and comorbidities among women who utilize the ED for obstetric and gynecologic care. Secondary objectives are to compare demographics and comorbidities among women who are insured versus uninsured, by region, and urbanicity.

Methods: We conducted a cross-sectional analysis for the 2021 NHAMCS to determine rates of comorbidities among women presenting to the ED for obstetric and gynecologic care. Included in our study are women who presented to the ED for obstetric care identified by ICD-10 diagnostic codes starting with O- and select Z codes reported within any 5 potential diagnoses each participant could have been given. Individuals who were male, nonpregnant, or pregnant but did not have an OB/GYN-related ICD-10 code were excluded from the study. Data extracted included comorbidities, insurance status, ethnicity, age, region, and urban versus rural areas.

Results: Our sample consisted of 446 women aged 16-47. The average age was 27.5 years for women with no comorbidities and 28.8 for women that have a comorbidity. Asthma and Depression were the most common comorbidities reported with 14.35 and 11.59 weighted percentages respectively. Hypertension had a weighted percentage of 8.84%, followed by Substance Abuse or Dependence at 7.56% and Obesity at 7.27%. Any type of Diabetes fell at 5.08%, with all other comorbidities below 1.5%. Of the women included, 40.19% were Non-Hispanic White, 38.42% were Non-Hispanic Black, and 17.34% were Hispanic. There was no statistically significant difference ($F_{(2.61, 221.68)} = 1.6530$ P = 0.1845) in the presence of comorbidities among ethnicities. Medicaid was the most prevalent insurance reported at 56.35%. However, there was no difference in insurance status and comorbidities ($F_{(4.00, 339.99)} = 1.6947$ P = 0.1508) present. The Midwest in comparison to the other regions had a higher prevalence of comorbidities ($F_{(2.85, 242.16)} = 4.1640$ P = 0.0077) present among women. There was no difference in metropolitan versus nonmetropolitan areas and the presence of comorbidities in our sample population.

Conclusions: Women presenting to the emergency department with OBGYN complaints are more likely to have Asthma, Depression or Hypertension as a comorbidity. This should be taken into consideration when assessing OBGYN patients in the emergency department and the effects it can have on pregnancy and future fertility of women. The Midwest region had the highest percentage of comorbidities among all the regions. There were no other significant factors having influence on the presence of comorbidities. Further efforts to determine influences on comorbidities in women presenting to the ED with OBGYN complaints should be conducted to properly treat and prevent further pregnancy complications.

Keywords: Pregnancy, Comorbidities, Emergency Department

Effect of Morphine Withdrawal on Gls1 Gene Regulation in IEC18 Cells

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Introduction: Inflammatory bowel disease (IBD), referring to two specific diseases: Crohn's disease and ulcerative colitis, is a condition characterized by chronic inflammation caused by the immune system attacking the GI tract, eventually resulting in damage. The prevalence of IBD within the United States is particularly alarming with about 3.1 million adults having been diagnosed. In addition, IBD is commonly treated with narcotics, an addictive group of drugs with the potential to subject the patient to dependency and neurological implications. A more desirable approach would be to utilize epigenetics, altering gene expression without manipulating the gene sequence, to treat IBD without such implications. One such epigenetic modification of interest is DNA methylation, in which a methyl group is transferred to the carbon 5 position of cytosine by an enzyme called DNA methyltransferase from a compound called S-adenosylmethionine (SAM) already residing in the cell. Usually, methylation observed in a gene leads to its suppression. However, a paradoxical effect is observed when administering trinitrobenzenesulfonic acid (TNBS) to the intraepithelial cells in the colon of the rat where hypermethylation of the glutaminase1 (*Gls1*) gene results in activation or upregulation. The *Gls1* gene codes for GLS1 protein which is the enzyme responsible for converting glutamine to glutamate, a neurotransmitter. In this study, we utilized TNBS to induce inflammation in intestinal epithelial cells (IEC18) of a rat and observe hypermethylation in the *Gls1* gene, specifically to replicate findings from previous studies using rats in cell culture. IEC18 cells are present in the outermost layer of the colon, the mucosa layer, and are the most exposed cells to TNBS.

Methods: Intraepithelial cells-18 and BV2 were used in this study. Cells were treated with morphine for three days followed by washing these cells with PBS to mimic withdrawal. Cells were then induced with LPS treatments. Azacytidine is used in this study as a demethylating agent. DNA and RNA were extracted from the treated cells and were analyzed for methylation status of the Gls 1 gene.

Results: Morphine withdrawal was unable to modulate Gls1 expression. Morphine withdrawal decreased LPS mediated inflammatory response in IEC18 and BV2 cells.

Empowering Students through a Faculty-Student Mentorship Program

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Introduction: Diversity and cultural competence in osteopathic medical education are critical to both student success and healthcare delivery in rural, marginalized, and underserved communities. The study assesses an intervention designed to develop a diverse and culturally informed workforce through a faculty-student mentorship program. A 40-hour faculty workshop was administered at a leading college of osteopathic medicine. Seventeen presentations delivered 40 hours of content to ten faculty participants over four months. The primary aim of this research is to evaluate the effectiveness of a Faculty Mentorship Program in enhancing academic success and diversity among students in osteopathic medical education. The secondary objective is to assess how this mentorship program influenced participating students' intent to practice in rural and medically underserved areas. Honoring the mission of our College of Osteopathic Medicine, we hypothesize that program participants demonstrate greater cultural awareness and interest in working in rural and underserved communities.

Methods: This study employed a mixed-methods design, utilizing surveys and follow-up interviews to gather comprehensive data. The research was conducted at a US-based College of Osteopathic Medicine. Participants included 10 faculty members and 24 students, all of whom expressed an interest in mentorship. The intervention involved a 40-hour faculty mentorship workshop administered over four months. Following the workshop, each of the ten faculty participants was assigned two to three student mentees, resulting in a total of 24 participating students. The main outcome measures assessed were an increased connection to the field of medicine and the expressed intent to serve in rural and underserved medical practice areas.

Results: Initial findings suggest that student participants feel a greater connection to the importance of practicing medicine in rural and medically underserved communities. This presentation will disseminate lessons learned from mentorship program participants.

Conclusion: Initial findings from this study indicate a positive impact of the Faculty Mentorship Program on academic success and the enhancement of cultural competencies among both faculty and students. The program effectively raises awareness of the benefits associated with future osteopathic physicians practicing in rural and underserved areas. These findings signal a positive course for mentorship programs in osteopathic medical colleges, establishing a solid foundation for further exploration of this study. Emphasizing the transformative power of faculty mentorship in cultivating a diverse and culturally competent medical workforce, our research evaluates the specific outcomes of the Faculty Mentorship Program, focusing on its ability to enhance cultural competencies among underrepresented faculty and students. The program not only facilitates an increased intent to serve in rural and medically underserved areas but also underscores the importance of well-designed mentorship initiatives in fostering diversity and cultural competence. Participants acknowledge that this sense of belonging significantly strengthens their connection to the practice of medicine and their commitment to serving in culturally diverse and underserved practice areas.

Keywords: Faculty-Student Mentorship Program, Osteopathic Medical Education, Diversity, Cultural Awareness

The potential compounding nature of ACEs and Diabetes on Maternal Depression:
An examination of the Behavioral Risk Factor Surveillance System

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Background: Perinatal depression (PD), defined by the American College of Obstetrics and Gynecologists (ACOG) as a depressive episode during pregnancy and up to one year after giving birth, has significant implications. ACOG recognizes that a personal history of depression, at any point in one's life, is a susceptibility factor for PD. An additional risk factor of PD is adverse childhood experiences (ACEs), which have also been linked to diabetes in adulthood. Given the potential compounding impact of ACEs and diabetes on maternal depression, the primary objective of this study is to investigate the association between any depression diagnoses among pregnant women by diabetes status in the context of ACEs.

Methods: To examine the relationship between diagnoses of depression throughout one's lifespan, among pregnant individuals with ACEs and diabetes, we performed a cross-sectional analysis using data from the Behavioral Risk Factor Surveillance System. We used a logistic regression model to examine the interaction of ACEs and diabetes on diagnosis of depression among pregnant women.

Results: Results showed that compared to pregnant without diabetes or a history of ACEs, the likelihood for depression was significantly increased among the following groups: Women with 1-3 ACEs, but no diabetes (OR: 1.81; 95%CI: 1.08-3.03), women with 1-3 ACEs and diabetes (OR: 4.06; 95%CI:1.06-15.58), 4+ ACEs/No Diabetes (OR: 5.94; 95%CI: 3.62-9.75), 4+ ACEs/Gestational Diabetes (OR: 3.04; 95%CI: 0.62-14.99), and were highest among those with 4+ ACEs/Diabetes (OR: 16.94; 95%CI:3.42-83.94). No significant difference in the rate of depression history was found in women with no ACEs having diabetes and was lower among those with gestational diabetes and no ACEs.

Conclusion: We found a significantly increased risk for maternal depression in pregnant individuals with 4+ ACEs and diabetes, demonstrating a dose-response relationship. In light of these results, obstetricians and other maternal healthcare providers should obtain a thorough social history including an ACEs questionnaire. Given the prevalence of perinatal depression, we recommend increasing access to mental health services for pregnant individuals with ACEs. Further, we recommend the promotion of protective and compensatory experiences (PACEs) during childhood to reduce the downstream effects of ACEs.

Keywords: adverse childhood experiences, perinatal depression, diabetes

The Impacts of Physiological and Socioeconomic Parameters on the Presence of Inflammatory Bowel Disease

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Background: Inflammatory bowel disease has many predisposing factors. Genetics, lifestyle, socio-economic status may all play a role. The National Health and Nutrition Examination Survey (NHANES) combines data from interviews and physical examinations from approximately 5000 people each year in the United States. It is an excellent source for acquiring nationally representative data on known inflammatory bowel disease risk factors. By its nature, survey data, such as from NHANES, frequently has missing entries. Multiple imputation provides a statistically robust way to handle missingness. Rather than discarding partially complete entries in a listwise manner, multiple imputation uses a Bayesian model to produce multiple datasets that include uncertainty on the missing data. The datasets are then re-combined to provide a complete dataset with more accurate standard errors than would be obtained by other imputation methods.

Methods: We used the R statistical programming language to download and process anonymized NHANES data from the 2009-2010 data acquisition cycle. Several parameters known or suspected to have a bearing on bowel health were analyzed. Multiple imputation was used to handle missingness in the data. Logistic regression was carried out the parameters using the presence of inflammatory bowel disease as the dependent variable.

Results: Preliminary results in this study show that individuals with inflammatory bowel disease tend to have a higher C-reactive protein, body mass index, LDL-cholesterol, triglycerides, and A1C. They also tend to have a higher monthly income and smaller family size.

Conclusion: It is important to consider the impact of both health parameters and socioeconomic parameters on bowel health. However, the differences between those diagnosed with inflammatory bowel disease and those not diagnosed should not be taken as causative. For example, while it could be the case that the lifestyle habits of people with higher monthly income predispose them to develop inflammatory bowel disease, it is also possible that those with higher income are more likely to seek medical care for their symptoms and thus be diagnosed.

Keywords: inflammatory bowel disease, Crohn, ulcerative colitis, multiple imputation, logistic regression, NHANES, R programming language

Family-Centered Care Among Children Across the United States in Patients with Sickle Cell Disease

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Background: Sickle Cell Disease (SCD) involves several red blood cell disorders affecting nearly 2,000 new babies annually and approximately 100,000 individuals in the United States. SCD requires life-long medical care and symptoms often include recurrent pain crises and early mortality. Therefore, our primary objective is to assess ratings of patient family-centered care (PFCC) among children with SCD compared to children without the disease using the National Survey of Children's Health (NSCH).

Methods: We extracted data from the 2020-2021 cycles of the survey to identify children with and without SCD and questions from modules related to PFCC. We reported the cumulative average of PFCC questions (scored between 0-4 with higher scoring equating to better PFCC) among groups and compared rates using regression analysis.

Results: We identified a sample of children (n = 53, N = 93,669) based on SCD and PFCC using the National Survey of Children's Health (NSCH) dataset. The cumulative average of PFCC for the SCD was 3.69 (SE = 0.25) and 3.59 (SE = 0.58) for those without SCD—lacking observable statistical significance in binary and adjusted regression models (Coef: 0.10; CI: -0.09-0.30 and Coef: 0.17; CI: -0.06-0.40, respectively).

Conclusion: Given there was no significant difference in cumulative PFCC scores between children with and without SCD, patient care for children with SCD is on par with the satisfaction with other children regardless of their increased care needs. However, improvements are still needed to help children with SCD receive more PFCC-focused care given other contemporary studies.

Keywords: Sickle Cell Disease, Pediatrics, Patient and Family-Centered Care

Clinical Perspective on Core Outcome Sets in Depression Trials: A Web-Based Survey Study

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Background: Depression significantly burdens the U.S population. Efforts to find the best treatment and intervention through the use of Core Outcome Sets (COS) among clinical trials is essential for mitigating the negative effects of depression on the U.S. population. COS in research refers to predefined, standardized sets of outcomes that should be measured and reported in all studies on a particular topic or condition. These outcomes help evaluate the effectiveness of interventions for depression. This study aims to explore the awareness of COS among clinical trialists engaged in depression research.

Methods: Authors of depression trials were recruited through the ClinicalTrials.gov registry. Information, including names, emails, and affiliated articles were extracted. Surveys were administered through REDCap (Research Electronic Data Capture), a secure web-based data collection tool, to collect demographics, COS familiarity, and authors' perceptions on its usefulness. Data analysis will focus on both qualitative and quantitative approaches. Quantitative data will be measured via chi-squared tests and t-tests to identify variables between demographic groups and survey responses Qualitative data will be measured through open-ended survey responses. Open-ended question responses will be independently reviewed by multiple coders to prevent bias. Both quantitative and qualitative data analysis is integral to provide a comprehensive understanding of the participants' perceptions and experiences using COS for depression trials. Ethical principles were respected due to the informed consent, anonymity, and protection of human subjects. This study has received Institutional Review Board (IRB) approval, and any modification to the protocol post-approval will be communicated to and approved by the IRB.

Results: Data collection is ongoing, with analysis yet to commence. The anticipated analysis will include: (i) descriptive statistics to summarize patient demographics and responses to close-ended questions, (ii) inferential statistics, such as chi-square tests and t-tests, to identify relationships between variables or differences among subgroups, and (iii) qualitative data, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusion: The completion of our study aims to provide new insights into clinical trialists' use and comprehension of COS in depression research. Further understanding of the COS may provide a foundation for future initiatives aimed at encouraging clinical trialists to implement COS in their research. Proper COS reporting may promote outcome standardization, potentially improving care for patients with depression.

Keywords: Depression, Core Outcome Set, Survey

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Background: Major League Baseball (MLB) pitchers place substantial stress upon their throwing elbow, leading to a high incidence of ulnar collateral ligament (UCL) injuries and reconstruction procedures. Previous studies investigating pitching metrics and player performance have demonstrated varying results. Additionally, UCL reconstruction (UCL-R) has improved over recent years. Therefore, the primary goal of this study is to evaluate differences in pitching characteristics and player performance before and after UCL-R among MLB pitchers.

Methods: A publicly available list of baseball players with confirmed UCL-R was screened by to identify MLB pitchers that underwent primary UCL-R between 2010-2021. Inclusion criteria consisted of playing at least 20 MLB games in a season, within 2 seasons of surgery, before and after UCL-R. Pitchers with multiple UCL-Rs or supplemental procedures were excluded. Included players were searched on Brooks Baseball and Baseball Reference to collect pitching and performance metrics for presurgical and postsurgical seasons. Velocity (miles per hour (mph)) and pitch selection frequency (%) for fastball, curveball, changeup, and slider were collected for pitching metrics. The following performance metrics were collected: games played, earned run average, strikeouts per nine innings (K/9), opposing batting average, opposing slugging percentage, and swinging strike percentage. If data was normally distributed with similar variance, a t-test of dependent samples was used to compare differences in means. If normality of variance assumptions were violated, we used a Wilcoxon signed rank test to compare dependent samples.

Results: Based on our inclusion criteria, 80 MLB pitchers were included for analysis. Sample sizes for pitch types varied (Table 1). UCL-R was associated with a significant decrease in fastball velocity (mean difference -0.54 mph, p < 0.001, d = 0.4) and fastball frequency (mean difference -5.9%, p < 0.001, d = 0.54), with a medium effect size for both variables. Curveball velocity was also significantly decreased with a moderate effect size (median difference -0.25 mph, p = 0.028, r = 0.37). K/9 significantly decreased with a small effect size (mean difference -0.52, p = 0.024, d = 0.26) (Table 2). UCL-R had a small and nonsignificant effect on the number of games played and slider frequency.

Conclusion: This study found that MLB pitchers who underwent UCL-R and returned to play at the same level demonstrated a significant decrease in fastball and curveball velocity. These pitchers threw significantly fewer fastballs and had a significantly lower K/9. These findings should encourage pitchers to take necessary precautions to avoid overuse injury to their throwing elbow, while also providing sports medicine professionals with updated information to counsel pitchers on expectations following UCL-R. It is important to note that this study was observational, therefore, does not support causation. Additionally, the various surgical approaches, techniques, and opinions related to UCL-R and postoperative rehabilitation, which are continuously evolving, potentially influences results among various cohorts. Due to varying results from previous studies, clinical investigations focusing on surgical and rehabilitative characteristics are warranted to further establish key factors for player success and safety.

Keywords: UCL Surgery; UCL Repair; Tommy John Surgery; MLB; velocity; performance

Clinical Perspective on Core Outcome Sets in Stroke Trials: A Web-Based Survey Study

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Background: Clinical trials are fundamental for advancing medical knowledge, and Core Outcome Sets (COS) serve as a vital tool for reducing variability and in standardizing outcome measurements across various areas of research. Given the widespread prevalence and profound consequences of strokes as the second leading cause of death globally, integrating COS in stroke clinical trials holds promise for more beneficial and efficacious interventions. This study aims to explore the adoption of COS within the stroke research community, identifying limitations and avenues for improvement. The insights gained will guide future efforts to enhance the understanding and applicability of stroke clinical trials.

Methods: The participants comprised of clinical trial professionals who have been involved in stroke trials over the past five years. Investigators reached out to participants via email to distribute a comprehensive web-based survey. The survey, conducted via REDCap, will gather demographic information and assess participant familiarity with COS in stroke clinical trials. The selection of COS was informed by the Core Outcome Measures in Effectiveness Trials (COMET) Initiative database. The survey will be open for responses for a duration of eight weeks, with bi-weekly reminders sent via email to encourage participation. Participants will be required to provide informed consent before commencing the survey.

Results: Data is currently in the collection phase of this study. Analysis of survey responses will include: (i) descriptive statistics to summarize patient demographics and responses to close-ended questions, (ii) inferential statistics, such as chi-square tests and t-tests, to identify relationships between variables or differences among subgroups, and (iii) qualitative data, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusion: Upon completion of this endeavor, our data will not only provide new insights into how clinical trialists use and understand COS, but also may serve as the foundation for future initiatives and interventions. These efforts will be aimed at encouraging stroke clinical trialists to integrate COS into their research practices. The resulting outcomes have the potential to promote standardization in the reporting of clinical COS, ultimately enhancing patient outcomes pertaining to stroke patients.

Keywords: Stroke, Clinical Trials, Core Outcome Sets

Potential Medicare and Medicaid Savings for Dermatologic Drugs by Adopting the Mark Cuban Cost Plus Drug Company Model

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Introduction: The United States grapples with a persistent challenge of escalating national healthcare expenditure, projected to rise by five percent in 2024 and nearly six percent for 2025-2031. Amidst concerns about the growing healthcare costs, especially prescription drugs, this study explores the potential cost-saving impact of the Mark Cuban Cost Plus Drugs Company (MCCPDC), an innovative online pharmacy. Focusing on dermatological drugs, crucial for conditions affecting millions, the study aims to assess MCCPDC's pricing model against established programs like Medicare and Medicaid.

Methods: The study adopts a cross-sectional analysis, adhering to Consolidation Health Economic Evaluation Reporting Standards (CHEERS). The comparison involves 29 hair and skin drugs available on the MCCPDC website with 2021 Medicare Part D and Medicaid spending data. The analysis considers potential savings by adopting MCCPDC prices and employs unit prices, dispensing fees, and shipping costs for comparison.

Results: The study reveals substantial potential savings, estimating $214.7 million for Medicare and $49.7 million for Medicaid if MCCPDC prices were adopted. Individual drug analysis highlights significant reductions, with Fluticasone Propionate demonstrating the highest potential savings.

Discussion: MCCPDC's pricing strategy could revolutionize dermatology, offering substantial cost reductions and improved accessibility. The study emphasizes its potential impact on patient adherence, particularly for conditions like atopic dermatitis, and extends the benefits to preventative medicine, lowering long-term healthcare costs. While challenging traditional pharmaceutical profit margins, MCCPDC incentivizes cost-efficient drug development, promoting sustainability and efficiency in the industry.

Keywords: Dermatology, Economics, Medicare, Medicaid, Cost Plus Drug Company

A genomic investigation of Lactic Acid Bacteria-derived biosynthetic gene clusters reveals therapeutic potential of a novel *Lactobacillus* species

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Background: Amidst the escalating challenges of gut dysbiosis and antibiotic resistance, the exigency for research on 1) beneficial microbes to help positively shape the gut microbiome, and 2) alternative antimicrobials to combat bacterial pathogens, has reached critical levels. Lactic Acid Bacteria (LAB), celebrated for their prolific probiotic potential, offer a solution to both of these problems. Generally recognized as safe (GRAS), a status issued by the U.S. Food and Drug Administration, LAB are currently permitted for use in the food industry as biopreservatives and live probiotics, in agriculture as feedstock and alternatives to chemical pesticides, and in pharmaceutical applications for antimicrobial properties, production of bioactive compounds, and their role in drug delivery systems.

Methods: By employing a culturomics approach in conjunction with advanced anaerobic techniques, we have isolated a novel species belonging to the genus *Lactobacillus*, with 97.5% similarity to its nearest phylogenetic neighbor (new species cutoff value is < 98.3% nucleotide similarity based on 16S rRNA gene sequencing). *In silico* analysis of the whole genome has revealed a number of biosynthetic gene clusters implicated in probiotic traits, suggesting our full phenotypic characterization will yield many avenues for commercialization.

Results: Genomic mining of this nascent species has brought to light several compelling areas of interest, particularly with respect to bacteriocin production. Genes homologous to core structural proteins of known antimicrobials were found using computational programs such as BAGEL4 and antiSMASH, suggesting this isolate is capable of killing known human pathogens such as *Clostridioides difficile* and *Staphylococcus aureus*. Current literature also suggests that closely related members of this clade exhibit anti-inflammatory, immunomodulatory, and intestinal barrier protection in animal and human models, thus warranting further investigation into this isolate's versatility in healthcare applications.

Conclusions: Owing to the promising outcomes from preliminary *in silico* work, a more comprehensive investigation into this novel species will be performed to characterize its full antimicrobial spectrum and expose the transformative innovations it harbors.

Keywords: Microbiome, Genome, Probiotic

Identifying Interventions for Recruitment of Women into Medical Residency Programs: A Scoping Review

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Scope and Objective: Diversity, equity, and inclusion continues to be an important topic in medicine and has gained increased attention in the last decade. Matriculating medical school classes have shown equal gender distribution since 2013, yet significant discrepancies among certain medical residencies persist. We investigated several specialties and their interventions to increase gender diversity in effort to increase representation of female residents.

Methods: Literature search was conducted in the following databases: PubMed, Scopus, Embase and Web of Science. Included studies were systematic reviews, meta-analyses, scoping reviews, retrospective database reviews, clinical trials, literature reviews, case-control studies, cross-sectional analyses, and cohort studies, between the years 2018-2023, and conducted within the United States. The data was imported into Rayaan, and two independent investigators screened records for inclusion criteria in a masked, duplicate fashion. Investigators then completed a data extraction form that identified the intervention used. The initial database search yielded 1,663 articles, and 29 met inclusion criteria.

Results: The majority of the articles discussed program faculty or staffing changes, followed by mentorship and increased medical student exposure. Of the included studies, 86.2% demonstrated a positive influence on female recruitment when interventions were implemented.

Conclusions: Although achieving gender equality in medical specialties remains an ongoing challenge, we have identified interventions that guide us towards progress. Equal representation of women among all medical specialties is vital for improved patient care and diverse perspectives, therefore, continuing to evaluate and implement interventions to improve equality is needed.

Keywords: gender diversity, female representation, interventions, residency education

Alcohol consumption among older adults in the United States amidst the COVID-19 pandemic: An analysis of the 2017-2021 BRFSS

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Background: Alcohol consumption is responsible for numerous life-threatening diseases, including liver cirrhosis, heart disease, and various cancers. During the pandemic, alcohol related deaths increased from 2019 to 2021, topping out around 108,000 deaths related to alcohol. This trend introduced the question if heavy alcohol consumption and binge drinking increased during the pandemic as well, particularly in those 65 and older.

Methods: We performed a cross-sectional analysis of the Behavioral Risk Factor Surveillance System (BRFSS) to determine whether rates of overall alcohol consumption, heavy consumption, or binge drinking deviated from 2017 through 2021. We used X^2 tests to determine changes in rates over the included years.

Results: Our findings showed the overall rate of alcohol use in populations 65 and older during 2017-2021 was approximately 42.3% which peaked in 2017 at 43.72% and declined each year resulting in the lowest rate (41.26%) in 2021 (X2 = 8.96, P<.0001). Binge and heavy drinking rates were 5.10% and 4.23% across years, respectively, and annual changes were not statistically significant.

Conclusion: The impact of COVID on drinking behavior of older US adults seemed to be minimal in terms of binge or heavy drinking, while overall rates of alcohol consumption among this group declined. Reports among other US age groups showed increased consumption and deaths from alcohol use. Future research is needed to determine causes for the overall decrease in consumption or adaptive measures this group may have taken which led to minimal changes in binge or heavy drinking in contrast to younger populations.

Keywords: alcohol consumption, older adults, COVID-19

Exploring Emergency Department Wait Times for Individuals with Alcohol Use Disorder with +/- Elevated Blood Alcohol Concentration

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Introduction: As of 2021, 29.5 million U.S. people ages 12 and older have been diagnosed with Alcohol Use Disorder (AUD), an increase from 15.7 million reported cases in 2015. As the prevalence of AUD continues to increase, healthcare providers must anticipate alcohol-associated admissions due to increased chronic disease and premature mortality.

The Emergency Department (ED) is the most used point of entry into the healthcare system for patients experiencing a traumatic injury and one of the most common admission sites for patients with AUD. AUD is consistently regarded as one of the most stigmatized disorders globally, which provides a major barrier for those seeking medical treatment. Given the increased likelihood of staff experiencing individuals in the ED with AUD or a positive blood alcohol content (BAC) test, identifying potential barriers of individuals with AUD seeking care in the ED may improve overall hospital care outcomes. Thus, the primary objective of our study was to evaluate the potential effects of having an AUD diagnosis on wait times during admission to the ED. Therefore hypothesized that those with AUD+/BAC+ will have longer wait times than those who are AUD-/BAC-.

Methods/Materials: We conducted a cross-sectional analysis of the 2021 National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset that reports Emergency Departments (ED) admissions in the United States. Each ED is randomly assigned a 4-week reporting period in which there is a random collection of patient data and characteristics. Each hospital was trained in data collection, verified for eligibility and aided in creating a collection plan prior to participation in the survey. After calculating mean wait times for each sociodemographic of our sample, we assessed differences in these wait times using binary and multivariable linear regression models.

Results: Results from our binary regression showed that compared to individuals with no history of alcohol misuse and were BAC negative, we found that individuals who were AUD-/BAC+ had a shorter wait time (min -18.43, SE = 1.92, t = -9.59, P <.001). Additionally, those who were AUD+/BAC+ had shorter wait times compared to AUD-/BAC- as well (min = -11.11, SE = 4.05; t = -2.75, P = .006). In our adjusted model, only those with AUD-/BAC+ significantly differed from the reference group—having a 16.7 minute shorter wait time on average (SE = 2.97; t = -5.62, P <.001) compared to the AUD-/BAC- group.

Discussion/Conclusions: Overall, our study showed no significant difference in emergency department wait times between individuals with and without a history of AUD, although those presenting under the influence of alcohol had shorter wait times. This shows that whether or not AUD-related stigma exists in EDs, it does not negatively affect the timeliness of when an individual with AUD is seen by a doctor. We still recommend training for ED physicians, healthcare workers, and staff to identify and mitigate implicit bias to continue to remove barriers to treatment and improve patient care amongst all populations.

Keywords: Alcohol Use Disorder, Stigmatization, Emergency Department, Wait times

Quantifying Public Interest in Merkel Cell Carcinoma in the United States Following the Death of Jimmy Buffett and Implications for Continued Health Advocacy

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Background: September 01, 2023, marked the loss of iconic singer-songwriter Jimmy Buffett after a lengthy battle with lymphoma precipitating from the non-melanoma skin cancer, Merkel cell carcinoma (MCC). MCC is an aggressive non-melanoma skin cancer with high metastatic potential, often resulting in poor prognoses and a significant cause of skin cancer-related deaths. Given Buffett's prominent status, media coverage of his death was extensive. Thus, our objective was to quantify public search interest in skin cancer, MCC, and related risk factors before and after Buffett's death, with the objective of emphasizing the influence public figures and subsequent media coverage have on public health-related topics.

Methods: Relative search interest (RSI) data from Google Trends was used to perform a temporal analysis. We extracted (RSI) for search terms "skin cancer," "Merkel cell carcinoma," and "health effects of sunlight exposure" in the United States from August 02, 2023 through September 30, 2023. Auto-regressive integrated moving algorithm (ARIMA) models were constructed to forecast RSI if Buffett's death had not occurred, based on 30 days prior. Actual RSI was compared to forecasted trends in RSI during analysis.

Results: Our study found that search interest for "skin cancer", "Merkel cell carcinoma", and "health effects of sunlight exposure" significantly increased among US users following the announcement of Buffett's death. Peaks in RSI occurred two to three days following his death, correlating with major news outlets' reporting of the event. Notably, RSI values for 'skin cancer' and 'Merkel cell carcinoma' saw 1,059.42% and 21,968.97% increase, respectively, above expected values. 'Health effects of sunlight exposure' exhibited a 95.79% surge.

Conclusion: Through Jimmy Buffett's unfortunate battle with lymphoma originating from Merkel cell carcinoma and subsequent media coverage of his death, public interest in skin cancer, Merkel cell carcinoma, and the health effects of sunlight exposure increased as evidenced by our results. Increased public interest in such topics may advance MCC screening and treatment aimed at mitigating unmet medical needs. It is also crucial to address challenges related to sustainability of disseminating accurate information related to health behaviors to the public.

Keywords: skin cancer, Merkel cell carcinoma, health effects of sunlight exposure, public interest, Jimmy Buffett

Exploring Emergency Department Wait Times for Individuals with Alcohol Use Disorder with +/- Elevated Blood Alcohol Concentration

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Introduction: As of 2021, 29.5 million U.S. people ages 12 and older have been diagnosed with Alcohol Use Disorder (AUD), an increase from 15.7 million reported cases in 2015. As the prevalence of AUD continues to increase, healthcare providers must anticipate alcohol-associated admissions due to increased chronic disease and premature mortality.

The Emergency Department (ED) is the most used point of entry into the healthcare system for patients experiencing a traumatic injury and one of the most common admission sites for patients with AUD. AUD is consistently regarded as one of the most stigmatized disorders globally, which provides a major barrier for those seeking medical treatment.Given the increased likelihood of staff experiencing individuals in the ED with AUD or a positive blood alcohol content (BAC) test, identifying potential barriers of individuals with AUD seeking care in the ED may improve overall hospital care outcomes. Thus, the primary objective of our study was to evaluate the potential effects of having an AUD diagnosis on wait times during admission to the ED. Therefore hypothesized that those with AUD+/BAC+ will have longer wait times than those who are AUD-/BAC-.

Methods/Materials: We conducted a cross-sectional analysis of the 2021 National Hospital Ambulatory Medical Care Survey (NHAMCS) dataset that reports Emergency Departments (ED) admissions in the United States. Each ED is randomly assigned a 4-week reporting period in which there is a random collection of patient data and characteristics. Each hospital was trained in data collection, verified for eligibility and aided in creating a collection plan prior to participation in the survey. After calculating mean wait times for each sociodemographic of our sample, we assessed differences in these wait times using binary and multivariable linear regression models.

Results: Results from our binary regression showed that compared to individuals with no history of alcohol misuse and were BAC negative, we found that individuals who were AUD-/BAC+ had a shorter wait time (min -18.43, SE = 1.92, t = -9.59, *P* <.001). Additionally, those who were AUD+/BAC+ had shorter wait times compared to AUD-/BAC- as well (min = -11.11, SE = 4.05; t = -2.75, *P* = .006). In our adjusted model, only those with AUD-/BAC+ significantly differed from the reference group—having a 16.7 minute shorter wait time on average (SE = 2.97; t = -5.62, *P* <.001) compared to the AUD-/BAC- group.

Discussion/Conclusions: Overall, our study showed no significant difference in emergency department wait times between individuals with and without a history of AUD, although those presenting under the influence of alcohol had shorter wait times. This shows that whether or not AUD-related stigma exists in EDs, it does not negatively affect the timeliness of when an individual with AUD is seen by a doctor. We still recommend training for ED physicians, healthcare workers, and staff to identify and mitigate implicit bias to continue to remove barriers to treatment and improve patient care amongst all populations.

Keywords: Alcohol Use Disorder, Stigmatization, Emergency Department, Wait times

Advancing Dermatologic Research: The Role of Network Meta-Analysis in Improving Treatment Comparisons

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Dermatologic research is essential for advancing our understanding of skin conditions and improving patient outcomes. The field is characterized by a diverse range of disorders, each with unique challenges in terms of diagnosis and treatment. As clinicians and researchers strive for evidence-based practices, they encounter limitations in the form of limited head-to-head trials, heterogeneity in study designs, and variations in outcome measures. In light of these challenges, network meta-analysis (NMA) emerges as a promising methodology to address the limitations of traditional meta-analysis in dermatologic research. NMA extends beyond the constraints of conventional meta-analysis by allowing the simultaneous comparison of multiple treatments, even in the absence of direct head-to-head trials. NMA aids in systematically ranking treatments based on efficacy, safety, and tolerability, providing clinicians with a refined approach to personalized treatment plans. As a result, this paper discusses what a network meta-analysis is and its place within the dermatologic literature while discussing practical considerations and limitations. As more high-quality evidence becomes available, the application of NMA in dermatology is expected to grow. Future research should focus on refining NMA methodologies, addressing data quality concerns, and exploring innovative ways to incorporate patient preferences into treatment rankings.

Keywords: Network Meta-analysis, Dermatologic Literature, Methodology, Patient Care

A Survey of the Perceptions, Knowledge, and Utilization of Core Outcome Sets in Parkinson's (PD) Trials: A Cross-Sectional Study

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Background: Parkinson's Disease (PD) is a neurodegenerative condition affecting more than 10 million individuals globally, with an increasing annual incidence and profound, multifactorial consequences. Quality medical decision-making for PD patients is guided by clinical trials. Given the importance of clinical trials, Core Outcome Sets (COS) were created to provide standardized recommendations for trial measurements so trial efficacy could be more accurately compared. However, the PD COS have been poorly implemented in clinical trials since its publication in 2018. As funding for PD research increases, it becomes increasingly critical to comprehend the factors impacting the adoption of PD COS, ensuring the supported research holds clinical significance. This cross-sectional study aims to identify these factors by gathering trialists' insights in a web-based survey. Our primary objective is to gain a more robust understanding of trialists' perception, awareness, and experience with the current PD COS to identify its implementation barriers.

Methods: In a previous study, we extracted clinical trial measurement tools from PD trials before and after COS publication to evaluate PD COS uptake. For this study, we screened this set of trials to include clinical trialists who have participated in the design, implementation, or analysis of PD trials within the past five years. We then extracted the contact information of 1000 trialists to serve as survey recipients. The survey is designed to be comprehensive and will consist of a set of 20 questions. Participants will have informed consent and maintain complete anonymity. The participants' familiarity with the COS will determine their navigation through the survey. Surveys will be developed and distributed to trialists via REDCap (Research Electronic Data Capture), a secure web-based application designed for research data collection. Data analysis may include both descriptive and inferential statistics. Qualitative data will also be obtained from open-ended questions.

Results: Data is currently in the collection phase of this study. Analysis of survey responses will include:

(1) Descriptive statistics: summarizes patient demographics and responses to close-ended questions. (2) Inferential statistics: examples include chi-square tests and t-tests which may be used to identify relationships between variables or differences among subgroups. (3) Qualitative data: derived from responses to open-ended questions, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusion: Upon completion of this project, our data will inform us of the use and knowledge of COS by clinical trialists. The insight gained from this study may serve as a foundation for future initiatives and interventions aimed at enhancing the utilization of COS among clinical trialists. These outcomes may promote uniformity in clinical COS reporting, ultimately, improving patient outcomes with PD.

Keywords: Parkinson's Disease, Clinical Trials, Core Outcome Sets

Phenotypic and proteomic analysis of a Chlamydomonas mutant, *shf1*, defective in flagellar assembly

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Introduction/Objectives: Cilia and flagella are essential for human health. Defects in the assembly and function of these organelles are associated with a collection of disorders called ciliopathies. Studies have suggested that regulation of ciliary size is associated with external environmental factors. Although TOR signaling pathway has recently been implicated as playing a pivotal role in linking the cellular environment with determination of cell and organelle size, additional biological pathways involved in this process remain largely unknown. To learn more about these pathways, we undertook a phenotypic and proteomic analysis of a mutant defective in assembling full-length flagella, *shf1*. These mutants assemble flagella that are half the length of wildtype. Interestingly, the flagella of these mutants are unstable in the presence of acetate.

Methods: Wildtype and *shf1* cells were grown to equal density on a 12-hour light/dark cycle. Flagella and cell body sizes as well as acetate-induced changes were determined by microscopic analysis. Quantitative proteomic analysis was performed using label-free methods and analyzed using MaxQuant software. Statistical analysis was performed using two-tailed student's t-test to identify proteins whose levels varied between wildtype and *shf1* cell bodies and isolated flagella.

Results: As previously shown, *shf1* cells assembled flagella that were half the length of wildtype cells. Surprisingly, the cell body volume of *shf1* was increased up to twice that of wildtype. The inclusion of acetate in the media resulted in aflagellate *shf1* cells and cells were seen to lose flagella within 30 minutes of addition of acetate. Proteomic analysis on isolated cell bodies and flagella identified 4,943 and 3,169 proteins, respectively. Preliminary analysis of the proteomic data demonstrated that 4% of the cell body proteins were present at levels that differed in a statistically significant manner. Similarly, a statistically significant difference in protein levels was seen for 9.8% of flagellar proteins.

Conclusions: Although *shf1* assembles short flagella, their cell bodies are approximately twice the size of wild-type cells. This suggests that regulation of flagellar length and cell body size are coupled together. As originally reported, inclusion of acetate in growth media results in the absence of *shf1* flagella. These results suggest that acetate induces instability of the *shf1* flagella leading to flagellar disassembly. Our preliminary data suggest that *shf1* and wildtype cells have significant differences in protein composition and levels. Currently, we are examining the proteins that are statistically different between these two strains to learn more about the pathways regulating flagellar assembly and function.

Keywords: Chlamydomonas, cilia/flagella, proteome

Implementation of 2023 Pediatric Obesity Guidelines in a Pediatric Residency Clinic Setting

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Introduction/Objectives: Approximately 14.4 million U.S. children are diagnosed with obesity. The prevalence of pediatric obesity in Oklahoma is 29.5%, ranking Oklahoma 18th overall for overweight and obese pediatric patients. Pediatric obesity is associated with multiple serious co-morbidities if left untreated, including cardiovascular disease, diabetes, hyperlipidemia, mental health issues, musculoskeletal disorders, neurological disorders, and sleep apnea. In February 2023, the American Academy of Pediatrics published updated guidelines on the evaluations and treatment of pediatric obesity. New guidelines emphasize enhanced screening and early intervention rather than watchful waiting. Objective for this project was to determine how best to implement the new guidelines in a pediatric residency outpatient clinic training program, with an emphasis on obtaining a comprehensive medical history.

Methods: This project was performed in conjunction with the American Academy of Pediatrics Institute for Healthy Childhood Weight's "Assessment & Evaluation of Childhood Obesity QI Project." Four rounds of data collection were performed. In each round, 30 random charts were reviewed (20 from well child checks with a diagnosis code associated with overweight or obesity and 10 from all well child checks). Charts were evaluated for obtaining a complete history, screening for comorbidities, and establishing an appropriate treatment plan. After round one of collection data, a review of electronic health record (EHR) templates for well child checks to determine if inquiry into documenting the five components of a complete history were intuitive. After review of templates, changes were made in attempts to make documenting more efficient.

Results: In the initial round of data collection, it was noted that physicians at the clinic in question obtained a complete history 30% of the time. For example, instead of inquiring about social determinants of health (SDoH), nutrition, physical activity, screen time and sleep; physicians might inquire about only food insecurity and screen time, but not all 5 components. After review and editing of EHR templates, documentation of a complete history improved to 75%.

Conclusions: On initial review of data, it was discovered that physicians within the clinic only obtained a complete history, per the 2023 obesity guidelines, 30% of the time. There was an initial increase then a subsequent decrease in history completion. During this time, senior residents graduated, and a new group of interns came into the practice. After editing EHR templates, complete medical histories were obtained 75% of the time. Making templates more intuitive allowed for more consistent obtaining of comprehensive medical histories. This is particularly important in residency training programs with yearly turnover. Now that comprehensive medical exams are routinely obtained, next steps include increasing initiation of a patient and family centered treatment plan [including Intensive Health Behavior and Lifestyle Treatment (IHBLT)] and improved follow up within 4 weeks of obesity diagnosis.

Keywords: Obesity, Pediatric, Primary Care

Disparities in Medical Home Access for Children with Arthritis

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Introduction: Patient-centered medical home models include comprehensive care tailored to individual needs by focusing on values and culture, coordinating services between caretakers, offering accessible services, and using evidence-based medical practices. Access to medical home care is correlated with increased preventative care, less unmet health and family support needs, and increased use of community-based services. This model can be used to evaluate disparities in the treatment of chronic illnesses like childhood arthritis. Thus, our objective was to assess rates of children with arthritis and their access to medical homes.

Methods: We conducted a cross-sectional analysis of the National Survey of Children's Health using data from the 2016-2021 cycles. Survey design and sampling weights, provided by the NSCH, were adjusted to account for multiple data cycles. First, we reported the sample prevalence and population estimate of children having arthritis in the United States. Then we assessed sociodemographic disparities among children with arthritis meeting medical home criteria.

Results: There were 560 (0.24%) children within the sample of 223,341 participants who had a current diagnosis of arthritis. Among children with arthritis, 30.5% had access to a medical home while 47.77% of children without arthritis had access to a medical home—a significant difference (OR: 0.48; 95%CI: 0.36-0.65). Children who were reported as white and also reported had a current arthritis diagnosis were more likely to be in a medical home when compared to children reporting as Black (OR: 0.27; 95% CI: 0.11-0.69), Hispanic (OR: 0.22; 95% CI: 0.08-0.5), or other minority groups (OR: 0.29; 95% CI: 0.1-0.84) respectively. Medical home access increased with increased adult educational attainment—which was statistically significant. Furthermore using 0%-99% of the federal poverty income as our reference, there was increased access to medical homes for children with arthritis and 100%-199%, 200%-399%, and 400%+ of the federal poverty level with odds ratios of 8.52 (95% CI: 3.01-0), 4.09 (95% CI: 1.57-0), and 5.13 (95% CI: 2.22-0), respectively. Associations between medical home access and neither metropolitan statistical area nor arthritis severity were statistically significant.

Conclusion: Upon evaluation of medical home access for children with arthritis, not only did we find that children with arthritis were significantly less likely to be in a medical home compared to children without arthritis, but we also found significant disparities within the sample of children with arthritis among ethnoracial groupings, parental educational attainment, and household income level. These sociodemographic disparities are common among most child groups, further research into factors influencing disparities is warranted to increase evidence-based interventions and resources. Conversely, no significant associations were found between medical home access and arthritis severity nor among rural areas—the latter of which is often noted as a difficult barrier to overcome for medical access.

Keywords: arthritis, medical home, access

The use of different imaging modalities in acute abdominal pain in pregnancy

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Background and Purpose: Abdominal pain during pregnancy is quite common with a wide differential diagnosis including both obstetric and non-obstetric pathologies. Diagnostic imaging modalities used in addition to history and physical examination (PE) are often ultrasound (US) and magnetic resonance imaging (MRI). We sought to find the role of these tests in pregnant patients who presented to our emergency department with acute abdominal pain. Previous studies examined the efficacy of MRI as a first diagnostic imaging modality in the setting of acute abdominal pain in pregnancy concerning for acute appendicitis without conclusive objective findings.

The objective of this study is to determine the ability of ultrasound and physical exam findings in correctly identifying renal or hepatobiliary pathology in pregnant patients presenting with acute abdominal pain compared to the use of MRI.

Materials And Methods: This is a retrospective analysis of 136 pregnant women with acute abdominal pain who presented to the emergency department (ED) at Ascension Genesys Hospital, Grand Blanc, MI. PE, US, MRI, gestational age, comorbid conditions, and length of stay were reviewed. Statistical analysis was done using T-test and chi-square test. Institutional review board approval was obtained.

Results: Our study found that the mean age was 26.8 (±5.4) years and the mean gestational age was 16.5 (±8.4) weeks. Of those patients, there were 59 patients who had an US and 47 with subsequent MRI performed. The US demonstrated abnormal findings in 8 patients for renal or hepatobiliary pathology; 2 patients demonstrating cholelithasis, 1 demonstrating choledocholithasis, 1 with "prominent biliary sludge and small stones," and 4 with mild to moderate hydronephrosis. The MRI demonstrated abnormal findings in 11 patients; 7 with mild to moderate hydronephrosis, with 1 commenting on "mild perinephric fluid, with the middle 1/3 R ureter compressed between the enlarged gravid uterus and psoas muscle", 1 with choledochal cyst, 1 with cholelithasis, 1 with cholelithasis and stricture of common bile duct, and 2 with hepatic lesions. Of those patients, 3 underwent a procedure for their acute pain including biliary stent placement, ERCP, and cystoscopy with ureteral stent placement. Of those 3 patients who underwent surgical procedure, all had abnormal US confirmed with abnormal MRI.

Conclusion: Previous studies have demonstrated that in the setting of acute abdominal pain in pregnancy and positive PE highly suggestive of surgical pathology, especially in the setting of RLQ pain and suspicion for appendicitis, US had limited value and patients should proceed to MRI. This data suggests that US is an appropriate step in work up with gravid patients with acute abdominal pain. Ultrasound is a cost effective and reliable screening tool for renal or hepatobiliary pathology that is safe during pregnancy. The determination for if an MRI is necessary should be based on clinical suspicion and provider preference. Ultimately the decision for surgical intervention should be determined by clinical suspicion. Further studies would benefit from a higher power.

Clinical Perspective on Core Outcome Sets in Type 1 Diabetes Trials: A Web-Based Survey Study

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Background: Type 1 diabetes (T1DM) affects nearly 1.9 million individuals in the United States, necessitating daily interventions with an annual cost exceeding $16 billion. Managing T1DM is complex, requiring personalized regimens based on clinical trial findings. Challenges arise from inconsistent outcome measurements across medical domains, prompting a solution:the use of a core outcome set (COS) to standardize measurements and reporting, thus reducing bias. In this cross-sectional study we employ a web-based survey to explore how current COS are understood and applied in T1DM trials. The primary objective is to gather insights from those conducting trials, assessing the current state of COS adoption, and identifying potential areas for improvement. The findings aim to clarify awareness, attitudes, and practices related to the current COS in T1DM research, providing insights for future strategies to enhance COS usage and improve the quality and comparability of T1DM trial outcomes.

Methods: In a previous study, we assembled a sample of trials to assess the adoption of the COS for T1D. For this survey, eligible participants are clinical trialists who have been involved in the design, implementation, or analysis of T1D trials within the last five years. The survey is designed to be comprehensive, comprising a set of 20 questions. Participants will provide informed consent, and their responses will be kept confidential and anonymous. The participants' familiarity with the COS will influence the progression of their survey. We will create and distribute the surveys to trialists using REDCap (Research Electronic Data Capture), a secure web-based application designed for research data collection. Data analysis may involve both descriptive and inferential statistics, and qualitative data will be gathered through open-ended questions.

Results: The data is presently in the process of being collected, encompassing descriptive statistics, inferential statistics, and qualitative data. Patient demographics and responses to closed-ended questions will be summarized through descriptive statistics. Inferential statistics, such as chi-square tests and t-tests, will be employed to identify relationships between variables or differences among subgroups. Additionally, qualitative data will be obtained from responses to open-ended questions and subjected to thematic analysis to identify recurring themes and patterns.

Conclusion: Upon the culmination of this project, our data will provide valuable insights into the utilization and awareness of the core outcome set (COS) among clinical trialists in the realm of Type 1 Diabetes (T1D). The findings from this study could establish a basis for future initiatives and interventions geared towards enhancing the incorporation of COS among clinical trialists involved in T1D research. These outcomes may contribute to the standardization of clinical COS reporting, ultimately leading to improved patient outcomes within the context of T1D.

Keywords: Type 1 diabetes, Core Outcome Sets, Clinical trials

A Systematic Review of Gender Representation in Neuroimaging Research in Drug Abuse Populations

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Introduction/Objectives: Gender and race disparities in research participation have long plagued fields of biomedical research. These disparities limit the generalizability of research findings and can further perpetuate health disparities for marginalized groups. One such area that is significantly limited by a lack of sample diversity is clinical substance abuse research. A growing body of evidence suggests gender differences in substance uptake, withdrawal, response to medication treatments, and neurocognitive effects. However, there is a marked lack of research further investigating these supposed differences, particularly for non-alcohol drugs of abuse. In the current study, we intended to assess the extent of this issue in neuroimaging studies by systematically reviewing neurocognitive-based drug abuse research. Further, we wished to identify any preliminary gender-based trends in this body of literature.

Methods: The database search was conducted on April 25, 2023, in MEDLINE (via PubMed), PsychInfo, and Embase. The search strings used were designed to be broad and were intended to identify original research studies using neuroimaging techniques to assess cognitive functioning in substance users. The resulting articles were screened in a masked, duplicate fashion, with disagreements being resolved through discussion. Data was later extracted from included articles in a similar fashion with discrepancies being resolved by a third researcher. All procedures were conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Results: Out of the 22,403 studies yielded by our initial search, 154 studies met the inclusion criteria. We found a notable lack of female participants across the included studies, with women only representing 22.77% of participants. As such, gender proportions within individual studies were often skewed towards men, with only 24.0% of the included studies having a roughly equal or higher percentage (operationalized as a $\geq$40% female sample) of female participants. For some drug types, such as cocaine, these proportions were even lower with only 17.24% of studies meeting the $\geq$40% female participant threshold. Furthermore, nearly a quarter of the studies did not include any women in their samples. Likewise, few studies performed gender-based data analyses, with 11 of these reporting some type of significant gender difference. However, no major conclusions about neurological gender differences within the context of drug use could be made in the current study due to heterogeneity in study characteristics.

Conclusions: We identified a clear gender disparity in imaging-based drug use research participation. Significant efforts by researchers and research institutions must be made in order to expand this body of knowledge. Further, increased exploration into the underlying gender differences of addiction can be used to better inform clinical interventions, possibly leading to improved outcomes for women with substance use disorders.

Keywords: substance abuse, neuropsychology, health disparities

Method Optimization for recombinant protein production

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Introduction: Recombinant proteins are highly desirable for treating many blood coagulation disorders. They pose fewer risks than plasma-derived proteins. Production of recombinant proteins in mammalian cells (HEK293) is a delicate and lengthy process.

Aim: To optimize cell culture techniques and increase the yield of recombinantly prepared proteins.

Method: The optimized methods for protein expression, purification, and characterization involved several steps including protein transfection, stable cell line generation, purification using Q-Sepharose, and utilization of an FPLC machine. The transfection technique involved introducing the target plasmids into the cells using various transfection methods such as lipofection. The transfection process ensured that the desired proteins were expressed in the cells for subsequent analysis. The generation of a stable cell line ensured consistent expression of the target proteins, providing a reliable source for subsequent experiments. The ion exchange technique allowed for the separation and purification of the target proteins from the conditioned media, reducing background interference and enriching the protein of interest. The Q-Sepharose column, through its ion exchange properties, selectively bound the target proteins while allowing contaminants to flow through. The FPLC machine utilized a size-exclusion chromatography technique, which enabled the resolution of complex protein mixtures and the detection of target proteins with high sensitivity.

Result: In the current study and utilizing optimized methods, we purified and characterized several novel proteins and variants including VWF, ADAMTS13, ADAMTS7, and variants (D4, 3AE, 3A, D4-CK, FQ, Q2). The protein transfection technique allowed for the efficient delivery of target proteins into the cells, while the creation of stable cell lines ensured their consistent expression. Additionally, the purification process using a Q-Sepharose column enabled the isolation of the desired proteins with high specificity. Lastly, the FPLC machine facilitated the separation and analysis of the purified proteins.

Conclusion: Several novel coagulation proteins were prepared and characterized using optimized methods. They will be used for subsequent experiments.

Keywords: VWF, ADAMTS7, ADAMTS13, Transfection, Stable cellline, Recombinant

Physical activity in rural vs urban areas in northeast Oklahoma: A study of 5K participation

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Introduction/Objectives: Physical activity is one of the most important strategies for preventing and managing diseases such as diabetes, heart disease, and osteoporosis as well as reducing all-cause mortality. Still, physical activity remains a health challenge, especially in rural communities. Residents of rural communities have fewer opportunities for physical activity participation, lower odds of meeting physical activity guidelines, and a lower overall health status when compared to their urban counterparts. The development and adaptation of evidence-based interventions for physical activity promotion in rural communities is an essential strategy to address physical activity inequities. The aim of this study was to compare participation in rural vs urban 5K races in northeast Oklahoma to determine possible interventions to increase participation in organized physical activity.

Methods: 5K race sites in the general northeast Oklahoma area were chosen at random and the first three finishers (as available) in each age group (male and female) along with their listed hometown were analyzed using GIS. A map was created for each race showing how far each participant traveled to the race.

Results: Preliminary results indicate that for rural races, participants travel 36.5% longer to attend, compared to urban races. Participants tend to travel even farther to participate in a rural trail or specialty event (62.8% farther than an urban event).

Conclusions: Physical activity and sport participation are a means to both maintain health and prevent future illnesses; however, there are inequities between urban and rural communities in terms of access to and participation in sports and organized physical activity. This preliminary study demonstrates the potential and need for rural communities to enhance physical activity and promote healthy lifestyles. Rural residents are willing to travel to participate in events and it would benefit communities to host more events in rural areas to increase participation in organized physical activity.

Keywords: physical activity; rural communities; health intervention

Association of Middle School Students' Consumption of Energy Drinks and Concussions: A Cross-Sectional Analysis of the Youth Risk Behavior Surveillance System.

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Introduction: In recent years, adolescent consumption of energy drinks has risen steadily. While these drinks can boost performance, they're also linked to increased risk-taking behaviors that might contribute to more young people experiencing concussions. Our main aim was to probe the potential link between energy drink use and concussion rates.

Design Methods: Using data from the Youth Risk Behavior Surveillance System (YRBSS), a study involving middle school students across 15 states, we conducted a cross-sectional analysis. This aimed to uncover any correlation between energy drink intake and concussions during physical activities or sports. After estimating the prevalence of energy drink consumption, we used logistic regression, factoring in age, sex, and ethnoracial categories, to evaluate the association.

Results: Our study revealed that 14.07% of 11 to 15-year-old middle schoolers consume energy drinks weekly. Among non-consumers, 12.76% had experienced a concussion, while among consumers, the figure was notably higher at 22.42%—a statistically significant difference (AOR 2.03, 95%CI 1.36-3.04).

Conclusion: In essence, our findings strongly indicate that middle schoolers who occasionally consume energy drinks are at a higher risk of sustaining concussions compared to non-consumers. This aligns with previous research on performance-enhancing substances and concussion risks. It underscores the urgency of delving deeper into the potential hazards of energy drink consumption among adolescents and implementing measures to cultivate safer habits within this age group.

Disclaimer: This poster was presented at the Symposium on Tribal and Rural Innovations in Disparities and Equity for Health on Saturday, September 10, 2022, hosted at OSU-COM at the Cherokee Nation.

Keyword: Pediatric, Energy Drink, Concussion

Evaluation of Genome Assemblies and Annotations Using Publicly Available Platforms

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Introduction/Objectives: Options for assembling the DNA pieces generated by short-read Illumina sequencing into a completed assembly or shorter contiguous regions for submission to the National Center for Biotechnology Information GenBank include purchased services, Python-based programs available from GitHub, and open source web-based platforms using graphical user interfaces. The goal of the present study was to evaluate assembly and annotation of a single strain of *Serratia marcescens* using programs available on four different web-based platforms: BV-BRC (BV-BRC.org), Galaxy (https://genome.usegalaxy.org.au/), KBase (kbase.us) and Proksee (proksee.ca/users/). Each of these allows users a free account with the ability to store data online and to export results, but each also has unique programs. Common to all are programs to evaluate read quality (such as FastQC), trim reads (such as Trimmomatic), assemble reads (Velvet, SPAdes and Unicycler), and analyze the assembly (Quast). The four platforms differ regarding the available annotation programs, which include Prokka, Bakta, RAST and DRAM.

Methods: SeqCenter performed Illumina sequencing of a clinically isolated strain of *S. marcescens*, 131 Watkins. Read files were imported into accounts at each of the platforms. Two platforms, Proksee and BV-BRC, use an automated pipeline of programs to assemble reads into genomes. In Galaxy and KBase, each program was individually chosen and used. Once assembled and annotated, parameters were compared for the different assemblies and annotations.

Results: Nine assemblies (5 on Galaxy, 1 on BV-BRC, 1 Proksee, and 2 on KBase) were completed. The SPAdes program on KBase was unable to be completed. Each of these 9 assemblies was then annotated using the annotation programs available on the platform : Prokka (Galaxy, KBase, Proksee), RAST (BV-BRC), DRAM (KBase) and Bakta (Proksee). The assembly length varied from 4.9 to 5.3 million base pairs (Mbp), with 7 assemblies being 5.2 Mbp. The longest contigs, 3.1 Mbp long, were obtained with Unicycler and Velvet on Galaxy, but the assembly with the fewest contigs was created with Unicycler on BV-BRC. The largest N50, which measures assembly contiguity, was 3.1 Mbp with Galaxy-based Unicycler. Results of the annotation programs on different platforms also varied. Six of the 10 assembly annotations found ~4700 coding sequences, while one (Prokka of the KBase Unicycler assembly) located 7100 coding sequences.

Conclusions: These comparisons supported the conclusion that one version of the Galaxy Unicycler program would be the most appropriate assembly program to use for submission to GenBank, while several of the annotation programs (DRAM on KBase, Bakta on Proksee and Prokka on Galaxy or Proksee) will yield comparative results.

Keywords: genome assembly and annotation, Galaxy, Proksee, KBase, BV-BRC

Anxiety in elementary-aged children in the US from 2016-2022:
An analysis of the National Survey of Children's Health

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Introduction: According to the American Academy of Pediatrics, the presentation of anxiety disorders during childhood are multifactorial with genetics, parenting style, and personality being major components. The American Psychologist Academy states there has been a decade-long mental health crisis among children. Common stressors that may have intensified childhood anxiety during this timeframe include food insecurity, homelessness, and school violence. Additionally, during the COVID-19 pandemic, 200,000 US children lost their primary caregiver and parental unemployment peaked at 21.7%, causing additional household stress.

Adolescent anxiety is a predictor of anxiety as an adult. Identifying anxiety at a young age allows for early intervention and decreased morbidity. This investigation analyzed data from the National Survey of Children's Health (NSCH) to assess rates of parent-reported anxiety and severity in 5-9 year-old children in the United States from 2016 through 2022 and to determine trends in anxiety diagnoses and severity during this timeframe.

Methods: The National Survey of Children's Health (NSCH) is a self-reported household survey that aims to gather annual information on the health of children 0-17 years of age. Using this data, we assessed trends of anxiety with linear regression during this time. We then conducted a regression to assess the difference in association among years using 2016 as the reference year. Finally, we repeated these analyses among children with anxiety disorders using severity of diagnosis (mild/moderate and severe) to determine if a change in symptom severity occurred during this timespan.

Results: The prevalence of anxiety diagnosis from 2016-2022 showed a statistically significant increase trend (Coef: 0.005; SE: 0.001, P < .001). Compared to 2016 where the prevalence of anxiety was at its lowest during this timespan at 4.86%, 2022 was the highest at 6.36%. Additionally, compared to 2016 in which 4.10% of children reported displaying severe symptoms, only 2021 and 2022 showed statistically significant increases compared to this baseline—years where children reporting severe symptoms nearly doubled at 8.21%, and 7.79%, respectively.

Conclusion: In addition to the increasing trend in reported anxiety among 5-9-year-old children, during the post-COVID-19 pandemic years, the percentage of children with severe symptoms has nearly doubled compared to 2016. Potential factors contributing to this could include loss of caregiver, food insecurity, poverty, earlier onset of puberty, and increased social stressors. As healthcare professionals, it is crucial to identify these characteristics early in childhood so that appropriate intervention can be prescribed. The USPSTF recommends anxiety screening in all children ages 8 and older. Cognitive behavioral therapy (CBT) is the treatment of choice for children with mild to moderate anxiety. Children with severe anxiety symptoms may warrant pharmaceutical intervention for appropriate management of symptoms. Early intervention with CBT may help children develop a more positive mindset using evidence-based thinking, reducing overall duration of therapy and decreasing the severity of mental health disorders as the child develops. Further research is needed to identify potential factors that may be leading to the continual increases in the overall prevalence of anxiety and severity of symptoms to identify potential therapeutic strategies.

Keywords: anxiety, pediatrics, elementary

Clinical Perspective on Core Outcome Sets in Prostate Cancer Trials: A Web-Based Survey Study

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Background: Prostate cancer (PC) is the most diagnosed cancer in men and the fifth leading cause of cancer deaths globally. Evaluation of PC clinical trials should measure outcomes from survivability to quality of life. A Core Outcome Set (COS) provides a standardized set of outcomes to be reported in clinical trials within a specific field. They are developed through the consensus of stakeholders including patients, physicians, and researchers. Following COSs in PC ensures important outcomes are measured to improve comparability and selection of PC treatment. Our objective is to evaluate the knowledge, perception, and use of COSs by trialists in PC.

Methods: Using ClinicalTrials.gov, we identified trialists and extracted their names and emails. Surveys were sent on 1/2/24 and open for eight weeks with reminders sent every two weeks to trialists who did not complete the survey. Surveys collected trialist demographic information and familiarity with PC COSs. Trialists less familiar with COSs were directed to questions that gauged interest and need for further COS information. Trialists familiar with COSs were directed to questions addressing their experiences, challenges, and suggestions for PC COSs. Survey results consisted of both qualitative and quantitative data. Analysis will include descriptive statistics for trialists demographics, thematic analysis for qualitative data, and inferential statistics for subgroup analysis.

Results: Survey response collection and data analysis are currently ongoing in our study. Our results will include descriptive statistics for trialists demographics, thematic analysis for qualitative data, and inferential statistics for subgroup analysis.

Conclusion: After the survey collection period and data analysis, our results will help us understand PC clinical trialists knowledge, perception, and use of relevant COSs. Our results could be used to identify where efforts should be best directed to promote education and adoption of relevant PC COSs.

Keywords: Prostate Cancer, Clinical Trials, Core Outcome Sets

Results of Experimental Strengthening to Treat Iliotibial Band Syndrome in Runners:
A Critically Appraised Paper

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Introduction: Iliotibial band syndrome (ITBS) is a condition where friction of the iliotibial band against the lateral condyle of the knee causes pain. Traditional treatment is considered a combination of myofascial foam rolling and stretching.

Methods: The literature was searched for best evidence determined by the CEBM levels of evidence scale. Two authors ran inclusion and exclusion criteria through databases to find suitable studies. PubMed, Science Direct, and Trip were searched for studies the investigated the effect of hip strengthening on ITBS compared to stretching.

Results: Fifty-one relevant studies were found from the search and two randomized control trials and a systematic review met the inclusion and exclusion criteria. The two randomized control trials met the purpose of the topic and were included in the critically appraised topic.

Conclusion: There is moderate evidence that supports the use of hip strengthening in the treatment of ITBS. Based on the current research, there is evidence that suggests it is the most effective to use a combination of traditional stretching and myofascial techniques such as massage and foam rolling with the addition of hip strengthening exercises.

Keywords: iliotibial band syndrome, ITBS, hip strengthening

A Quality Improvement Project to Improve Provider Education of Helping Babies Breathe, in Malawi, Africa

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Introduction: Neonatal mortality rates are highest in developing countries, primarily due to a lack of healthcare. This was witnessed first-hand during a global health trip to Malawi, Africa in 2023. One such way to reduce neonatal mortality rates is the teaching and implementation of quality neonatal resuscitation in healthcare facilities. In response to high worldwide neonatal mortality rates, the American Academy of Pediatrics (AAP) created the Neonatal Resuscitation Program (NRP). Subsequently, the Helping Babies Breathe (HBB) curriculum, a subset of NRP, has been shown to reduce neonatal mortality rates in developing countries where resources are further limited. The goal of this project is to provide HBB training resources and education to hospital staff members at Child Legacy International (CLI).

Methods: A survey was sent out to the physicians and staff members at Child Legacy International to assess current knowledge on neonatal resuscitation. A video detailing how to perform and implement Helping Babies Breathe will be recorded and sent to the staff to view. Researchers will be available to answer any questions or go over any specific topics for staff members as needed. Additionally, handouts and informational brochures will also be provided to each staff member who completes the survey. After 3 months' time, the same survey will be completed again by staff members to compare and contrast knowledge improvement. Results will be analyzed to see if the videos and handouts provided helped improve knowledge of NRP in staff members at CLI in Malawi.

Results: Results for this project have not yet been collected.

Conclusions: Thorough implementation of HBB, a subset of NRP, is proven to reduce the mortality rates of neonates. Based on first hand experience from working at CLI in Malawi, Africa, the staff members knowledge of NRP was lacking. It is expected that with proper training and resources, the knowledge and understanding of when and how to use HBB on neonates will improve with this quality improvement project. And with improved knowledge and implementation of HBB, neonatal mortality rates should also decrease as has been shown worldwide by the AAP. Results and conclusions from this project are currently pending.

Keywords: Malawi, global health, NRP, HBB, AAP

Ex vivo Organoid Cultures from Intestinal Stem Cells

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Introduction: This poster presentation explores recent developments in _ex vivo_ intestinal organoid cultures, shedding light on their potential applications in therapeutic interventions. Optimal standardized methodologies for the growth and maintenance of intestinal organoids were used, emphasizing key factors that contribute to the success of these cultures. This project is a preliminary study to establish a successful baseline intestinal organoid culture for future experimentation. Organoid growth, morphology, and viability were all evaluated.

Methods: Techniques from STEMCELL Technologies Intestinal Epithelial Organoid Culture protocol were employed, aiming to recapitulate the complex cellular diversity of the intestinal epithelium. Intestinal crypts were isolated from two male mice. These crypts were then resuspended and plated in wells with an undiluted Matrigel matrix to allow for 3D culturing, a technique demonstrated to improve emulation of the _in vivo_ environment. To each well, growth medium was added that contained specific growth factors shown to be necessary for the differentiation and proliferation of intestinal stem cells (ISCs). The media were changed every 48 hours to give the organoids longevity and promote continued growth and differentiation. The organoids were passaged at 7-day intervals to ensure proper proliferation and fresh matrix. Light microscopy was used to image organoid growth and count organoids with proper development from the crypt stem cells.. Organoid total RNA was isolated for mRNA expression analyses of ISC and cell differentiation markers using reverse transcription quantitative PCR (RT qPCR) Cultures were also prepared for detection of cell proliferation and ISC protein markers by immunocytochemistry.

Results: Intestinal crypts were successfully isolated from the donor mice and then used to grow intestinal organoids. Imaging revealed typical organoids grown in the Matrigel matrix. RNA was successfully isolated and RT qPCR showed expression ISC and cell differentiation markers. Immunocytochemistry staining is in progress to examine protein expression.

Conclusions: Insights into the recreation of _in vivo_ conditions within these "miniaturized organ" cultures offer a promising platform for studying intestinal disorders and evaluating potential therapeutic interventions. This research contributes to the evolving landscape of regenerative medicine, personalized therapy, and disease modeling.

Keywords: intestinal stem cells, organoid, regenerative medicine

Hyperdense Middle Cerebral Artery Sign in the Setting of Acute Cerebral Ischemia: A Case Report

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Background: Non-contrast computed tomography (CT) remains the initial diagnostic study of choice when ischemic stroke is suspected.[4] This is due to the ability of non-contrast CT to differentiate between hemorrhagic and ischemic stroke.[1] In the setting of acute ischemia, one of the earliest markers on non-contrast CT is the hyperdense middle cerebral artery sign (HMCAS).[3,5] This hyperdensity is suggestive of thromboemboli within an artery, most commonly the middle cerebral artery (MCA), causing vascular occlusion. Identification of HMCAS is diagnostically advantageous, expediting the patient towards anticoagulation therapy or surgical intervention. Therefore, the recognition of early manifestations of cerebral ischemia on non-contrast CT is imperative for accurate diagnosis and therapeutic guidance.

Case Presentation: Our patient was a 40-year-old female with a past medical history of non-ST elevated myocardial infarction, peripheral artery disease, and deep vein thromboembolism who presented to the emergency room with respiratory distress, nausea, and vomiting. Upon arrival, the patient was unable to follow commands, obtunded, and hypoxic with a room oxygen saturation of 86%. Given the patient's altered mental status, non-contrast CT, CT angiogram, and CT perfusion studies of the head were ordered.

Imaging revealed high-attenuation of the right middle cerebral artery (MCA) signifying arterial occlusion without intracranial hemorrhage. Reevaluation of the patient showed new-onset left-sided facial drooping as well as left upper and lower extremity paralysis. Thrombolytics were not administered due to the patient's symptomatic onset exceeding the therapeutic window. Thrombectomy was deemed a suitable treatment and the patient was transferred for urgent neuro-intervention evaluation.

Thrombectomy resulted in complete reperfusion of the right MCA with successful stabilization of the patient. Post-surgical CT demonstrated right basal ganglia parenchymal hemorrhage transformation and effacement of the right anterior horn. Days later, repeat CT revealed stabilization of the basal ganglia hemorrhage with expected evolution.

The following month, the patient revisited the emergency department with encephalopathic changes, intraparenchymal hemorrhage of the brain, and multiple clots occluding branches of the abdominal aorta. Unfortunately, the patient passed away at this time and successful interventions ceased.

Discussion: In this study, our patient presented to the emergency room with a history of chronic vascular disease and new-onset neurological symptoms. Subsequent imaging revealed HMCAS on non-contrast CT suggestive of acute ischemia. Additional imaging confirmed a thromboembolic occlusion within the first segment of the right MCA. Due to the significance of MCA involvement, neurosurgery was consulted and an endovascular thrombectomy was performed to initiate MCA reperfusion. Our findings coincide with poor clinical outcomes and neurologic deterioration in patients with ischemic stroke presenting with a HCMAS.

Conclusion: The presence of the HMCAS on non-contrast CT is specific for acute embolism and shows an increased likelihood of poor clinical outcomes with associated acute neurological deterioration. Moreover, additional studies can be useful in reducing disability by identifying salvageable tissue before initiating reperfusion therapy.[1] Due to the increased morbidity and mortality, it is crucial to be aware of early ischemic signs on non-contrast CT to guide therapeutic intervention in patients with HMCAS.

Keywords: Hyperdense Middle Cerebral Artery, Acute Ischemia, CT angiogram, CT Perfusion

The Radiologist Network: Various ways Social Media can Supplement Professional Development

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Introduction: The use of social media, such as Twitter, Facebook, LinkedIn, has become increasingly prevalent among healthcare providers for professional purposes. Therefore, identifying how social media can become supplemental for professional development is crucial for optimizing its impact for medical professionals. In this study, we aim to understand the diverse applications of social media within the field of radiology.

Methods/Materials: A literature search was conducted using the search engine Pubmed including the words *"Radiology and Social media''*. A plethora of articles populated, with nearly 826 published studies. We selectively reviewed twenty-one articles published from 2016 and onward, to display a roadmap on how diverse social media has been in the field of radiology.

Results: According to Patel et al., 65% of physicians use social media for professional use, of which 85% are radiologists. Koontz et al. reports up to 77% of internal medicine residents and up to 89% of medical students use social media as a free educational resource. Furthermore, the RANSOM survey investigated specifically how radiologists are using social media. The reported 63% of radiologists use social media to stay informed about the latest news and developments within the field, while 66% used it to communicate with colleagues about radiology related topics. In contrast, only 3% were intending to discuss image findings as a means for patient education. However Hawkins et al. urges radiologists to increase their publicity as a speciality to better educate patients on their role as up to 85% of patients were found unaware that radiologists are physicians. This study demonstrated that journals with Twitter profiles had higher Impact Factors than those without profiles (mean, 3.37 vs 2.14; P < .001). Larger number of followers was correlated with a higher Impact Factor (R2 . 0.581, P .029).

Conclusions: Social media has been harnessed by the medical community to increase professional camaraderie in numerous aspects. More specifically, radiologists commonly use their social media platforms to access the latest advancements in the field and communicate with colleagues. With 65% of radiologists using social media as a professional outlet, it is important to recognize its varying benefits for students and patients who read their content. For students interested in seeking a career in radiology, social media can offer them educational resources, mentorship opportunities, and a digital presence that can serve to build professional relationships. By exploring the profiles of healthcare providers, patients can also gain valuable insight into physician roles. With these applications in mind, social media can be utilized in medical communities to provide individuals with a clearer understanding of their field and resources for those actively interested in pursuing radiology as a career.

Keywords: Social Media, Radiology, Professional Development

Persistent Genital Arousal Disorder: A Scoping Review

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Background: Persistent genital arousal disorder (PGAD) is a rare condition characterized by unwanted and distressing symptoms of arousal and dysesthesia.

Aim: The aim of this scoping review is to map the current state of PGAD management, identify gaps in the literature, and understand patient perspectives.

Methods: We completed a scoping review following guidelines from the Joanna Briggs Institute and the PRISMA scoping reviews extension. A systematic literature search for articles pertaining to persistent genital arousal disorder/genito-pelvic dysesthesia was conducted in August 2023 via Medline, Embase, Scopus and Web of Science. The search returns were de-duplicated, and the remaining titles and abstracts were screened for inclusion. General publication characteristics and treatment data was extracted from the included publications via a pilot-tested Google form. All screening and extraction were completed in a masked, duplicate fashion.

Outcomes: Findings from our scoping review reveal a scarcity of systematic research, limited evidence-based data, and the importance of addressing both physical and psychiatric concerns.

Strengths and Limitations: All data was screened and extracted in a masked, duplicate fashion. To promote transparency and reproducibility and reduce the risk of bias the protocol and raw data was made available on Open Science Framework. Our study is cross-sectional in nature and thus findings may not be generalizable across time.

Conclusion: Management for persistent genital arousal disorder/genito-pelvic dysesthesia lacks a standardized framework indicating a need for further research and the development of clinical practice guidelines to improve patient care.

Keywords: Persistent Genital Arousal Disorder, Scoping Review, Women's Sexual Health

Racial Disparities in Access to Pediatric Medical Homes: An Analysis of the National Survey of Children's Health 2019-2021

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Introduction/Objectives: A medical home–characterized as accessible, family-centered, continuous, coordinated, compassionate, and culturally effective–is the American Academy of Pediatrics recognized model for delivering comprehensive pediatric primary care. Despite efforts to expand the availability of medical homes, many children–especially those from minority racial/ethnic groups–lack access. Given the potential adverse outcomes of racial health disparities, eliminating barriers to medical homes may improve health equity. Our study aims to identify associations between medical home access among ethno-racial groups using data from the National Survey of Children's Health (NSCH).

Methods: Utilizing NSCH 2019-2021 data, we determined rates of children with access to medical homes and access to each medical home component by racial/ethnic groups. To assess racial disparities in medical home access, we constructed a logistic regression model to measure associations, via odds ratio, between medical home access and race, controlling for child sex, age, federal poverty level, caregiver education level, and urbanicity.

Results: Among the sample of 122,979 children, 57,904 lacked access to medical homes, representing 38.7 million children or 53.12% of US children annually, with NSCH sample weights applied. Compared to White children, all racial minority children were statistically significantly more likely to lack medical home access except for Multiracial children.

Conclusions: Our study shows that children of minority groups have disproportionately less receipt of care in medical homes. This study emphasizes the need to recognize and address barriers to high-quality, comprehensive care within a pediatric medical home to improve health equity and overall health outcomes.

Keywords: Pediatric Medical Homes, Racial Disparities, Health Equity in Pediatrics

PROGRESS-Plus Analysis of Equitable Reporting for Geographic Atrophy:
A Meta-epidemiological Study in Systematic Reviews

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Background: Geographic atrophy (GA) is a late-stage sequelae of age-related macular degeneration. Systematic reviews and meta-analyses (SRMAs) are often referenced for disease management, and these documents should provide culturally appropriate guidelines to ensure equitable care. It is unknown whether GA specific SRMAs reflect these needs, thus our meta-epidemiological study aims to fill this knowledge gap by applying the PROGRESS-Plus analysis to current literature.

Methods: To identify eligible SRMAs, we conducted a systematic search of three databases. Two researchers were assigned the task of identifying GA associated literature in a masked and duplicative fashion. Data was then analyzed by two additional researchers following the PROGRESS-PLUS framework with the inclusion of *P*lace, *R*ace/ethnicity, *O*ccupation, *G*ender/sex, *R*eligion, *E*ducation, *S*ocial capital, and *S*ocioeconomic status (SES), and other characteristics of the SRMAs. Any conflicts with data identification or analysis were reconciled via discussion.

Results: In the initial search, 176 articles returned, of which 119 were excluded due to replication or irrelevance to GA. Of the remaining 57 studies, 26 (45.6%) did not include any PROGRESS-Plus items. It was noted that equity items were reported less in SRMAs conducted within the US (31.3%, 5/16) compared to other countries (63.4%, 26/41), which held statistical significance (P=.028). The most commonly included equity items were age, sex, and race/ethnicity. Other study characteristics were not significantly associated with the inclusion of equity items.

Conclusions: Among the PROGRESS-PLUS items reported within SRMAs, our study found that among many factors, education and SES were consistently lacking. Currently, the American Academy of Ophthalmology is taking on novel initiatives to grow diversity, equity, and inclusion within the field. Equitable reporting within SRMAs is essential for understanding precipitating factors of ophthalmologic disease and ensuring the improvement of comprehensive treatment for future patients.

Keywords: Geographic Atrophy, Equitable Reporting, PROGRESS-Plus

Do Standardized Patients Improve Professional Athletic Training Students Confidence and Clinical Skill Set?: A Critically Appraised Topic

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Clinical Scenario: Athletic training (AT) students' professional preparation include multiple opportunities for hands-on opportunities both in the classroom and clinical setting. Standardized patients (SPs) can also be a contribution for hands-on opportunities when there isn't enough exposure in the classroom or clinical setting.

Clinical Question: Do Standardized Patients Improve Professional Athletic Training Students Confidence and Clinical Skill Set?

Summary of Key Findings: A computerized search was conducted on standardized patients and how they affect athletic training students' confidence and clinical skill set. Three studies discussing the use of standardized patients in professional athletic training programs were included. One study used athletic training students and nursing students to identify interprofessional skills and communication. 2 studies used SPs just within athletic training programs with one measuring AT student's past experiences with SPs and the other study measuring ATs perceptions using SPs via Telemedicine.

Clinical Bottom Line: The evidence suggests that SP encounters improve AT students' clinical skills and confidence. SPs allows for students to get exposure to certain skills or situations they may not have been exposed to during clinical education.

Strength of Recommendation: Based on the JBI Checklist for Qualitative Research all three articles should be included in this study.

Keywords: athletic trainers, standardized patients, athletic training, MAT students, MAT program.

Change in teen dating violence prevalence and associated demographic characteristics before and after COVID-19 lockdowns.

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Introduction/Objectives: Increased rates of intimate partner violence (IPV) were a devastating side-effect of COVID-19 lockdowns. Despite this well-documented increase in rates of IPV against adults, there has been minimal research exploring potential changes in rates of teen dating violence (TDV) across the pandemic. While research has suggested that TDV occurs in different contexts from IPV-facing adults, the aftereffects of TDV are similarly problematic and they can result in long-term mental and physical health issues. Members of various minority groups are at particular risk for IPV due to higher rates of victimization and perpetration. Further, some of these groups have been disproportionally impacted by the pandemic which may lead to additional increased risk. As such, an intersectional lens is necessary to adequately investigate pandemic-related changes in TDV rates. To parse these potential relations, we will examine rates of TDV before and after the start of the 2020 pandemic, across a diverse nationally-representative population.

Methods: The current study utilized data from the Youth Risk Behavior Surveillance Survey (YRBSS), a nationally representative survey of health risk behaviors experienced by students in grades 9-12 in the United States. For the current study, data concerning demographics and teen dating violence from the 2019 and 2021 YRBSS were used to analyze the prevalence of physical and sexual TDV pre- and post-Covid-19 pandemic. Weighted prevalence and 95% CIs of outcomes were calculated for each year by demographics and sex of sexual contacts. Pairwise t-tests were used to identify demographic differences among outcomes. Across years, change in prevalence of outcomes was assessed by using absolute and relative measures of association overall and by demographics.

Results: We found that teen dating rates significantly decreased from 64.32% to 55.69%. While physical TDV increased slightly (8.23% to 8.54%), we found that sexual TDV significantly increased from 8.20% to 9.72%. In particular, sexual victimization among girls significantly increased from 12.61% to 15.32%. Whereas sexual victimization of teen boys increased but not significantly, from 3.81% to 4.05%. Sexual TDV rates shifted by race with rates decreasing for American Indian/Alaskan Native, Asian, Black, and Native Hawaiian/Pacific Islander teens and increasing for Hispanic/Latino, White, and Non-Hispanic Mixed-Race teens. Additionally, sexual TDV rates decreased for students who never had sex and whose sexual contacts were same-sex only and increased for students whose sexual contacts were opposite sex only and both sexes.

Conclusions: The findings indicate a notable decrease in teen dating, coupled with a significant rise in sexual TDV, especially among female adolescents. The data suggest that the pandemic's impact on teen behavior and interactions has been complex, with varying effects across different racial and ethnic groups. Although, these results are cross-sectional in nature and cannot imply a causative relationship between TDV rates and the COVID-19 pandemic. These results highlight the importance of continuous monitoring of TDV trends, especially in the context of global crises, to better protect and support vulnerable youth populations.

Keywords: Teenagers, dating violence, COVID-19, sexual dating violence

Top 100 Most-Cited Publications of All Time in Mohs Micrographic Surgery: A Bibliometric Analysis

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Background: Bibliometric analyses are used for interpreting the structural, social, and economical components of scientific data, mapping the information entailed. For these reasons, bibliometric analyses provide meaningful insight by collecting an entire overview of a field's research output, deriving new ideas for future research, and identifying research gaps and trends over time.

Objective: This study aims to perform a bibliometric analysis to evaluate the dynamic trends and characteristics of the top 100 most-cited publications in Mohs micrographic surgery (MMS).

Methods: We searched the Web of Science Database, a selective reference and citation index of scholarly journals. All articles published up to March 7, 2023, were included in our return. Returned articles were screened, and data from the top 100 most-cited were extracted in a masked, duplicate fashion. The R and RStudio programs were applied to perform comprehensive mapping analyses of the included studies. The VOSViewer program was used to produce overlay maps for keyword analysis.

Results: The mean number of citations for the top 100 articles was 84.4, with the most cited article having 309 citations and the least cited article having 35 citations. Among our sample, observational studies were our most frequent study type, with 86 studies, and systematic reviews/meta-analyses were least frequent, with 2 studies. Leibovitch was found to have the most publications as a first author, with 8 studies, and Brodland had the highest number of total authorships in the sample, with 12 studies. The *Journal of American Academy of Dermatology* had the most publications in the sample, with 35. The year with the most activity was 2005, with 10 publications.

Conclusion: This study outlines the top 100 most-cited publications within the field of MMS and which study factors have provided us with the current state of MMS literature. Social and economic factors were identified to assist in the mapping of MMS research. We believe that the results of this study offer insight for future MMS research, particularly in terms of directing future research. Furthermore, we recommend future authors use our study as a guide for identifying areas of focus, and to improve the overall impact of their published work.

Development of a multiplex assay to characterize ADAMTS13 structure and function

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Introduction: The metalloprotease ADAMTS13 is composed of metalloprotease (M), disintegrin-like (D), thrombospondin-1 (T), Cysteine-rich (C), and spacer (S) domains, followed by seven T domains and two CUB domains. Genetic or autoimmune deficiency of ADAMTS13 causes thrombotic thrombocytopenic purpura (TTP), which is characterized by life-threatening microvascular thrombosis. We recently uncovered a cryptic mechanism by which ADAMTS13 Dis and Cys-rich VWF binding sites couple to regulate substrate-induced activation of ADAMTS13.

Aim: To develop multisubstrate-based assays to evaluate ADAMTS13 activity and function.

Method: The novel multiplex ADAMTS13 assay utilized up to 12 fluorogenic substrates prepared from human and bovine VWF A2 sequences. The substrates are chimeric substrates between Cattle VWF (C-71) and Human VWF (H-71). ADAMTS13 Dis- or Cys-rich binding sites were swapped between H-71 or C-71 peptide backgrounds. Disease-causing mutations were introduced into the wild-type ADAMTS13 by mutagenesis. Wild-type recombinant ADAMTS13 and variant proteins were expressed transiently or stably in HEK293 cells. The animal plasmas used in the current work has been described previously. Assays were performed as we described before, and mean results were reported.

Results: Ten novel chimeric FRET substrates were prepared by swapping unique amino residues between cattle VWF71 (C-71) and human VWF71 (H-71). Simultaneous cleavage of all 12 substrates by species-specific ADAMTS13 led to distinctive cleavage rates for each plasma ADAMTS13. This was expected because each species ADAMTS13 has its protein sequence and posttranslational modifications that dictate its interaction with the substrate VWF. Peptide substrates that showed stringent cleavage rates across multiple species were selected for additional validation. These substrates differed mainly between the ADAMTS13 Dis and Cys binding sites. Human pooled normal plasma (PNP), recombinant human ADAMTS13, and ADAMTS13 variants were assayed further by the multiplex ADAMTS13 activity method. Consistent with our expectation, recombinant ADAMTS13 expressed in HEK293 cells showed cleavage rates slightly different from the plasma ADAMTS13. Remarkably, the multiplex assay was able to distinguish truncated ADAMTS13 proteins and recombinant ADAMTS13 with mutations that cause partial activity decreases from the wild type.

Conclusions: The ADAMTS13 multiplex assay can be used to evaluate structural perturbations in ADAMTS13. This assay may be useful to test ADAMTS13 function in diseased states where a near-normal ADAMTS13 activity is reported by conventional methods.

Keywords: ADAMTS13, VWF, TTP, Enzyme Assays, FRET

A cross-sectional examination of stigmatizing language within medical literature on schizophrenia and psychosis

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Background: Conditions of psychosis have been the subject of significant stigma, leading to delayed treatment for individuals experiencing early symptoms of psychosis, for fear of being labeled "crazy" or "psychotic." Delayed treatment can worsen the prognosis of individuals with psychosis. Proper adherence to person-centered language guidelines can curb the widely-held stigmatized preconceptions about psychotic conditions. The objective of this paper is to determine the rate of adherence to person-centered language (PCL) guidelines among published literature on schizophrenia and other conditions of psychosis.

Methods: We began with a systematic search of literature in PubMed discussing schizophrenia or psychosis from 2020-2022. Our analysis included the articles of journals which had published at least 20 articles on the subject. Among search results, we randomly selected 500 articles, of which 241 articles met inclusion criteria. These papers were screened for usage of stigmatized language, and the article type, research focus, and institution type were noted for further analysis.

Results: Preliminary results reveal that 54.0% (121/224) of articles screened included stigmatized language, such as labels or emotional phrases. The most common stigmatized phrase identified was "schizophrenia patient," found in 35.7% of papers. "Schizophrenic [patient/subject/etc]" was found in 12.5% of papers. The type of intervention was the only variable which was found significant for PCL guidelines adherence, with 55.4% (103/186) of "no treatment (purely observational)" articles including stigmatized language, compared to 32.7% (18/55) of all other types. Type of article, research, funding, and institution were not found significant for PCL adherence. These preliminary results do not include papers which are inaccessible, and awaiting ILL.

Conclusion: The majority of medical articles screened did not adhere to PCL guidelines. Usage of stigmatized language in literature reinforces the use of these labels in medical education, in doctor's offices, and in popular culture. Given the impact of stigma on treatment delay–and the poor prognosis that may result–proper care should be taken to enforce person-centered language in medical literature. Reducing the fear of labeling is a necessary step in encouraging treatment for people experiencing early symptoms of psychosis.

Prevalence of depression among people enrolled in home health care based on sociodemographic factors

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Objectives: More than 15 million individuals receive home health care for chronic conditions. This care allows them to maintain a level of independence and self-sufficiency. Even though poor mental health can negatively impact health outcomes, little research has been done on the mental health of these individuals enrolled in home health.

Methods: Utilizing NHIS survey years 2019-2022, we ran a cross-sectional analysis to determine rates of depression among individuals who indicated that they utilized HHC services, based on their sociodemographic statuses and diagnosis, as well as their rate of depression by condition based on whether they utilized HHC services.

Results: HHC recipients were significantly more likely to be depressed if they reported being female, age 55-64, low income, low educational attainment, American Indian/Alaskan Native (AIAN), Hispanic, or lived in a rural area. HHC recipients were more likely to be depressed than their non-HHC recipient counterparts (likely secondary to a more advanced disease process), except for individuals with dementia. Among all HHC recipients, a history of dementia, COPD, stroke, diabetes, and chronic heart disease was associated with higher reported depression, whereas a history of cancer did not see an increase in depression.

Conclusions: This data demonstrated that certain subsets of HHC recipients report higher rates of depression. The results underscore the need for better integrated mental health care services for recipients of HHCs. Further, the financial burden of HHC, which may have an additional impact on stress and depression, emphasizes the need for expanded insurance coverage and accessibility of these services.

Keywords: home health care; caregiving; home care; depression

Unveiling the Digital Terrain: Exploring the Landscape of Cyberbullying on Twitter Through the Analysis of Common Toxic Words Used by Cyberbully

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Introduction: Cyberbullying is a serious issue that has become more prevalent in our digital age. The negative effects on the mental health of cyberbullying victims can be severe, and it can lead to anxiety, depression, and even suicidal thoughts. Addressing cyberbullying requires a multifaceted approach that involves individuals, communities, educators, online platforms, and policymakers. Creating a safer and more inclusive digital environment involves responding to incidents of cyberbullying and prevention efforts through awareness campaigns and promoting positive online behaviors. However, designing an effective cyberbullying prevention awareness program can be challenging due to the ever-evolving nature of online interactions. Analyzing toxic words plays a crucial role in staying ahead of evolving tactics and adapting prevention efforts accordingly. This study aims to conduct a trend analysis of cyberbullying based on natural language processing (NLP) to gain a deeper understanding of emerging trends and patterns in cyberbullying behavior.

Methods: We have applied NLP techniques using sentiment analysis to online text posts that are related to cyberbullying. By doing so, we are able to understand the trends over time. One of the models that we used is the naive Bayes (NB) classification model, which is a probabilistic machine learning model based on Bayes' theorem. It is commonly used for text classification and assumes independence among features. To perform the analysis, we used a Tweets cyberbullying dataset that contains #### tweets related to cyberbullying. Before running the NB model, we preprocessed the dataset by tokenizing, removing stop words, and converting them to lowercase. The NB model classifies the tweets into two categories: either "not cyberbully" or if they are "cyberbully," then they are further categorized into "race," "gender," "religion," and "ethnicity." After classification, we calculated the frequency distribution of words in each category to identify the commonly used toxic words for each cyberbully category. Throughout the analysis process, we leveraged Python libraries like NLTK or spaCy.

Results: The study investigates trend analysis of the most commonly used toxic words in different types of cyberbullying tweets. We listed the toxic words mapped with the cyberbullying category related to "race," "gender," "religion," and "ethnicity," along with the frequency distribution.

Conclusion: The study systematically investigates the association of toxic words related to different categories of cyberbullying from Twitter post content. It provides valuable insights into the prevalence and patterns of cyberbullying on social media platforms. Understanding the contextual factors of cyberbullying is crucial in preventing and combating such behavior. The findings from the study can contribute to the ongoing efforts to make the online space safe and inclusive for everyone.

Keywords: Cyberbully, digital platforms, safe online space, natural language processing, trend analysis

MRI-based morphometrics of hand+wrist joint spacing in a patient with Juvenile Idiopathic Arthritis

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Background: Juvenile idiopathic arthritis (JIA) is a subtype of rheumatic polyarthritis. Pathophysiology of JIA is defined by the abnormal activation of both the cell-mediated and humoral immune response, leading to the degradation of joint synovium, cartilaginous structures, and bone. MRI can be utilized to visualize joint morphology changes from the effects of JIA. The full efficacy of MRI to evaluate bone erosion in the early stages of JIA is unknown; thus, our case report aims to understand this potential.

Methods: A 23-year-old Caucasian female with an 11-year history of JIA autonomously participated in our study. We utilized T1 weighted MRI to retrieve images of the patient's right hand. Software programs Horos and Slicer allowed for analysis and full 3D volume rendering of series coronal and sagittal plane images. Then, bone morphology and distance evaluation between articular surfaces of variable carpal joints were examined. Joints analyzed included radiocarpal, ulnocarpal, and distal radioulnar. Joint spaces between radius-scaphoid, radius-lunate, ulnar-lunate, and ulnar-triquetrum were also measured. Lastly, individual phalangeal joint spaces were captured of digits I-V (metacarpophalangeal, proximal interphalangeal, distal interphalangeal). We approximated mean distances by averaging six transects with equivalent spacing between them within each joint.

Results: The smallest measurement in both the sagittal and coronal planes was 0.778 mm in the fifth digit DIP joint in the coronal plane, followed by the first digit MCP joint in the sagittal plane at an average spacing of 0.787 mm. Several other spaces measured under 1 millimeter. In the coronal plane, the PIP joint on the third digit measured 0.973 mm, the PIP on the fourth digit 0.839 mm, and the DIP on the fourth digit 0.954 mm. In the sagittal plane, the PIP on the second digit 0.862 mm, the DIP on the third digit 0.993 mm, the DIP on the fourth digit 0.819 mm, the PIP on the fifth digit 0.881 mm, and the DIP on the fifth digit 0.830 mm. The greatest spacing between bones occurred in the coronal view between the ulna and triquetrum bones at 8.831 mm, followed by the ulna and lunate joint space at 5.536 mm. Other carpal bone spacings in the coronal view were 2.727 mm for the radius and scaphoid joint space, 2.478 mm for the radius and lunate joint space, and 2.253 mm for the distal radioulnar joint space.

Conclusion: This case demonstrates the potential for routine joint imaging in patients with JIA to monitor for treatment efficacy and changes in morphology secondary to inflammatory processes. Early detection of bone erosion through MRI can determine dosage variability, the type of treatment course, and a better prognosis in preventing further joint damage. Extensive research in inflammatory polyarthritis is currently underway with novel studies focusing more on improving comprehensive treatment for future cases of pediatric rheumatic disease. Further imaging from our ongoing research may provide better insight into the progression of JIA and its transition into other fulminant, inflammatory arthritic conditions.

Keywords: JIA, MRI, morphometrics

Social Determinants of Health: Malawi, Africa

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Social determinants of health are a prominent issue facing healthcare worldwide. While social determinants of health reflect specific communities, there remains a universal concern: struggle for access to healthcare. This is an issue faced by many and can disproportionately affect certain communities which contributes greatly to overall poor health outcomes. During the Summer of 2023, a cohort of Oklahoma State University College of Osteopathic medical students had the opportunity to travel to and work at Child Legacy International Hospital in Malawi, Africa. Students were able to witness some of the struggles that the community faced including conditions related to: preventable and communicable illnesses, prenatal care, postpartum care, malnutrition, poor sanitation, and lack of resources. Throughout this experience students were able to engage with hospital staff members as well as community members to gain their perspective on the issues faced by many Malawians and how they believe they can overcome those barriers. Overall catching a glimpse into the lives of Malawians and the struggles they face. The goal of this presentation is to raise awareness of barriers to healthcare in Malawi, Africa. This awareness will lead to further research and will aid in improving health outcomes in the nation.

Insights into Innovation: A Cross-Sectional Analysis of vNOTES in Obstetrics and Gynecology via ClinicalTrials.gov

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Introduction/Objectives: Natural Orifice Transluminal Endoscopic Surgery (NOTES), introduced in 2004, involves the utilization of natural orifices to allow access to the peritoneal cavity for endoscopic surgery—which more recently has been used via the vagina (vNOTES). Given the novelty of vNOTES, our primary objective was to assess clinical trials that have been conducted using this technique in the field of OB/GYN.

Methods: We conducted a cross-sectional analysis of the National Library of Medicine's Clinical Trial Database to assess the current spectrum of vNOTES clinical trials and their characteristics.

Results: We found 21 clinical trials meeting the inclusion criteria—of which only 5 had been completed and only 1 of these reported results. Additionally, only 2 of the trials were registered in the United States.

Conclusions: While there is only 1 trial with reported results via clinicaltrials.gov, this study showed fewer postoperative complications than laparoscopic surgery, such as urinary tract infections. The novelty of the technique requires further investigation as well as practice guidelines for its use. Although there are limited trials on vNOTES, it may be beneficial for patients who are candidates for vaginal hysterectomy.

Keywords: Natural Orifice Transluminal Endoscopic Surgery, vNOTES, Clinicaltrials.gov, Hysterectomy

Trends in the Prevalence of Down Syndrome through the COVID-19 era: An examination of the National Survey of Children's Health, 2016-2022

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Introduction: Down Syndrome (DS) is the clinical manifestation of Trisomy 21 and is the most prevalent chromosomal abnormality in live births, contributing to cardiovascular abnormalities and intellectual disability. Although lifetime prevalence of DS is increased compared to 1950, precise calculations remain stringent due to limited birth registries and limited data availability. The prevalence of DS increases with increasing maternal age and medical advancements leading to longer survival of individuals with DS and decreases with early termination of pregnancy following prenatal diagnosis and decreasing overall birth rates. Since the 1990s, these opposing factors have resulted in a stabilization of DS prevalence. However, the DS prevalence has not been explored throughout the COVID-19 pandemic era. Thus, this study aims to assess changes in the prevalence of DS among children under 18 years of age from 2016 to 2022 and potential disparities by ethnoracial groups.

Methods: In this cross-sectional analysis, we analyzed the prevalence of DS using the National Survey of Children's Health (NSCH) from 2016 through 2022. We used a design-based X^2 test to determine if the prevalence of DS differed among the years and regression to determine the presence of a trend. We also estimated the prevalence of DS by ethnoracial groupings and tested for differences using a X^2 test. Survey design and sampling weights provided by the NSCH were employed and adjusted for analyses requiring multiple years of data, according to the NSCH methods manual.

Results: From 2016 to 2022, the prevalence of DS exhibited notable fluctuations among the 278,538 individuals sampled, with 603 individuals reported their child having DS. Specifically, the weighted percent of DS prevalence increased overall from 0.14% in 2016 to 0.26% in 2022, revealing a statistically significant 0.022% annual increase via regression analysis (95% CI: 0.0072%-0.037, t=2.92, *P*=.004; Table 1).

By ethnoracial group, the prevalence of DS was highest among American Indian/Alaska Native (0.45%), Native Hawaiian/Other Pacific Islander (0.30%), and Hispanic children (0.22%), though the distribution of DS among ethnoracial groupings was not statistically significant for the combined years ($X^2_{(4.83,\ 1.3e+06)}$= 0.84, *P* = .52; Table 2).

Conclusion: To our knowledge, this is the first study to assess the prevalence of DS among children through the COVID-19 pandemic, which found a significant increase in its prevalence from 2016 through 2022. While we do not suggest nor are we aware of any correlation between DS prevalence and the COVID-19 pandemic, a variety of social, demographic, genetic, or other factors could be at play to explain this observed increase, such as average maternal age or rates of conception and childbirth.

In conclusion, our study contributes to the evolving landscape of DS prevalence and highlights the importance of considering external factors in shaping health outcomes. The observed variations in DS prevalence among diverse populations underscore the complexity of such genetic disorders and emphasize the necessity for multifaceted, inclusive research to guide public health interventions.

Keywords: Down Syndrome, National Survey of Children's Health, Trisomy 21, COVID-19, ethnoracial disparities

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Background: Diabetes mellitus is a significant health challenge with increasing prevalence rates and substantial economic implications. Prescription drug costs for diabetes medications contribute to the financial burden faced by individuals with this condition. The Mark Cuban Cost Plus Drug Company (MCCPDC) provides generic drugs at affordable prices, potentially alleviating this burden. However, the effectiveness of MCCPDC in reducing diabetes medication costs compared to Medicare has not been assessed.

Methods: A cross-sectional review compared drug prices for diabetes medications on the MCCPDC website (as of July 12, 2023) to the 2021 Medicare Part D spending data. The study followed best practice recommendations and ensured transparency and reproducibility. Thirteen drugs were included in the sample, and data extraction and calculations were conducted independently by two authors.

Results: Overall, the 30ct drug prices were higher for MCCPDC compared to Medicare, with Medicare potentially saving $1.25 billion. For 90ct drug prices, Medicare showed potential savings of $60 million over MCCPDC. Metformin significantly impacted cost differences. When excluding Metformin, the overall cost difference for 30ct favored Medicare by $412 million, while 90ct favored MCCPDC by $158 million.

Conclusion: While the MCCPDC offers cost savings for some diabetic medications compared to Medicare, others show increased prices. Individual drug evaluations are crucial to determine potential cost savings. Further research is needed to explore cost-saving opportunities for other medical care areas through initiatives like MCCPDC.

Keywords: Diabetes; mellitus; MCCPDC; Medicare

Equity Reporting in HIV PrEP Systematic Reviews

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Introduction/Objectives: Pre-Exposure Prophylaxis (PrEP) is a cocktail of medications taken orally or injected to prevent Human Immunodeficiency Virus (HIV) infection. Given the disproportionate impact of HIV on minority communities, health equity is a topic of concern. In addition, rates of transition and acquisition may also be linked to location, religion, and mental health. As equity reporting can provide culturally informed approaches to medical care and systematic reviews can be used to guide patient management decisions, we aimed to assess equity reporting in systematic reviews or meta-analyses (SRMA) of PrEP utilizing PROGRESS Plus.

Methods: We conducted a systematic search of PubMed (MEDLINE), Embase, and Cochrane Database for SRMAs of PrEP usage. After screening, we used the PROGRESS Plus framework to extract whether domains of equity—Place of residence, Race/ethnicity/culture/language, Occupation, Gender/sex, Religion, Education, Socioeconomic status, Social capital, age and disability—were reported.

Results: After screening the articles returned from the search, our sample included 36 SRMAs that assessed PrEP usage. Our results showed that among SRMAs of PrEP, Place and Gender/Sex were the most commonly reported elements of the PROGRESS Plus framework with 34 of 36 studies (94.44%) including these criteria. The least commonly reported elements were Religion (0/36,0.00%), Disabilities (1/36,2.77%), Social capital (6/36,16.67%), and Education (8/36,22.22%). Among these SRMA's, 19 (of 36;52.78%) did not conduct any subgroup analyses. Of the studies that did, Gender/Sex and Age were the most commonly assessed.

Conclusions: Our study found nearly all SRMAs reported the samples Gender/Sex, and age; however, many other equity criteria that likely affect the usage of PrEP was lacking from a majority of studies. Additionally, very little subanalysis was conducted to investigate the impact of these domains. The limited reporting of PROGRESS Plus items within these SRMAs suggests a need for better inclusion to reduce barriers for PrEP usage and thus improve HIV prevention strategies.

Keywords: HIV, PrEP, equity

"StudentBody:" Energizing Research Passion and Anatomical Learning by and for OSU's Student Body Through Medical Imaging

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Introduction/Objectives: Active hands-on learning leads to superior acquisition and retention of complex information. We developed the "StudentBody" program at the OSU College Of Osteopathic Medicine (OSU COM) with the objective of facilitating active learning via student-initiated research experiences involving medical imaging (such as MRI, 3D digital reconstruction, and 3D printing) to develop tools for the broader education of their peers, future colleagues, and patients.

Methods: Curiosity-driven, self-motivated exploration for students can bridge basic sciences and clinical learning with projects that they devise and create for the classroom and themselves. In two sessions per year, health professions students scan themselves at the OSU Biomedical Imaging Center using state-of-the-art MRI resources. Subjects and partnering students complete each project at the OSU COM CT Imaging Lab. Students develop their own research projects to investigate aspects of anatomy they are passionate about, while supported by a doctoral student in Anatomy.

Results: Through these activities, students scan their own body for the education of the entire student body. With student consent, the scans and derived products are then securely stored and indexed for future research and educational explorations. Ongoing projects include:

- Student Drs. Lauren Hartsel, Tyler Mckenzie, and Kelcey Nees developed their own project entitled "3D carpal joint spacing from MRI in subjects with and without Childhood Onset Autoimmune Disorder." Further control and affected students are joining this project to increase the study size and carry the project long past its origin.
- Student Dr. Ryan Emmert's results from "Subject-produced model of the visual system from MRI head + neck scan" are undergoing 3D-printing for use as an educational enhancement for the Nervous System course in 2024.
- Student Dr. Kaylin Ray fulfilled her research rotation with "Musculoskeletal model of a subject's lower limb derived from MRI." This project inspired new method development to reconstruct muscles using standard MRI without contrast. The method has catalyzed further research into dynamics and bone response in female athletes, and equine limb stress during extreme exercise.

Conclusions: Involved student doctors are exposed to the process of research, particularly in medical imaging. This immersion will augment their critical evaluations of essential new research in their fields. As this project grows, we will quantify the relative retention of anatomical knowledge between students involved in "StudentBody" and a control group of nonparticipating students with similar initial scores from their first-year gross anatomy and neuroanatomy courses. Furthermore, we will evaluate the level of value these scans and derived 3D models add as educational aids for future classes of health professions students.

Keywords: medical imaging, anatomical learning, 3D models

Biliary Tree of Knowledge: Assessing Cholecystitis Google Searches

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Introduction/Objectives: Cholecystitis is a common form of upper abdominal pain. With its high prevalence and the various non-surgical and surgical treatment options, we believe patients are searching the internet for questions pertinent to cholecystitis. No investigation has ever been completed into cholecystitis Google searches, therefore we sought to classify these questions as well as assess their levels of quality and transparency using Google's Frequently Asked Questions (FAQs).

Methods: We searched Google using search terms involving cholecystitis treatment. The FAQs were classified by the Rothwell Classification schema and each source was categorized. Transparency and quality of the sources' information were evaluated with the Journal of the American Medical Association's (JAMA) Benchmark tool and Brief DISCERN.

Results: Our Google search returned 325 unique FAQs after removing duplicates and unrelated FAQs. Most of the questions pertained to surgical treatment (190/325, 58.5%), followed by disease process (79/325, 24.3%), and then non-surgical treatment (56/325, 17.2%). Medical practices accounted for the highest amount of FAQs unable to meet the JAMA benchmark (107/146, 73%). The one-way analysis of variance revealed a significant difference in median quality of Brief DISCERN scores among the 5 source types (H(4) = 49.89, P<0.001) with media outlets (10/30) and medical practices (12/30) scoring the lowest compared to academic sources which scored highest (21/30).

Conclusions: Medical practices are the most frequent source Google recommends for FAQs but deliver the lowest quality and transparency. To increase the quality and transparency of online information regarding cholecystitis treatment, online sources should strive to include the date, author, and references for online information.

Keywords: Cholecystitis, Rothwell Classification, JAMA Benchmark, Quality, Transparency

Inflammatory Sources: Exploring Google Searches for Gastritis

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Introduction/Objectives: Gastritis is a general form of upper abdominal pain. With its high frequency and the copious non-surgical and surgical treatment options, we believe patients are likely searching the internet for questions applicable to gastritis. No investigation has ever been completed into gastritis Google searches, therefore we sought to classify these questions as well as assess their levels of quality and transparency using Google's Frequently Asked Questions (FAQs).

Methods: We searched Google using questions on gastritis and extracted the sources of a minimum of 200 questions for evaluation. Information transparency was assessed using the Journal of the American Medical Association (JAMA) Benchmark, classification was defined using the Rothwell Classification of Questions, and information quality was assessed using Brief DISCERN.

Results: Our Google search returned 228 unique FAQs after removing duplicates and unrelated FAQs. The majority were classified as fact-based questions (103/228, 45.2%), followed by value (76/228, 33.3%) and policy questions (49/228, 21.5%). Most FAQs pertained to surgical treatment (127/228, 55.7%), followed by non-surgical treatment (66/228, 28.9%) and then disease process (35/228, 15.4%). The one-way analysis of variance revealed a significant difference in median quality scores among the 5 source types (H(4) = 18.97, P <.001) with medical practices (12/30) scoring the lowest compared to government (16/30), academic (16/30), and media outlet (22/30) sources which were found to have the highest.

Conclusions: To increase the transparency and quality of online information regarding gastritis treatment, sources should refer to accepted standards such as JAMA Benchmark and Brief DISCERN when publishing online information.

Keywords: Gastritis, Rothwell Classification, JAMA Benchmark, Quality, Transparency,

Associations of clinical personnel characteristics and telemedicine practices

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Background: The use of telemedicine strategies has been increasing in the US for more than a decade, with physicians taking advantage of this new tool to reach more patients. Determining the specific demographics of physicians using telemedicine most in their practice can inform recommendations for expanded telemedicine use among all physicians and aid in mitigating the need for physicians felt by urban and rural populations.

Methods: We performed a cross-sectional study of the 2021 National Electronic Health Records Survey to determine the relationship between physician characteristics and telemedicine practices. Differences between groups were measured via design-based chi-square tests.

Results: Compared to male physicians, female physicians were more likely to use telemedicine services (X^2 = 8.0; P = .005). Compared to younger physicians, those over the age of 50 were less likely to use telemedicine services (X^2 = 4.1; P = .04). Compared to primary care physicians, medical and surgical specialty physicians were less likely to use telemedicine services, with surgical specialty physicians being the least likely overall (X^2 = 11.5; P < .001). We found no significant differences in telemedicine use based on degree (Osteopathic and Allopathic).

Conclusions: Our results showed a statistically significant difference between physician's age, sex, and specialty on telemedicine use in practice during 2021. Efforts to increase telemedicine use among physicians may be needed to provide more accessible care to patients. Thus, by increasing physician education on the importance of telemedicine for modern patients, more physicians may decide to use telemedicine services in practice.

Keywords: Telemedicine, physician characteristics, NEHRS

Improving Mammography Screening Percentages in Overdue Women: A Tribal Medical Track Quality Improvement Project

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Background: In Cherokee County, mammography screening percentages are below the overall state and national averages. This is problematic, as adequate and timely mammograms can detect breast cancer at an earlier stage. This quality improvement (QI) project, conducted during a four-week clinical rotation, aimed to increase screening among overdue patients at a Cherokee Nation family medicine clinic and to assess the feasibility of conducting QI studies during short rotations.

Methods: During scheduled in-clinic appointments with eligible patients, the medical student (and first author) assigned to the patient's physician used motivational interviewing (MI) to encourage women to schedule mammograms. Patients' electronic health records were followed until a completed mammogram appointment was viewed or until December 21, 2023, whichever came first.

Results: Only two patients seen during the project timeframe were overdue for screening and one completed screening by the project cutoff date. The other patient indicated she preferred a more "natural" approach and thus never planned to get screened.

Conclusions: Targeted motivational interviewing during scheduled in-clinic appointments may increase the likelihood of women obtaining mammogram screening. The project demonstrated the feasibility of conducting QI projects during short rotations, but also identified challenges of reaching targeted patients who may or may not visit the clinic during the rotation.

Keywords: Mammography, quality improvement, medical education

Comfort of a Transgendered person with OMT: A Case Study

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Introduction: The Williams Institute estimates that there are 1.6 million persons aged 13+ in the United States that identify as a transgender individual. Transgender individuals may avoid or delay seeking healthcare services and often do not disclose gender identity due to fear of discrimination.

Case: A 20-year-old transgender male with a history of asthma and anemia presented to the Osteopathic Manipulative Medicine clinic with complaints of right-sided, mid-back pain unassociated with any recent injury or trauma. He described this pain as chronic, daily, and a 2 out of 10 on a pain scale. Pain is exacerbated with sitting or lifting objects. Physical exam revealed decreased CRI, OM suture restriction, OA compression, restrictions and paraspinal muscle tension in the cervical and thoracic spine, and a restricted diaphragm. OMT was directed towards the somatic dysfunctions of the diaphragm, thoracic and cervical spine, and cranial structures. A variety of techniques were utilized however the most effective modalities were myofascial release, articulatory techniques, and HVLA.

Results: After the third treatment, the patient noted considerable improvement in his symptoms. He reported increased thoracic spine mobility following OMT treatments. The patient reported being comfortable with the providers providing OMT during appointments. He expressed that the OMM clinic was a welcoming healthcare environment where he was able to feel at-ease in discussing his medical history and background.

Discussion: Our case study aimed to gain to transgender patients' comfort during OMT appointments. It is possible that this research can be guided to assess a larger scale of transgender patients with their comfort and contribute to closing the disparity gap that currently exists. This study was limited by a lack of quantitative data of a comfort scale.

Keywords: Transgender, Osteopathic Manipulative Medicine, Chronic Pain

Adverse Childhood Experiences in Osteopathic Medical Students: Implications for Wellness, Resilience, and Training

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Introduction: Disturbingly high levels of burnout such as emotional exhaustion among medical trainees have prompted calls for action focusing on changing approaches to medical education. While many medical students appear resilient, research has identified personal characteristics associated with increased risk of poor mental health, including female gender, and those of ethnic minority. However, a personal history of childhood adversity is a risk factor that remains understudied.

Objective: The primary purpose of the study was to assess the prevalence of adverse childhood experiences (ACEs) in a cohort of osteopathic medical students and characterize their childhood protective factors. Also, provide a basic knowledge of ACEs and their effects on the brain.

Methods: The authors developed a 45-minute talk about ACEs and their effects on the brain as well as an adapted ACEs anonymous survey that was distributed to osteopathic medical students from all levels of training in the Tulsa and Tahlequah campuses. The survey included the 10-item ACE Study questionnaire, a list of childhood protective factors (CPF), and questions to assess students' perception of the impact of ACEs on their physical and mental health. The medical school's IRB approved the student survey as an exempt study. The authors computed descriptive and comparative statistical analyses.

Results: A total of 88 participants from the Osteopathic Medical School were surveyed, 77.3% from Tulsa and 22.7% from Tahlequah. Of those 12.5% were American Indian, 10.2% black. Demographics race was 67% white, 12.5% Hispanic and 80.7% not Hispanic. Participants came from 60.2% urban and 39.8% rural background. Our surveyed population was equally gender with 56.8% male and 43.2% female. 95.5% of our participants expressed having siblings and 95.5% of them were not fulfilling any caregiver responsibilities, suggesting full-time commitment to medical school.

43% of students surveyed scored mild anxiety, 47% moderate anxiety, and 9% moderately severe anxiety. There were no significant differences between females (6.82) and males (6.10) participants, on the average score of GAD7 anxiety self-report.

All participants (88 students) completed the ACES questionnaire. Fourteen students (15%) reported zero exposure ACES score, sixteen students (18%) reported at least one ACE exposure, forty-nine students (55%) reported ≥ 4 exposures, and nine students (10%) reported ≥ 6 exposures. The latter were all female. Female medical students showed significantly higher ACE score values than their male counterparts [One-way ANOVA [F=9.68, df(1,86), p<0.01]] post-Tukey HD p<0.001]. No significant correlations were found between ACE scores and GAD7 self-report levels.

Before the ACES and brain effects talk, 42% of participants considered that the ACES impact on brain and behavior was important for their knowledge as future clinicians, after the training, 95% of participants considered that ACES have an impact on the brain and behavior, and it is very important to train and educate future clinicians on how to identify ACES.

Conclusions: A sizeable group of medical students reported exposure to multiple ACEs. Our findings, if replicated, suggest a significant vulnerability of these medical students to health risk behaviors, particularly in the female population. When asked, the majority of participants demonstrated interest in including ACES training in their curriculum as osteopathic medical students.

Keywords: adversity, protective factors, ACEs, osteopathic medical students

Exploring Protein-Protein Interactions of the TCS (Thrombospondin-I, Cysteine-rich, and Spacer domains) Region of ADAMTS7 through Yeast Two-Hybrid System

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Background: Coronary artery disease (CAD) remains a leading cause of mortality and morbidity globally, imposing a significant burden on healthcare and individuals alike. The ADAMTS7 (A Disintegrin And Metalloproteinase with ThromboSpondin motifs 7) gene locus has been implicated in the progression and pathogenesis of atherosclerosis or CAD. A distinctive feature of ADAMTS7 is the presence of the Thrombospondin, Cysteine-rich, Spacer domain (TCS) within its structure. The TCS domain is believed to play a crucial role in substrate binding and specificity of ADAMTS7, yet the specific molecular interactions involving this region remain largely unexplored. This study aims to screen and identify potential biological interacting partners of the TCS-encoding region of ADAMTS7 using the Yeast Two-Hybrid (Y2H) system to understand the role of ADAMTS 7 in the progression of atherosclerosis.

Methods: The TCS region of ADAMTS7 was cloned into the plasmid pGBKT7 (bait) which encodes the GAL4 DNA-Binding Domain region. It was then transformed into the Yeast 2 Gold strain and mated with the Y187 library strain that contains the plasmid pGADT7(prey) which encodes for the GAL4 DNA-Activation Domain fused with heart cDNA isolated from CAD patients. After the mating procedure, the yeast cells were subjected to various screening processes using the dropout media containing X-alpha gal and aureobasidin to find the biological interacting partners. Subsequently, prey plasmid transformants were selected using the dropout media (DDO/X, QDO/X, SD/-Leu) and plasmids were extracted using a yeast plasmid extraction kit (Takara) and then sent for sequencing at Oklahoma State University DNA Protein Core Facility in Stillwater. The positive interactions were validated as genuine by using the recommended co-transformation procedure.

Results: Through Yeast two-hybrid screening, we identified six hundred possible interacting clones that encode for different substrates that need to be sequenced. Two potential substrates already have been identified to belong to the tetraspanin and heat shock protein families. Additional validation work is needed to ascertain the nature of interactions.

Conclusion: The Yeast Two-Hybrid System is a useful tool to screen protein interaction partners for a known protein. Our preliminary data are promising for possible biological interaction partners of the proatherogenic metalloprotease ADAMTS7.

The relationship between hip range of motion and shoulder injury in adolescent baseball athletes

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Introduction/Objectives: In the United States alone, baseball is one of the most common sporting events that adolescents take part in. Annually, over 5 million adolescents participate in baseball. Throwing a ball puts an immense amount of stress onto the upper extremities, especially the shoulder. If there are deficiencies at any point during the throwing motion, the stress placed on the shoulder will grow even more. This compensation could possibly originate from the hip and the joints' range of motion. Decreased range of motion could lead to poor mechanics and an increase of pain in the shoulder during the throwing motion. The purpose of this critically appraised topic is to investigate the correlation between shoulder pain during the throwing motion and a decreased amount of hip range of motion.

Methods: Five studies looked at how the throwing mechanics of adolescent baseball athletes could be causing shoulder pain. Each study utilized goniometry to determine hip range of motion of each subject and a specific self-reported pain rating questionnaire to determine the subjects shoulder pain. Each study included participants under the age of 18, did not have a previous history of shoulder injuries, genetic disorders affecting the musculoskeletal system, and included field players as well as pitchers.

Results: Four of the five studies agreed that there is a correlation between a lack of normal hip range of motion and shoulder pain during the throwing mechanics of adolescent baseball athletes. Overall, the lack or limited hip range of motion could be associated with shoulder pain or injuries.

Conclusions: In all the studies included in this synthesis, subjects in the adolescent age range with no related, previous history of injury to the shoulder were assessed for complaints of pain. Each study utilized goniometry to measure hip range of motion and a self-reported pain scale. 4 of the 5 studies included were supportive of the notion that a deficiency in hip range of motion could lead to compensation patterns that contribute to shoulder pain in adolescent baseball athletes.

Keywords: Hip range of motion, shoulder injury, shoulder pain, baseball, adolescent, baseball athletes

The Stratigraphic Position of a Dinosaur Quarry at Black Mesa, Kenton, Oklahoma

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Background: The Homestead Quarry is a paleontological quarry located at Black Mesa where fossils of Jurassic invertebrates and vertebrates, including dinosaurs, have been unearthed. Present-day, the quarry is located below the mesa, where a landslide occurred within the past 2ky. Its location suggested two hypotheses of original location: firstly, the quarry may be in its original position. Alternatively, it may have been displaced less than ten meters during the landslide. This project sought to determine the position of the quarry block relative to the adjacent mesa by attempting to correlate geologic beds from one site to the other.

Methods: Two trenches were excavated during a 2-week period to reach fresh exposures of Jurassic rock. The first trench was located below the Homestead Quarry; the other trench was located to the north on the mesa. 0.3-1.5 m of soil was removed to reach in-situ beds. The mesa trench was discontinuous due to rock fall. GPS coordinates were recorded at the top and bottom of the trench. Stratigraphic sections were recorded; the thickness of each bed was surveyed using a Jacob's staff and pocket transit. Description of beds included color, grain size, hardness, and documentation of fossils or sedimentary structures. Comparisons of the two described sections were made.

Results: The presence of kaolinite below the quarry indicates the quarry is within the Cimarron or Boise Member of the Morrison Formation. The lack of chert means that the quarry cannot be in the Cimarron Member. The lack of kaolinite or lake sediments in the mesa trench is unexpected, as the elevation indicated by a GPS reading and surveying suggested that the trench was being dug at and above the same elevation as that of the quarry. We could not locate sediments correlating those in the Homestead quarry to those on the mesa.

Conclusions: The geologic beds of the Homestead Quarry could not be correlated to those of the mesa. This was surprising and contradicted the previous ideas of the quarry's stratigraphic position. We now have two new hypotheses: the quarry was likely either greatly displaced vertically in a landslide, much more than previously thought; or a fault between the mesa and the quarry has displaced it in space. Faulting is very common in this area due to tectonic uplift and volcanic activity. More work needs to be done to determine the reason for the differences observed between the Homestead quarry sediments and those of the adjacent mesa.

Keywords: Morrison Formation, sedimentology, Lake Stovall

The Impact of Protective and Compensatory Experiences (PACEs) on Resilience in Adults with Substance Use Disorder

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Introduction: Treatment models for substance use disorders are continually evolving, often placing a heavy emphasis on the role of self-agency, a capacity often shaped by the patient's upbringing and ability to overcome adversity. Many studies show a well-defined connection between Adverse Childhood Experiences (ACEs), resilience, and substance use disorders later in life. However, there is little research into how these childhood experiences shaped those individuals who went on to develop a substance use disorder. Individuals with higher resilience have experienced more positive treatment outcomes, like prolonged periods of abstinence and lower relapse risks. Therefore, our study's objective is to examine the correlation between PACEs and resilience in patients undergoing treatment for a substance use disorder.

Methods: We conducted a cross-sectional analysis of data collected from participants in the Project CANARY (Clinical and Neurological Augers of Recovery) registry which consists of adults currently in treatment for a substance use disorder. Data was collected through self-report surveys, including demographic information, PACEs, and the Connor-Davidson Resilience Scale (CD-RISC). Pearson Correlations assessed the impact of these PACEs experiences on resilience from the CD-RISC. Post-hoc analysis examined the difference in PACEs groups ± 5 PACES, 1 standard deviation below the mean.

Results: Our analysis revealed a significant correlation between high PACE scores and increased resilience in adulthood (r=0.26, p=0.006). Participants with higher PACE scores (>5/10) demonstrated higher resilience scores, while less ACES is not significantly correlated.

Conclusions: The study's findings show a significant correlation between PACEs and resilience in adulthood, underscoring the importance of nurturing positive childhood environments. Though adverse childhood experiences have long-lasting impacts, the presence of protective and compensatory experiences from childhood play a crucial role in bolstering resilience, thus offering valuable insights for potential therapeutic approaches in substance use recovery and mental health interventions. This could include future research into how newly acquired positive and protective experiences in adulthood, such as volunteering or a new hobby, could contribute to the patients' ability to recover. The study advocates for a balanced perspective in childhood experience research, emphasizing not only the mitigation of adversities but also the promotion of positive experiences for long-term resilience and well-being.

Keywords: Substance Use Disorder, PACEs, Resilience

Treatment of Malaria in Pregnancy: A Literature Review of Current Guidelines Across the Globe

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Introduction/Objectives: Malaria is estimated to be diagnosed in approximately 25% of pregnancies in endemic areas worldwide. In 2023, the USA had its first confirmed cases of locally acquired malaria in 20 years. With changes in climate leading to changes in tropical diseases, it is important to stay ahead of the most up-to-date treatment recommendations worldwide. The objective of this paper is to compare the most up-to-date recommendations for treatment of malaria in pregnancy in different parts of the world.

Methods: A literature review was conducted from the American College of Gynecology (ACOG) guidelines, World Health Organization (WHO) guidelines, Center for Disease Control (CDC), Infectious Disease Society of America (IDSA), American Academy of Pediatrics (AAP) & Government of Malawi Ministry of Health (MMH) Guidelines for the treatment of an active malaria infection in pregnancy. Recommendations were compared and contrasted.

Results: Upon review of these institutional recommendations, several discrepancies were noticed. The WHO guidelines have recently been updated and while the CDC has adapted these updates and the AAP has published an article about this, the Malawi Ministry of Health still uses outdated recommendations. The ACOG and IDSA do not have any current recommendations for the treatment of malaria in pregnancy.

Conclusions: In conclusion, the WHO has completed the most recent research on treatment of malaria in pregnancy and has the most up-to-date treatment recommendations. It is important that American and Malawian medical societies consider adapting the most up to date recommendations for the treatment of malaria in pregnancy.

Keywords: malaria, pregnancy, global health

A Case of Idiopathic Anaphylaxis with Elevated Liver Transaminases

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Background: Complications from a cholecystectomy are rare, especially with recurring episodes of anaphylaxis and urticaria. Anaphylaxis is an allergic reaction caused by an allergen, which may include: foods, venoms, medications, infections, among others. Idiopathic anaphylaxis (IA) is a severe allergic reaction with no know cause or etiology. This article describes a patient who presented with anaphylactic episodes following a laparoscopic cholecystectomy. We discuss the symptomology of the episodes and the eventual treatment, and we have also put forth a possible mechanism for why this patient was experiencing these episodes.

Case Presentation: A 48 year old female presented to her primary care physician with complaints of mid thoracic back pain. Therapy and other conservative treatments such as pain medications did not relieve her symptoms. An MRI was later performed that showed cholelithiasis (CL). She was referred to a general surgeon for a subsequent cholecystectomy in December 2013. This was performed laparoscopically. A few hours later developed itchy urticaria and anaphylactic symptoms. She was treated for the acute reaction and was discharged. Many years went by with these random episodes that presented as epigastric pain just below the xiphoid process that would radiate posteriorly with accompanying itchy urticaria and anaphylaxis. After one of her episodes an Magnetic Resonance Cholangiopancreatography (MRCP) was performed that showed a slightly torturous and dilated bile duct. In 2018 an ERCP demonstrated a sphincter of Oddi dysfunction that was released with surgery. She had one more episode after she awoke from anesthesia and has been symptom free for almost six years.

Discussion: The following is a proposed mechanism of symptomology based upon data and evidence showed elsewhere in literature. The LC or a gallstone moving through the sphincter of Oddi (SO) caused the SOD. The SOD was the causal factor in the elevation in liver transaminases, which in turn caused the radiating epigastric pain and might have also caused urticaria and anaphylaxis. It remains to be seen why the SO release has correlated with this patient not experiencing her anaphylactic episodes for the last five years (2018-2023). While it is inconclusive, it is suggestive that since the SO release has resolved the patient's symptoms, lends credibility that the anaphylactic reactions were related to her SOD. More study is warranted to find a possible correlation between SOD, elevated transaminase levels, and anaphylaxis to determine whether these symptoms are associated in humans.

Examination of Immune Response to SARS-COV-2 in PBMCs and serum

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Globally, there have been nearly 800 million confirmed cases of Covid-19 and 13 billion vaccine doses administered. These exposures create T cell and B cell immune memory responses in individuals that protect against future infections. B cells create antibodies that circulate in the body and attach to the virus. Memory T cells recognize and kill infected cells while also recruiting other immune cells. Not all individuals have robust immune memory responses and immunity against SARS-CoV-2 typically declines after 3-15 months. We measured cellular and humoral (antibody) immunity against SARS-COV-2 in four vaccinated individuals in order to investigate a potential correlation between the number of T-cells that are reactive to SARS-CoV-2 peptide and the serum concentration of Sars-CoV-2 antibodies. Peripheral Blood Mononuclear Cells (PBMCs) and serum samples were collected from 4 healthy adult females who had had 3 doses of the Pfizer mRNA COVID-19 vaccine (Comirnaty) and at least one confirmed SARS-COV-2 infection. The number of SARS-COV-2 reactive T cells per 100k PBMCs was determined using ImmunoSpot® Human INF-y Single-Color Enzymatic ELISPOT Assay. Thawed PBMCs were counted for viability and rested overnight (37°C; 5% CO2). The cells were plated at concentrations ranging from $5x10^5$ to $1x10^5$ cells/well, with SARS-COV-2 peptides (Miltenyi Biotech) or pos/neg controls. After an 18-hour incubation, plates were processed according to the manufacturer's protocol to determine the number of IFN-y producing cells. Spots were imaged and counted on a CTL ImmunoSpot® S6 Ultra analyzer, then adjusted to spots per 100k cells, correcting for background activation. The serum concentration of SARS-COV-2 IgG Antibodies was determined using RayBio® COVID-19 N and S1 TND protein Human IgG ELISA Kit. Thawed serum was diluted 1:1500. The ELISA was processed according to manufacturer's protocol. Optical density (OD) at 450nm was measured using a Synergy 2 microplate and compared to a standard curve. PRISM was used to extrapolate the unknown values of the serum samples and reported in units/mL serum. Although we expected that antibody concentrations and T cell counts would be positively related to each other, in our small sample, there was no discernible relationship. Furthermore, we expected that the number of days since last exposure (either illness or vaccine shot) would be negatively related to measures of immune memory. Once again, there was no such relationship in our data. These results show that the immune memory response can vary between individuals and that one measurement cannot be used to predict the other. However, due to our small sample size, our conclusions cannot be said to represent the population at large. Both measures of adaptive immune memory are known to peak shortly after exposure and gradually decline over months and years.

Impact of implementation of a Breastfeeding Education program: An Observational Study

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Introduction/Objectives: Among children born in 2019, only 77% reported having ever been breastfed in Oklahoma, while the national average of that year was 83%. These reported rates expose the gap in breastfeeding in Oklahoma. Specifically, in Cherokee County within Oklahoma, that percentage is 78%. This deficit in the percentage of breastfed infants in Oklahoma is significant because breastfeeding provides an array of health benefits to both baby and mother. In babies, breast milk provides essential nutrients and natural passive immunity. Breastfeeding has also been shown to reduce the risks of asthma, obesity, and type I diabetes. It benefits the mother breastfeeding by reducing the chances of high blood pressure, type 2 diabetes, ovarian and breast cancer. While breastfeeding is the gold standard for infant nutrition, there are several barriers to breastfeeding that the mother can face that should be considered. Issues like latching, concerns for the infant's weight and growth, the limited choices of medications that the mother can use, lack of support from family or in the workplace, lack of education about breastfeeding, and cultural stigmas all contribute to if or how prolonged breastfeeding occurs.

Methods: To encourage the increase in breastfeeding among newborns in Cherokee County, specifically the town of Tahlequah, Oklahoma, a program has been implemented to provide educational sessions to inform expecting mothers who are in their third trimester of the benefits of breastfeeding and teach best-practice techniques. Participants are gathered by flyers advertising the details of the program and a QR code that will link to a survey where their contact information can be submitted to track interested participants for follow-up. Pre- and post-program surveys are given to each participant to document demographic information such as age and ethnicity, how they feel about breastfeeding, their reasons for breastfeeding, if they intend to breastfeed their child, and if they have initiated breastfeeding after the program. The program uses an evidence-based curriculum to teach participants how to breastfeed with models and dolls for a hands-on approach. Each cohort consists of a 4-week long curriculum that includes three educational sessions and a question-and-answer portion.

Results: The implemented breastfeeding program is ongoing, and data is still being collected. Three cohorts made of six participants total have completed the program at this time.

Conclusions: The goal of this study is to highlight the impact of the breastfeeding education program in Tahlequah, Oklahoma by evaluating the initiation rates of breastfeeding among participants of the program. The purpose of this presented data is to showcase the midpoint progress that has been made.

Keywords: breastfeeding, education, Oklahoma

An Assessment of Emotional Intelligence in Medical, Physician Assistant, and Athletic Training Students

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Introduction/Objectives: Research suggests that a key piece of any successful patient-provider interaction is emotional intelligence (EI), or the awareness of one's emotions and the ability to manage them competently. It has been suggested that EI is declining amongst healthcare professionals. This study sought to evaluate the differences in overall EI among medical (MS), athletic training (AT), and physician assistant (PA) students in their first- and second-year of training, with additional emphasis on gender identity and race/ethnicity.

Methods: EI questionnaires were collected via the Schutte Emotional Intelligence Scale (EIS). Two one-way ANOVAs were conducted to determine mean differences in EI and academic program and year in school. Kruskal Wallis tests were conducted to evaluate EI and gender identity and race/ethnicity.

Results: No significant differences were observed in mean EI in degree program (MS, AT, and PA) or year in school (first and second). However, significant differences were observed in males, scoring higher than females, and across racial/ethnic subgroups.

Conclusions: This study demonstrates EI differences in men and women that do not agree with previous literature, worthy of further exploration. Differences in EI among various racial/ethnic groups suggests that EI is related to cultural factors. EI implementation in curricula should be culturally competent in order to maximize effectiveness and improve future patient care.

Keywords: patient-centered care, patient-provider interaction, emotional intelligence

**Exploring Clinical Trialists' Perspectives on Core Outcome Sets for Anxiety Trials:
A Web-Based Survey Study**

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Importance: Without a consistent set of outcome measures in clinical trials, it is challenging to draw meaningful comparisons and make informed decisions regarding the most effective interventions for anxiety disorders. In an attempt to enhance research quality, a core outcome set (COS) for anxiety disorder was established in 2017 with the goal of improving the quality and comparability of clinical trials focused on anxiety disorders. The COS established a standard set of outcomes expected to be measured by trialists specifically when studying interventions related to anxiety disorders. Our study aimed to investigate the perception, knowledge and utilization of the core outcome sets by lead investigators in clinical trials of anxiety disorders.

Design: In this cross-sectional analysis, participants consisted of clinical trialists involved in the design, administration, or analysis of clinical trials studying anxiety disorders. Using the secure web-based data collection tool REDCap, we formulated a comprehensive survey consisting of 20 questions aimed to gather demographic information of participants as well as trialists familiarity with the anxiety COS. Responses will be collected for a total of eight weeks with bi-weekly reminders for surveys not already responded to. For quantitative data we will use both descriptive and inferential statistics to identify relationships between variables and a thematic analysis will be used to identify recurring patterns of open-ended responses.

Results: Data is currently being collected and what is currently available is only preliminary data.

Conclusion: The variation in outcomes reported across clinical trials poses challenges in synthesizing primary reports by systematic reviews. Implementing core outcome sets in clinical research has the potential to enhance the reliability and comparability of trial outcomes, benefiting evidence-based care for patients with anxiety disorders. However, understanding why trialists are or are not utilizing the core outcome sets is a pivotal first step in standardizing clinical trial outcome reporting.

Keywords: Core outcome set, anxiety, trialists, cross-sectional analysis

Computed tomography visualization of Wormian bones in the pen-tailed tree shrew (*Ptilocercus lowii*)

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Wormian bones are variably ossifying bones within the sutures of skulls. While widespread among mammals, they do not occur in every specimen of species that are known to form Wormian bones. While the exact reason(s) for why these bones form is unknown, it has been hypothesized that they may form due to prolonged cranial stress. Wormian bones in primates have been studied for over a century, but to our knowledge, they have not yet been reported from *Ptilocercus lowii* (Pen-tailed tree shrew), a member of Scandentia, a mammalian order sometimes recovered as an outgroup to Primatomorpha, the group that includes primates. We focused on two main questions: 1) How does the location and morphology of Wormian bones vary within *P. lowii*? and 2) Are the locations of the Wormian bones in *P. lowii* the same as in primates?

To examine tree shrew skulls for Wormian bones, we sourced computed tomography (CT) scans from Morphosource. The *Ptilocercus lowii* skulls are female specimens from different nature reserves in Malaysia. These scans were first viewed on surface meshes to search for Wormian bones. The CT scans with potential Wormian bones were then uploaded to Avizo 2020.1. Once in Avizo, modifications were made to the scan to better locate the Wormian bone. Avizo's transformation function was used to align the scan into anatomical position. The gamma filter was then applied to show only the whitest pixels. This technique ensured that only bone was visible and no debris from the scanning process was picked up in the image. Each slice of the CT scan was viewed in search of the potential Wormian bone before segmenting it manually using the Avizo paintbrush. The bone was then examined by all authors, and once it was agreed that it was indeed a Wormian bone, portions of the adjacent bones were segmented manually.

Both tree shrew specimens have Wormian bones, but they are not in the same location in the skull. Specimen USNM 481107 has a Wormian bone in the lambda (where the sagittal and lambdoidal sutures meet). This Wormian bone can also be classified as an interparietal. USNM 481103 has a Wormian bone in the suture between the frontal and nasal bones and lacks a bone in the lambda. Interestingly, both Wormian bones overlapped surrounding skull bones along parts of their sutures, a morphology not readily apparent from the external views alone. Wormian bones occur in similar locations in primates. These findings show that the locations of Wormian bones are variable within *P. lowii*; however, with only two specimens, it is difficult to draw firm conclusions about what this variation means. These data also show us that the locations are consistent among primates and at least one scandentian taxon, suggesting the possibility of a homologous developmental origin for these bones.

We plan to expand our sample to determine whether additional specimens will show consistent Wormian bone locations within *P. lowii* and to further compare the varying locations of Wormian bones in *P. lowii* to those of other mammals.

Keywords: tree shrew, skull, anatomy

Sociodemographic Disparities in Diabetic Eye Disease: Analysis of the 2021 Behavioral Risk Factor Surveillance System

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Purpose: Among the various manifestations of diabetic eye disease, diabetic retinopathy, a leading cause of preventable blindness, is estimated to impact more than 160 million individuals by 2045. Our objective was to provide an update and investigate the rates of diabetic eye disease by race/ethnicity, sex, socioeconomic status, education, and rurality. Additionally, we aimed to address a gap in research by investigating the rates of diabetic eye disease among the transgender population.

Methods: This study performed a cross-sectional analysis of the 2021 Behavioral Risk Factor Surveillance System to assess disparities in the prevalence of diabetic retinopathy by sociodemographic factors using X^2 tests.

Results: The sample included 21,905 participants and found the prevalence of diabetic eye disease was lower in females (17.34%) than males (20.14%), though the highest rate was observed in transgender participants (27.16%; P=.017). White individuals had the lowest prevalence of diabetic eye disease (16.57%)—with all other groups having a prevalence greater than 22% (P<.01). diabetic eye disease prevalence was inversely associated with income and educational attainment (P<.01). Differences in diabetic eye disease by rurality and insurance status were not statistically significant.

Conclusion: We found higher rates of diabetic eye disease in individuals who identified as Asian, as well as those categorized as "other" within the racial classifications, alongside transgender individuals. While these groups constitute a small proportion of the U.S. population, the observed disparities underscore the importance of heightened surveillance for diabetic eye disease within these demographics. It is essential to prioritize focused interventions aimed at preventing and managing diabetic eye disease among individuals in these groups affected by diabetes.

Keywords: Health Disparities, Diabetic Eye Disease

Potential Effects of Data Genocide on Rates of Adolescent Suicidal Ideation in Self-Reported AI/AN versus the *Raceeth* Variable: A Cross Sectional Analysis of the Youth Risk Behavior Surveillance System

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Background: Suicide is among the leading causes of death among children in the United States, ranking second among ages 10-14 and third among those 15-24. Non-Hispanic American Indian/Alaska Native (AI/AN) individuals are disproportionately impacted by suicide with a reported 28.1 out of 100,000 individuals dying from suicide. In an examination of suicidal ideation and suicide attempts among adolescent students aged 12-19 in the Minnesota Student Survey, individuals reported as AI/AN demonstrate elevated rates compared to other ethnic groups.[1] While current statistics indicate that the suicide rate is highest among non-Hispanic AI/AN, actual rates of suicide and suicidal ideation may vary due to the number of AI/AN individuals who are classified as multiracial. Thus, our primary objective was to compare the rates of suicidal ideation among adolescents using the calculated *raceeth* variable in the Youth Risk Behavior Surveillance System (YRBSS) to self-reported ethnoracial identity.

Methods: We conducted a cross-sectional analysis of the 2021 YRBSS survey to determine rates of suicidal ideation and suicidal attempts between AI/AN adolescents using the *raceeth* variable and self-reported ethnoracial categories that include AI/AN alone and in combination with other races—with and without Hispanic/Latino ethnicity (HL). We reported the sample rates and the population-weighted percentages using sampling weights and survey design provided by YRBSS.

Results: The population-weighted percentage of suicidal ideation for the AI/AN category of the *raceeth* variable was 27.3% and for suicide attempts was 21.85%— which corresponded to only those who self-reported as AI/AN alone (non-HL). Among other self-reported groups, those who only selected AI/AN race, but reported HL ethnicity, had rates of ideation and attempts of 25.1% and 22.13% respectively. While these groupings were similar, self-selected ethnoracial combinations with much higher percentages of suicidal ideation were AI/AN + White (HL) at 42.3%, AI/AN + Black or African American (non-HL) at 33.3%, and AI/AN + Black or African American + White (non-HL) at 41.05%. For suicide attempts, groups with the highest rates included self-reported as AI/AN + Black or African American + White (non-HL) at 43.6% and AI/AN + White (HL) at 32.43%.

Discussion: While the *raceeth* variable within YRBSS is in line with other national estimates of suicidality among AI/AN, our study demonstrates that those estimates are likely missing key segments of the AI/AN community. We found that rates of both suicidal ideation and attempts are much higher among adolescents reporting as AI/AN in combination with White with HL ethnicity and among who reported as non-HL, AI/AN in combination with Black or African American and White—both groups having rates 12-21% higher than AI/AN alone (non-HL) from the *raceeth* variable. Our study highlights the need for healthcare workers focused in pediatrics, family medicine, and psychiatry to be aware of these disparities, as well as the need for more public health research with an expanded view of Indigenous identity.

Keywords: Ethnoracial Disparities, American Indian/Alaska Native (AI/AN), Suicidal Ideation, *Raceeth* Variable, Data Genocide

Medicare Savings for Seizure Drugs by Adopting the Mark Cuban Cost Plus Drug Company Model

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Background: Epilepsy is often a lifelong diagnosis, requiring pharmacologic management in most cases. Despite the chronicity of this disorder and management, there has been a rise in medication cost over the years. To address this issue, Mark Cuban Cost Plus Drug Company (MCCPDC) has come out as a more affordable option to obtain patients' prescriptions. Focusing on epileptic medication, this study examines the potential cost saving benefit of MCCPDC compared to Medicare Part D plans.

Methods: We conducted a cross-sectional review identifying the price difference of anticonvulsants available on MCCPDC compared to the 2021 Medicare Part D spending data. Prices for both dispensing and shipping fees were recorded for the minimum quantity (30ct) and maximum quantity (90ct). We compared unit costs and total savings, and compared standardized unit prices for 30-day and 90-day periods between Medicare and MCCPDC drugs.

Results: Of the 16 anti-seizure medications shared between MCCPDC and Medicare, Medicare spending reached nearly $1 billion. Analyzing 30ct prescriptions, potential savings in 60% of drugs amounted to $172 million on MCCPDC, but the average cost was 14.85% higher than Medicare. For 90ct prescriptions, savings were $373 million in 80% of drugs, a 31.63% reduction compared to Medicare prices.

Conclusion: Our study highlights the potential savings with MCCPDC, especially among the 90ct medications, demonstrating that a cheaper alternative to chronic medications is possible if the pricing of MCCPDC is used in lieu of Medicare. We recommend that physicians educate patients on MCCPDC and their specific medications to find more accessible pricing. MCCPDC could alleviate financial burdens and enhance access to essential medications for patients, especially in the context of the increasing Medicare-enrolled population.

Keywords: Medicare, Anticonvulsants, Cuban, Cross-sectional review, Epilepsy

An unexpected presentation of Stress Cardiomyopathy

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Background: Stress Cardiomyopathy (Takotsubo Cardiomyopathy) is a form of dilated cardiomyopathy that classically occurs in women, many of whom are postmenopausal. Typical signs include mild troponin elevation and ECG changes suggestive of anteroapical myocardial injury, even in the absence of significant coronary artery disease. Echocardiogram or ventriculography is required for diagnosis and most typically demonstrates a regional pattern of LV apical ballooning with relative sparing of contractile function at the base. The gold standard treatment is conservative therapy with incorporation of guideline directed medical therapy. Overall the prognosis is very good and often time will see resolution of their cardiomyopathy with time. In this case report, we discuss a very rare presentation of takotsubo cardiomyopathy making diagnosis and treatment challenging.

Case Presentation: A 62 year old female with a past medical history of essential hypertension, hyperlipidemia presented for constitutional symptoms including weakness, body aches. Patient underwent a CT of the chest and abdomen that incidentally discovered the patient to have situs inversus. Patients hospital course was remarkable for respiratory failure and subsequent PEA cardiac arrest. Successful return of spontaneous circulation was achieved and patient was found to have dynamic ST-elevations and a troponin that peaked at 7.98. Patient was emergently taken for left heart catheterization. Anatomical assessment was extremely challenging given patients rare anatomy however a pigtail catheter was utilized for a ventriculogram which revealed apical ballooning consistent with takotsubo cardiomyopathy. Patient underwent continued aggressive medical therapy and was ultimately dispositioned in stable condition.

Discussion: This case presentation demonstrates an extremely rare anatomic presentation in situs inversus. Situs Inversus is a rare but important genetic condition in which the organs of your chest and abdomen are positioned in a mirror image of the normal human anatomy. Although extremely rate, the operator must be prepared for all unique anatomical variants such as situs inversus in order to quickly define coronary anatomy and ventricular function in order to make appropriate medical decisions for your patients. Despite the complexity of the case the operator was able define the ventricular wall motion with a pigtail catheter that revealed classic apical ballooning motion. In addition as there was no significant disease appreciated in the coronary system this patient was given a diagnosis of takotsubo cardiomyopathy. This patient underwent conservative therapy with initiation of guideline directed medical therapy in which she tolerated well and was ultimately discharged from the hospital in stable condition. The patient was seen in the outpatient setting roughly three months later and underwent a repeat echocardiogram which revealed recovery of her ventricular function. This case demonstrates how patients will usually have recovery of their ventricular function with conservative therapy. In addition, despite the patients extremely rare anatomic orientation a diagnosis should still be made with utilization of ventriculography and assessment of coronary artery disease with coronary angiogram.

Keywords: Situs Inversus

Multimodality Imaging Approach to Treatment in Spontaneous Coronary Artery Dissection

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Background: Spontaneous coronary artery dissection (SCAD) is the spontaneous separation of the layers of the epicardial coronary artery wall by intramural hemorrhage that is not associated with atherosclerosis, iatrogenic injury, or trauma. The gold standard for diagnosis is coronary angiography however often times requires multi-modality imaging approach with cardiac computed tomography angiography (CCTA). Often times ultimate therapy involves conservative management pending stability of patient. In this case report we discuss how a multi-modality imaging approach can assist in both diagnosis, treatment, and monitoring of SCAD.

Case Presentation: A 32 year old female with a past medical history of tobacco abuse who originally presented as an inpatient for class II chest pain with associated recent intense workouts. Patient was found to have a NSTEMI with a troponin that peaked at 4.68.

Given patients age and overall lack of significant risk factors patient underwent further stratification with a CCTA which demonstrated severe anatomical stenosis of the proximal left anterior descending (LAD) artery 70-99%. Given these findings patient subsequently underwent left heart catheterization. Upon coronary angiogram patient was found to have an intimal flap which extended from the proximal LAD into the left main (LM) artery. As the patients chest pain had resolved at the time of the heart catheterization, lack of dynamic EKG changes, and overall hemodynamic stability patient was treated conservatively with medical therapy. Patient subsequently underwent repeat coronary angiogram 72 hours later which showed consistent findings confirming diagnosis of SCAD. Patient was initiated on dual antiplatelet therapy and statin and discharged in stable condition. Roughly a month post discharge patient underwent repeat CCTA which revealed significant improvement in previously appreciated intimal flap.

Discussion: This case report demonstrates a presentation of SCAD with commonly associated demographics of a young otherwise healthy female. SCAD is commonly associated with intense emotional stress or physical exertion. SCAD is often associated with non-coronary arteriopathies including fibromuscular dysplasia and cerebral aneurysm. There are three major types of SCAD in which our patient demonstrated type I which is defined by contrast staining of the arterial wall with a radiolucent flap present. Our case demonstrated a good utilization of a multi-modality imaging approach with both coronary angiogram and CCTA. CCTA has emerged as an appropriate non-invasive imaging choice for many diagnosis, including SCAD. This patient displayed a good outcome with initial diagnosis via coronary angiogram and continued non-invasive monitoring in the outpatient setting with CCTA. Ultimately, the appropriate management plan is debated however given the overall stability of the patient percutaneous coronary intervention of these lesions can be extremely challenging and lead to worse outcomes. Thus, appropriate treatment has shifted to conservative therapy with 30 days of dual antiplatelet therapy and avoidance of strenuous activities.

Keywords: Spontaneous Coronary Artery Dissection

Association between ACEs and the prevalence of specific negative childhood behaviors

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Background: Adverse childhood experiences—stressful or traumatic events that occur to children during their development—are frequently associated with adult substance use, injury, violence, and a lower life expectancy, but also have been shown to have an immediate impact on negative behaviors during childhood. Insight into the association between ACEs and the presence of specific negative behaviors within conduct disorder diagnostic criteria has been understudied. Thus, our primary objective was to investigate the association between ACE scores and various negative childhood behaviors.

Methods: We performed a cross-sectional analysis of the 2022 National Health Interview Survey for Children. After calculating cumulative ACEs among respondents, which were categorized from 0 ACEs, 1-3 ACEs, and 4+ ACEs, we reported the prevalence of negative behaviors among ACE categories among children 5-17. We then used binary and multivariable logistic regression to measure, via odds ratio (OR) and adjusted odds ratios (AOR), the increased likelihood for individuals with higher ACEs to display negative behaviors.

Results: Increasing ACEs was found to be significantly associated with decreased reporting that the child aged 5-17 shares toys/games (P < .001), and is generally well-behaved (P = .015). Increased ACEs was also associated with increased rates of the child losing their temper often (P < .0001), fighting with other children (P < .0001), often lying or cheating (P < .0001), stealing (P < .0001), and having difficulties with emotions (P < .0001). Two traits were found not significantly associated with ACE scores: being considerate of others' feelings (P = 0.58), and being helpful when someone is hurt, upset, or ill (P = 0.53). Further, our logistic regression found that compared to children with 0 ACEs, individuals with 4+ ACEs were more likely (AOR: 5.75; 95% CI: 3.68-8.98) to be reported as having difficulties with emotions, stealing (AOR: 5.46; 95% CI: 2.69-11.09), and fighting with other children (AOR: 4.96; 95% CI: 2.87-8.56).

Conclusion: Insight into how adverse childhood experiences are associated with specific behaviors, can provide insight for caregivers and healthcare providers into these behaviors, and how they contribute to the overall behavioral disorder. This understanding can provide points for more specific and personalized intervention strategies. Further insight into how the prevalence of these behaviors develops as the child ages could provide further insight into the ideal timing of intervention strategies.

Keywords: ACEs; Negative Childhood Behaviors; Conduct Disorder

Morphine' Effect on Inflammation and Gls1 gene in IEC18 Cells.

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Introduction: IEC18 Cells are epithelial cells that represent the innermost lining of the colon. We are using these cells to study Inflammatory Bowel Disease (IBD). IBD is an excessive inflammatory response in the colon. The Gls1 and MeCP2 genes are an important part of the inflammatory response in cells. Morphine is known to have immunosuppressive and anti-inflammatory effects in many cell-types, macrophages for example. While morphine has many unwanted side-effects, there may be some circumstances where treating IBD with morphine is practical. A meta-analysis in 2021 found that 21% of outpatients with IBD and 62% of hospitalized IBD patients use opioids. In this experiment, we looked at how effectively morphine counters inflammation in IEC18 cells.

DNA methylation is one of the epigenetic mechanisms that our cells use to regulate gene transcription. MeCP2 and other proteins bind to methylated promoter regions and inhibit gene expression. Previous experiments in the lab have shown that Gls1 is an exception where MeCP2 interacts with co-activators and increases gene expression.

Methods: Intraepithelial cells-18 were used in this study. Cells were treated with 2,4,6 trinitrobenzenesulfonic acid (TNBS). Azacytidine is used in this study as a demethylating agent. DNA and RNA were extracted from the treated cells and were analyzed for methylation status of the Gls 1 gene.

Results: Azacytidine treatment reduced DNA methylation and thus can be used as a possible treatment for IBD patients.

Glutaminase 1 gene is upregulated in IEC18 Cells During Inflammation

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Introduction: Inflammatory bowel disease (IBD), referring to two specific diseases: Crohn's disease and ulcerative colitis, is a condition characterized by chronic inflammation caused by the immune system attacking the GI tract, eventually resulting in damage. The prevalence of IBD within the United States is particularly alarming with about 3.1 million adults having been diagnosed. In addition, IBD is commonly treated with narcotics, an addictive group of drugs with the potential to subject the patient to dependency and neurological implications. A more desirable approach would be to utilize epigenetics, altering gene expression without manipulating the gene sequence, to treat IBD without such implications. One such epigenetic modification of interest is DNA methylation, in which a methyl group is transferred to the carbon 5 position of cytosine by an enzyme called DNA methyltransferase from a compound called S-adenosylmethionine (SAM) already residing in the cell. Usually, methylation observed in a gene leads to its suppression. However, a paradoxical effect is observed when administering trinitrobenzenesulfonic acid (TNBS) to the intraepithelial cells in the colon of the rat where hypermethylation of the glutaminase1 (*Gls1*) gene results in activation or upregulation. The *Gls1* gene codes for GLS1 protein which is the enzyme responsible for converting glutamine to glutamate, a neurotransmitter. In this study, we utilized TNBS to induce inflammation in intestinal epithelial cells (IEC18) of a rat and observe hypermethylation in the *Gls1*gene, specifically to replicate findings from previous studies using rats in cell culture. IEC18 cells are present in the outermost layer of the colon, the mucosa layer, and are the most exposed cells to TNBS.

Methods: Intraepithelial cells-18 were used in this study. Cells were treated with 2,4,6 trinitrobenzenesulfonic acid (TNBS). Azacytidine is used in this study as a demethylating agent. DNA and RNA were extracted from the treated cells and were analyzed for methylation status of the Gls 1 gene.

Results: TNBS treatment upregulated Gls1 gene in IEC18 cells and TNBS treatments also increased Gls1 gene DNA methylation status.

Exploring Clinical Trialists' Perspectives on Core Outcome Sets for Immune Thrombocytopenic Purpura Trials: A Web-Based Survey Study

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Introduction: Immune Thrombocytopenic Purpura (ITP) is a complex autoimmune disorder associated with a low platelet count, and elevated bleeding risk. Conducting clinical trials in ITP is vital for comprehending the disease and improving patient outcomes. However, diverse outcome measures across trials impede result comparison, necessitating the use of Core Outcome Sets (COS). COS are specific trial outcomes for uniform measurement and reporting, aiming to enhance research quality, evidence synthesis, and patient-centered outcomes. Despite potential benefits, COS adoption in the ITP clinical trial community remains inconsistent. This cross-sectional, web-based survey investigates clinical trialists' perceptions, knowledge, and usage patterns of COS in ITP research. Our objective is to obtain insight on the awareness, integration, barriers, and recommendations for ITP COS. This study's insights aim to inform strategies for enhancing COS adoption, advancing standardization in ITP trials, and optimizing therapeutic intervention evidence.

Methods: Using a sample of ITP trials from a previous study, eligible participants are identified from the 'Contacts and Locations' section of ClinicalTrials.gov registry profiles. The survey, conducted via REDCap, consists of 20 questions covering demographic information, COS familiarity, and practical experiences with COS. Questions vary in format, including multiple-choice, Likert scale, and open-ended, allowing for both quantitative and qualitative data collection. Informed by the COMET Initiative's core outcome set database, the survey addresses awareness, knowledge, use, and perceptions of COS in ITP trials. Data collection occurs through an eight-week email-based process, ensuring participant anonymity and confidentiality. The analysis, combining descriptive and inferential statistics, as well as thematic analysis of qualitative data, aims to provide a comprehensive understanding of clinical trialists' perspectives on COS in ITP trials. Data analysis will include descriptive and inferential statistics, as well as qualitative data obtained from open-ended questions.

Results: Data is currently in the collection phase of this study. Analysis of survey responses will include:

1. Descriptive statistics: summarizing patient demographics and responses to close-ended questions.
2. Inferential statistics: examples include chi-square tests and t-tests which may be used to identify relationships between variables or differences among subgroups.
3. Qualitative data: derived from responses to open-ended questions, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusion: Upon concluding this study, our findings will provide insights into the utilization and awareness of Core Outcome Sets among clinical trialists. The knowledge acquired from this research may establish a basis for forthcoming initiatives and interventions dedicated to improving the adoption of COS within the clinical trial community. Furthermore, these outcomes have the potential to foster consistency in clinical reporting of COS, ultimately contributing to enhanced patient outcomes for ITP patients.

Keywords: Immune Thrombocytopenic Purpura, Core Outcome Sets, Clinical trials

Why Walk With a Doc? Initial findings suggest the importance of social connection

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Background: It is widely known that regular physical activity is important to overall health and well-being. In Cherokee County access to exercise opportunities is not widely available compared to the State of Oklahoma and nationwide. To combat lack of access and provide health education, a Tahlequah chapter of Walk with a Doc (WWAD) began in July 2023 in partnership with Oklahoma State College of Osteopathic Medicine at the Cherokee Nation, Northeastern Oklahoma Community Health Centers, and Cherokee County Active Living and Transportation Committee. WWAD is an international nonprofit organization founded in 2005 by board-certified cardiologist Dr. David Sabgir, MD. Dr. Sabgir envisioned a program that provides communities with recurring opportunities to engage in physical activity, while creating an inclusive environment for conversation with local medical providers. Our objective is to investigate the reason individuals chose to participate in the program and initial impacts to inform future health program design.

Methods: Adult (18+ years of age) participants of WWAD Tahlequah were emailed an electronic RedCap survey. The 41-question survey included demographics, health information, physical activity levels, reasons for and impacts from participating in WWAD, along with questions pertaining to loneliness, hope, and quality of life. Format included multiple choice, checkboxes, sliding scales, and free text. This is the initial survey collection of a longitudinal study.

Results: The survey yielded 24 respondents, predominantly females (n=17) across various age groups ranging from 18-75 yo; the largest age group was 26-35 yo with 8 respondents. 50% of respondents (n=12) entered this WWAD program already meeting the AHA weekly physical activity recommendation of either 150 minutes of moderate-level activity or 75 minutes of vigorous-level activity. 100% of respondents are satisfied/very satisfied with the program and 66.7% (n=16) declared their physical activity levels have increased since starting the WWAD program. When asked to mark any choice for the reason(s) they chose to participate in WWAD, the top 3 choices that received a yes from over 50% of respondents included: "to spend time outside" (n=18), "to enjoy the company of others" (n=15), and "to support a friend/family member" (n=13). Questions pertaining to participating for physical activity reasons yielded "no" from the majority of respondents (i.e., "to reach my physical activity goals", 'no' n=19, 79%).

Majority of respondents agreed/strongly agreed that the WWAD program provides social connectedness and improves energy levels, to include: "gives me a chance to socialize" (n=23), "I feel more connected with members of my community" (n=22), and "Increases my energy levels after the group walks" (n=22).

Conclusions: Results from our initial survey indicate participants value the opportunity to socialize that WWAD presents over achieving physical activity goals. These results may be biased due to small sample size and participants completing daily physical activity goals outside of WWAD. Moreover, a recent declaration from the U.S. Surgeon General of the ongoing Loneliness Epidemic supports our findings of Americans seeking community with others. Socialization aspects of group exercise might be advantageous to consider and capitalize on when designing public health programs aimed at improving health outcomes.

LEAN Healthcare: Evaluation of the Discharge Process at Mid-Sized Hospital

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Introduction/Objectives: A team of 8 osteopathic medical students were tasked with learning and implementing the LEAN process. LEAN is a philosophy of process improvement through creation of standard workflow and minimization of waste. Oklahoma State University Center for Health Systems Innovation in partnership with Oklahoma State University Medical Center tasked the team with identifying inefficiencies embedded within the Discharge Process specifically, patients being discharged from inpatient units. This research discusses the teams findings and recommendations provided to hospital leadership.

Methods: The Medical student team participated in lecture and simulation instruction led by two LEAN trainers to obtain knowledge of the use of LEAN in healthcare settings. The Students involved performed Gemba walk at a local hospital on Medical/Surgical floors specifically observing tasks related to discharging patients, interviewed key players that contribute to the discharge process, obtained perspectives on the current state, known inefficiencies, and recommendations for change. Documentation was obtained for current protocols / standard operating procedures. The team shadowed staff and collected data points for 40 patients including date of discharge, time discharge order was signed, time After Visit Summary was printed and signed, time patient exited unit, and time patient was marked 'Out of Room' on EPIC. Information was collected regarding events associated with discharging the patient through observation and communication with staff involved. A flow chart was then created to map out the current state for discharging a patient, identified areas of inefficiencies, notated with 'Storm Clouds' were shown on the flow chart. Students then analyzed inefficiencies and potential recommendations evaluating benefit vs. effort, controllable vs non-controllable, and cost vs no cost. At the end of the project, the team presented LEAN Discovery Recommendations to hospital leadership.

Results: The current state of the discharge process was divided into three stages. Stage one begins when the patient is admitted to the hospital and ends the morning of discharge. Stage two takes place from pre-rounds to when the discharge order is placed in Epic. Stage three begins after the discharge order is placed and ends when the Environmental Services Department is notified of patient's departure. During stage one, we observed inconsistent communication between care teams, a lack of standardization, and no defined role for collecting a discharge pharmacy. Stage two showed a lack of standardization amongst physician teams and inconsistent communication of potential patient discharge between hospital leadership and nursing staff. Inefficiencies observed in stage three consisted of discharge orders placed with pending tasks and difficulties securing patient transportation.

Conclusions: The team's investigation of this topic identified themes of inefficiencies: standardization, defined roles, and communication. With the implementation of LEAN training students produced potential recommendations of cost-effective interventions and "best practice" procedures for key players involved.

Keywords: LEAN Healthcare, discharge process, process improvement

Influence of Publications on the Management of Appendicitis

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Introduction: This article examines the influence of scientific knowledge dissemination on medical practices, specifically the shift in appendicitis management from surgical to non-operative approaches. By analyzing CPT codes and publication data from PubMed, we establish a positive relationship between surgery ratio and average citations per publication, indicating higher adoption of non-operative management with increased citations. This study contributes to understanding how knowledge dissemination impacts patient care and drives changes in medical practices. Understanding the influence of scientific knowledge dissemination on medical practices can pave the way for evidence-based advancements in healthcare, potentially leading to improved patient care and outcomes. Recently, there has been a significant shift in the management of appendicitis from surgical treatment to non-operative approaches using antibiotics. Our hypothesis posits that this shift is driven by scientific discoveries documented in published literature. This paper seeks to uncover the influence of scientific literature on clinical decisions and its impact on patient care, contributing to evidence-based healthcare advancements.

Methods: Patient data was extracted from Cerner Real-World Data, a comprehensive database of over 100 million patients. We analyzed trends in Current Procedural Terminology (CPT) code frequency from 2000-2022, focusing on patients aged 18-45 with an ICD9 or ICD10 code for appendicitis. We calculated the ratio of patients undergoing surgery within 7 days of diagnosis to those managed with antibiotics. Publication data related to appendicitis and antibiotics were obtained from PubMed. A custom Python script interfaced with PubMed's API was developed to retrieve the number of publications related to appendicitis and antibiotics from 2000-2022. Additionally, the script obtained citation counts for each publication to calculate the average citations per publication.

Results: From 2000-2022, there were 152,827 unique encounters for appendicitis in our Cerner Real-World Data analysis and 2,416 publications from our analysis of PubMed. A correlation analysis found a significant positive correlation (Pearson's r=0.387, p<0.001) between surgery ratio and average citations. This suggests that as average citations per published paper increased, the surgery ratio for appendicitis tended to decrease, indicating a higher adoption of non-operative management. An OLS regression analysis showed that the publication citation ratio explained around 15% (R =0.150) of the variation in the surgery ratio. Granger causality test was performed at different lag orders. At lag order 2, the test statistic (F test) was 3.04 with a significant p-value of <0.05.

Conclusions: Our study establishes a relationship between the paradigm shift in appendicitis management and scientific publications in the form of research papers. However, including more parameters in future investigations on scientific publications will provide a more comprehensive understanding into how these parameters influence medical practices and drive transformative changes in patient care.

Keywords: appendicitis, antibiotics, appendectomy, surgery, non-operative

Rates and Disparities in Emergency Department Treatment of Alcohol Use Disorder

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Background: Alcohol Use Disorder (AUD) remains the third leading cause of preventable death in the United States. Yet, AUD continues to be undertreated. Medication-assisted treatment (MAT) prescribed in the Emergency Department (ED) has demonstrated efficacy in treating other substance use disorders, prompting recommendations for treatment of AUD as well. Our objective is to identify the prevalence of MAT initiation for AUD during ED visits, as well as demographics and concurrent diagnoses that influence treatment initiation.

Methods: This study is a cross-sectional analysis utilizing the Cerner Real World Health database. Patients diagnosed with AUD presenting to the ED between August 2015 to August 2022 were identified using ICD-10 and ICD-9 codes (F10, 303.90). Individuals with a history of opioid use disorder were excluded. The analysis compared the treatment group (TG) of AUD patients who initiated naltrexone (NTX) treatment, with the non-treatment group (NTG) of AUD patients who did not initiate NTX treatment. Analysis encompassed gender, race, diagnoses, and prescribed medications. Our predetermined α level was .05. Statistical analyses were conducted using chi-square testing via IBM SPSS software.

Results: 479,548 patients diagnosed with AUD presented to the ED in the study period. The NTG consisted of 476,881 patients and the TG 2,667. There was association between race and initiation of NTX (x^2_4=123.5, p<.001). Whites were more represented in the TG compared to the NTG (68.6% vs 63.4%). Blacks (4.6% vs. 10.5%), Hispanics (0.7% vs. 1.7%), and Asians (0.5% vs. 0.9%) were less represented in TG compared to NTG. Native Americans had no difference between TG and NTG (5.1% vs. 4.8%, x^2_1=0.6, p=.435). There was an association between diagnoses and initiation of NTX (x^2_{11}=1261.2, p<.001). The TG demonstrated higher rates of alcohol dependence (44.3% vs 19.2%), suicidal ideation (40.1% vs 13.0%), withdrawal symptoms (27.8% vs 12.2%), major depressive disorder (26.5% vs 10.1%), anxiety (17.2% vs 9.5%), and blood alcohol level > 240 mg/100 mL (12.1% vs 10.2%) compared to NTG. Gender, nicotine dependence, abdominal pain, and nausea were similar between groups.

Conclusions: Initiation rates of MAT for AUD in the ED are influenced by specific diagnoses and reveal disparities across racial groups. Future interventions should tailor treatment protocols for AUD in the ED, considering these identified patterns.

Keywords: Alcohol use disorder, naltrexone, emergency department, medication-assisted treatment, alcohol use

Blue Light Therapy Improves Sleep Quality and or Sleep Disturbances in Those with Concussions: A Critically Appraised Topic

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Background: Utilizing data from the 2017 national Youth Risk Behavior Survey, the Center for Disease Control analyzed the prevalence of concussions in high school aged students and estimated that approximately 15% of students (2.5 million) reported having at least one concussion during the study period. Concussions are a form of traumatic brain injury (TBI) and can cause problems such as headaches, dizziness, dazed or confusion, difficulty remembering or concentrating, vomiting, blurred vision, but one of the most common complications that can occur from concussions are sleep disturbances/disorders. About 90% of those who have a TBI reported some type of sleep disturbance that include insomnia, frequent wakefulness after onset sleep, general sense of poor sleep quality, disordered breathing, fatigue, increased need for sleep, and or daytime sleepiness that may possibly interfere with daily living activities. Previous evidence suggests that daily blue wavelength light therapy (BLT) may be effective at reducing fatigue and improving sleep in patients recovering from mild TBI. Therefore, the clinical question of this critical appraisal is: does BLT help improve overall sleep quality and or sleep disturbances in those with concussions?

Methods: A computerized literature search was conducted from October to November of 2023 through PubMed, Medline, Google Scholar, and ScienceDirect to identify studies of level 2 evidence or higher investigating the impact of BLT on sleep in concussed patients. Those studies included must have assessed the effectiveness of BLT versus a control to improve sleep quality and or sleep disturbances . The main outcomes were fatigue, daytime sleepiness, sleep quality, and depression.

Results: The search strategy revealed 4 relevant studies that were included and met the inclusion and exclusion criteria. All of the studies supported the clinical question and identified that BLT intervention helps improve sleep quality and or disturbances in concussed patients. One study showed that the BLT group feel asleep 57.5 minutes earlier compared to baseline (P =.004). While another study shows that there was a significant reduction in fatigue in those that were in the BLT group (P < .001) with also a significant reduction of daytime sleepiness in the BLT group (P <.01).

Conclusions: There is significant evidence that shows that BLT improves sleep quality and or sleep disturbances in those who have sustained a concussion. Peak absorption for the light sensitive protein, melanopsin is around 480nm, most of these studies utilized the intervention for at least 30 minutes throughout a 6-week period. BLT was also shown to improve other concussion symptoms that were not investigated in this study such as depression, alertness, and cognitive function.

Keywords: blue light therapy, concussion, TBI, sleep quality, sleep disturbances

Clinical Perspective on Core Outcome Sets in Chronic Kidney Disease Trials: A Web-Based Survey Study

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Introduction: Clinical trials are crucial for medical advancements, with Core Outcome Sets (COS) proving to be an important tool for reducing variability and standardizing outcome measurements. Given the high prevalence and severe complications of Chronic Kidney Disease (CKD), utilizing COS in CKD research can lead to more effective preventative and therapeutic measures. This study aims to understand the adoption of COS within the CKD research community, identify potential barriers and improvements, and provide insights for future strategies to maximize the quality and comparability of CKD trial outcomes.

Methods: The participants comprised of clinical trial professionals who have been involved in CKD trials over the past five years. Investigators reached out to participants via email to distribute a comprehensive web-based survey. The survey, conducted via REDCap, will gather demographic information and assess participant familiarity with Core Outcome Sets (COS) in CKD trials. The selection of COS was informed by the Core Outcome Measures in Effectiveness Trials (COMET) Initiative database. The survey will be open for responses for a duration of eight weeks, with bi-weekly reminders sent via email to encourage participation. Participants will be required to provide informed consent before commencing the survey.

Results: Data is currently in the collection phase of this study. Analysis of survey responses will include: (i) descriptive statistics to summarize patient demographics and responses to close-ended questions, (ii) inferential statistics, such as chi-square tests and t-tests, to identify relationships between variables or differences among subgroups, and (iii) qualitative data, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusion: Upon completion of this project, our data will offer insights into how clinical trialists use and comprehend the COS. The knowledge obtained from this research may act as the groundwork for future initiatives and interventions aimed at enhancing the utilization of COS among clinical trialists. These outcomes may promote standardization in clinical COS reporting, ultimately improving patient outcomes with CKD.

Keywords: Chronic Kidney Disease, Clinical Trials, Core Outcome Sets

A Survey of the Perceptions, Knowledge, and Use of Core Outcome Sets in Knee and Hip Osteoarthritis Trials: A Cross-Sectional Study

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Background: Osteoarthritis (OA) of the knee and hip is a prevalent and financially burdening cause of disability globally. Thus, significant effort towards developing effective clinical practices to manage this disease is warranted. Clinical trials play an integral role in guiding clinical practices, and thus an increase in the number of trials performed. With this increasing number of trials, it is imperative to decrease outcome reporting heterogeneity. Core outcome sets (COS) are used to standardize clinical trial outcomes which serves to increase the comparability of clinical trial results and reduce reporting bias. By gathering our data from clinical researchers themselves, our goal is to gain an understanding into the decision-making behind outcomes used and assess the researchers' perspectives on the current OA COS.

Methods: In a previous investigation, we assessed the alignment of the COS for knee and hip OA. This 20-question survey targets clinical trialists who planned, executed, or analyzed OA trials in years prior. All participants will have informed consent and maintain complete anonymity. The participants' familiarity with COS will determine the survey path they follow. Surveys will be administered to trialists via REDCap (Research Electronic Data Capture), a secure web-based application designed for research data collection. Data analysis may include both descriptive and inferential statistics. Additionally, open-ended questions will be used to obtain qualitative data.

Results: Data is currently in the collection phase of this study. Analysis of survey responses will include the following: Descriptive statistics: summarizes patient demographics and responses to close-ended questions; Inferential statistics: examples include chi-square tests and t-tests which may be used to identify relationships between variables or differences among subgroups; Qualitative data: derived from responses to open-ended questions, which will undergo thematic analysis to discern recurring themes and patterns.

Conclusions: Upon completion, the collected OA data will give us insight into clinical trialists' use and knowledge of COS. This research could lay the groundwork to focus on improving the efforts, intervention, and adoption of COS among future clinical trials. Additionally, findings from this experiment may potentially foster consistency in reporting outcome sets, leading to enhanced OA patient outcomes.

Keywords: Core Outcome Sets, Osteoarthritis

Exploring Affordable Solutions for Orthopedic Medications: A Comparative Study of Mark Cuban Cost Plus Drug Company (MCCPDC) and Medicare

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Background: Healthcare spending on medications has continued to rise over the years, presenting a dilemma with affordable medications, notably in the field of orthopedics. To combat this issue, the Mark Cuban Cost Plus Drug Company (MCCPDC) platform has been established as an alternative to lower the financial burden placed on patients. The goal of this study is to assess the differences between MCCPDC and Medicare Part D orthopedic medication pricing.

Methods: We performed a cross-sectional analysis on the price difference on gout, muscle relaxants, pain and inflammation medications, as well as steroids between MCCPDC and Medicare Part D 2021 spending data. Prices, including shipping fees, were included for tablets and capsules in the minimum quantity (30ct) and maximum quantity (90ct). The unit costs, and total savings, and standardized unit prices for 30ct and 90ct prescriptions were calculated and compared between MCCPDC and Medicare medications.

Results: Our study sample comprised 24 medications for comparison after exclusions within four different MCCPDC categories. Medicare's expenditure for these medications totaled $1.3 billion. Cost savings with MCCPDC were shown in 10/24 of the 30ct medications, with a $800.10 cumulative cost reduction in favor of Medicare. In contrast, 90ct medications showed 15/24 medications with MCCPDC cost savings. The cumulative cost difference was $309.1 million in favor of MCCPDC.

Conclusion: Our findings illustrate large potential savings observed for many common orthopedic 30ct and 90ct medications, with a more substantial cumulative cost difference observed in 90ct medications. Hence, our study highlights the potential benefits of MCCPDC in optimizing Medicare expenditures for covered drugs, potentially enhancing cost-efficiency in healthcare. A careful analysis of specific prescribed medications are needed in order to capitalize on the potential savings.

Keywords: Orthopedic medications, Medicare pricing, Cross-sectional analysis

NOTES

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