

Frank Low Research Day



44th Annual

FRANK LOW RESEARCH DAY

April 11, 2024

UNIVERSITY OF NORTH DAKOTA
School of Medicine & Health Sciences



Frank N. Low

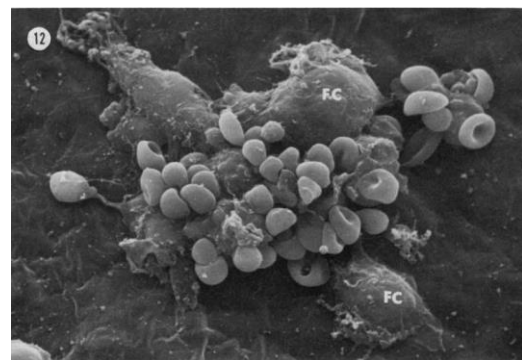
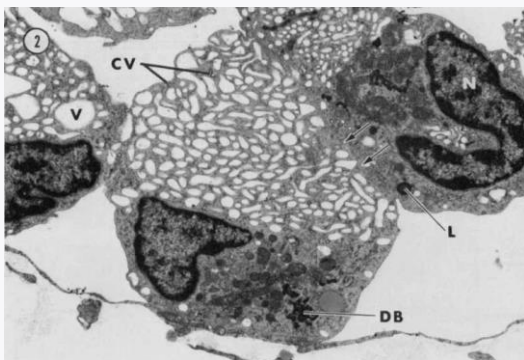


Frank N. Low was born in Brooklyn, New York in 1911 and received an undergraduate degree in 1932 and a PhD in Histology and Embryology in 1936 from Cornell University. Dr. Low held positions at Tufts College of Medicine, the University of West Virginia, and the Johns Hopkins University School of Medicine before beginning a 15-year tenure at Louisiana State University Medical Center in New Orleans. In 1964, Low was appointed Hill Research Professor of Anatomy at the University of North Dakota (UND) School of Medicine, a position he held until his retirement in 1981.

Dr. Low became internationally known for electron microscopy and the superb quality of his micrographs. He developed a state-of-the-art electron microscopy lab at UND. During this time, he trained 23 Masters and 19 PhD students, many of whom have developed distinguished careers in teaching and research. He worked tirelessly with his students in the laboratory and in the classroom. Dr. Low was awarded a Chester Fritz Distinguished Professorship from UND in 1975 and upon his retirement 1981 the school honored his accomplishments and service to UND by designating an annual Frank N. Low Research Day to bring together faculty, staff and student researchers in the biomedical, clinical, and translational sciences. Dr. Low died on April 28, 1998.

(Carlson, Edward C. 1999. [Frank N. Low: Gentle Giant of Electron Microscopy \(1911-1998\)](#). *The Anatomical Record (New ANAT.)* 257:48-49.)

Frank Low Research Day is the culminating event of the academic year for many area researchers working in the biomedical and health sciences. At this year's Frank Low Day event, over 200 faculty members, post-doctoral fellows, medical residents and students will participate in the celebration of the gathering and dissemination of knowledge.



Malloy, JJ & Low, FN. 1976. [Scanning electron microscopy of the subarachnoid space in the dog. IV. Subarachnoid macrophages.](#) *J Comp Neurol.* 167:257-283.

Schedule

FRANK LOW RESEARCH DAY

Thursday, April 11, 2024 | 8:00 AM – 5:00 PM

7:30 AM – Poster setup | Please leave posters up for all sessions

Links to recorded presentations and Zoom links are listed with abstracts

Poster | Video Sessions I and II (West Atrium, First Floor)

8:00 AM – 10:00 AM	Live Q&A Session I: Basic Sciences and Occupational Therapy Research
10:00 AM – 12:00 PM	Live Q&A Session II: Basic Sciences, Occupational Therapy, and Undergraduate Research

Lunch

12:00 PM – 1:00 PM	Lunch Served – East Atrium, First Floor
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Poster | Video Sessions III (West Atrium, First Floor)

1:00 PM – 3:00 PM	Live Q&A Session III: Medical Science Research, Population Health, Indigenous Health, and Rural Health
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Keynote Lecture – Susan Amara, PhD (UND SMHS E101 or [Zoom](#))

The intimate regulatory relationships between GPCR signaling and neurotransmitter transporters: an intracellular perspective

3:00 PM – 3:05 PM	Welcome Remarks – Joshua Wynne, MD, MBA, MPH, UND Vice President for Health Sciences Dean, School of Medicine & Health Sciences
3:05 PM – 3:10 PM	Introduction – Roxanne A. Vaughan, PhD
3:10 PM – 4:10 PM	Keynote Speaker – Susan Amara, PhD Scientific Director of the Intramural Research Program at the National Institute of Mental Health

Awards Announcement to follow if results are available (4:30 PM)

Keynote Speaker

Susan Amara, Ph.D.

Scientific Director, Intramural Research Program
National Institute of Mental Health

The Intimate Regulatory Relationships Between GPCR Signaling and Neurotransmitter Transporters: An Intracellular Perspective



BIOGRAPHY

Work in Dr. Amara's laboratory has focused on the structure, function, and cellular physiology of neurotransmitter transporters, including glutamate transporters as well as the biogenic amine transporters, major targets for psychostimulant drugs and antidepressants. She received a bachelor's degree from Stanford University and a doctorate in physiology and pharmacology from the University of California, San Diego. Her previous faculty appointments include Yale University School of Medicine and the Vollum Institute in Portland, Ore., as a Howard Hughes Medical Institute Investigator at Yale and in Oregon. Prior to moving to NIH, she served as the Thomas Detre Chair of Neurobiology and Distinguished Professor at the University of Pittsburgh School of Medicine. She is a member of the National Academy of Sciences, a fellow of the American Association for the Advancement of Science, and a past-president of the Society for Neuroscience.

Directory of Abstracts

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Poster Session 1 Abstracts

Traditional Posters

1. SARS-CoV-2 S1 induces endolysosome leakage and increases IL-6 release in astrocytes

Wendie Hasler, Neda Rezagholizadeh, Emily McKay, Gaurav Datta, Xuesong Chen

Biomedical Sciences Graduate Student

Neurological complications of COVID-19 persist for months following initial SARS-CoV-2 infection, but the underlying mechanism remains elusive. The enduring presence of certain viral elements in the brain may elicit an abnormal immune response, causing damage to CNS cells and subsequent neurological complications. One such viral factor is the SARS-CoV-2 spike protein S1 subunit, which persists in the bloodstream months after initial infection and crosses the blood-brain barrier. Because SARS-CoV-2 S1 predominantly localizes in astrocytes, we focus on its direct impact on primary human astrocytes. Our study revealed the internalization of S1 into astrocytes, as evidenced by the localization of iFlor-488-labeled S1 proteins within LysoTracker-identified endolysosomes. Remarkably, S1 induced endolysosome leakage, as indicated by galectin 3 puncta formation inside the cell with immunostaining method and increased extracellular release of galectin 3 with ELISA assays. S1 also induced inflammatory response, as indicated by increased levels of IL-6. Further mechanistic investigations using both pulldown assay and colocalization methods show that S1 interacts with TLR7, a pattern recognition receptor residing in endolysosomes. Significantly, siRNA knockdown of TLR7 attenuated with S1-induced endolysosome leakage and increased IL-6. Our findings suggest that SARS-CoV-2 S1 induces direct endolysosome damage and elicits immune response in astrocytes through its interaction with TLR7. Such findings provide novel insights into the persistent neurological complications of COVID-19.

3. Novel causative agent of Lyme disease in Upper Midwest, *Borrelia mayonii*, pathology in murine model of Lyme disease

Dawn Cleveland, Nivanthi Wijetunga, Timothy Casselli, Catherine A. Brissette

Biomedical Sciences Graduate Student

Ticks carry a plethora of pathogens that cause disease in humans, with perhaps the most prevalent being bacteria in the genus *Borrelia*, referred to as spirochetes due to their unique spiral morphology. *Borrelia burgdorferi*, the causative agent Lyme disease, leads to persistent inflammation affecting the joints (arthritis), heart (carditis), and nervous system (Lyme neuroborreliosis). These symptoms can be recapitulated in specific laboratory mouse strains, allowing researchers to better understand Lyme disease pathology.

Borrelia mayonii is a newly recognized causative agent of Lyme disease in the Upper Midwestern United States. Patient illness caused by *B. mayonii*, compared with classical Lyme disease, had several clinical features not typically associated with Lyme disease, particularly high levels of spirochetes in the blood (spirochetemia). The goal of this study is to use the Lyme disease mouse model to investigate pathology of *B. mayonii*, both classic symptoms (arthritis, carditis) and non-classic symptoms (high spirochetemia). An accurate grasp of host pathology allows clinicians to more accurately prevent, diagnose, and treat *B. mayonii* infection.

5. Ghrelin Increases Synaptic Strength at the Perforant Path-Granule Cell Synapses and Facilitates Spatial Learning and Memory

Chidiebele S. Oraegbuna, Phani K. Kola, and Saobo Lei

Biomedical Sciences Graduate Student

Poster Session 1 Abstracts

The gut hormone and neuropeptide, ghrelin, affects growth hormone release, energy homeostasis and acts as a neuromodulator. The ghrelin hormone secretagogue receptors (GHSRs) are expressed in different parts of the brain including the dentate gyrus (DG) of the hippocampus. The granule cells (GCs) in the DG receive glutamatergic innervation from the perforant-path (PP) pathway originating from the entorhinal cortex. We studied the effects of GHSR activation on glutamatergic transmission at the PP-GC synapses using whole cell patch clamp recording. Our results indicate that application of ghrelin to activate GHSRs induced robust increases in AMPA receptor-mediated excitatory postsynaptic currents (EPSCs) suggesting that activation of GHSRs augments glutamatergic transmission at the PP-GC synapses. Ghrelin decreased both the coefficient of variation of AMPA EPSCs and paired-pulse ratio, suggesting that activation of GHSRs increases presynaptic glutamate release. We further used the Y maze spontaneous alternation test to assess the effects of GHSRs on working memory. Our results indicate that application of ghrelin directly into the DG significantly increased the alternating sequences compared to the saline control group, suggesting that activation of GHSRs augments spatial memory. Ghrelin-mediated memory enhancement was blocked by adenylate cyclase and Epac2 inhibitors, suggesting that cAMP and Epac2 are involved in GHSR-mediated augmentation of spatial memory. Our findings provide a cellular and molecular model to explain the roles of GHSRs in cognitive functions.

7. Role of TLR7 in Tat-induced Cytokine Release in Astrocytes

Neda Rezagholizadeh, Wendie A. Hasler, Erica Nguon, Gaurav Datta, and Xuesong Chen

Biomedical Sciences Graduate Student

HIV-1 Tat continues to play an important role in the development of HIV-associated neurocognitive disorder (HAND), even with combined antiretroviral therapy (ART). The secretion of Tat from infected cells is not attenuated by ART, and Tat levels in the brain remain high. Besides its direct neurotoxic effect, Tat is present in astrocytes and has been shown to induce astrocyte-mediated immune responses. The present study focused on exploring the mechanisms by which Tat induces astrocyte-mediated immune responses. Consistent with the notion that Tat enters uninfected bystander cells via receptor-mediated endocytosis, we demonstrated that Tat entered endolysosomes in primary human astrocytes. We demonstrated that Tat, but not its mutant form lacking the arginine-rich domain, significantly elevated IL-6 and IL-8 secretion in astrocytes. This finding highlights the importance of the arginine-rich domain in Tat-induced astrocyte-mediated immune responses. Further mechanistic studies using pulldown assays and colocalization studies demonstrated that Tat, but not mutant Tat, interacted with endolysosome resident Toll-like receptor 7 (TLR7). Significantly, siRNA knockdown of TLR7 attenuated Tat-induced increases in IL-6 and IL-8 in primary human astrocytes. Our findings suggest that Tat's interaction with TLR7 is a key mechanism driving astrocyte-mediated immune responses. Such findings provide novel insights into the development of neuroinflammation in HAND.

9. Skeletal Muscle Characteristics of Long-lived Dwarf Mice

Matthew J. Johnston, Sharlene. Rakoczy, and Holly. Brown-Borg

Biomedical Sciences Graduate Student

Ames dwarf mice live 50% longer than control littermates due to a genetic defect in growth hormone (GH) signaling, displaying delayed ageing processes in multiple body systems. A relatively unexplored organ system of this model is skeletal muscle (SM), which dictates energy consumption and serves as a good determinant of overall health. Here we compare the function, morphology, and maintenance of Ames dwarf mice SM against chronologically age-matched wild-type controls. SM function was evaluated across a six-

Poster Session 1 Abstracts

month period by having mice perform grip strength, rotarod, and endurance running experiments. Cohorts were divided into young, middle, and aged groups with regular plasma collections for future cytokine analysis. Dwarf mice show improved scores in relative grip strength, walking gait, and endurance running times compared to age-matched wild type mice. Proposed mechanisms behind increased function include improved oxidative and regenerative capacity in dwarf mice, paired with a higher percentage of type I fibers owing to muscular endurance. Histological analysis of muscle fiber quality and size was conducted via H&E and laminin staining of sectioned tibialis anterior muscle taken from both groups. Subsequent analysis using ImageJ software was conducted to quantify cross-sectional area (CSA) of individual muscle fibers. Dwarf mice show healthy nucleation yet a considerable reduction (50%) in myofiber CSA compared to wildtype SM - unsurprising due to their dwarfism. Future analysis of nucleation, stem cell population, and fibrotic environment of muscle taken from aged individuals should especially elucidate any meaningful differences. Upon completion of fitness testing, transcriptomic analysis of harvested muscle should elucidate differentially expressed genes between genotypes and the cellular pathways they influence. Utilizing a longevity model to study SM function and maintenance is a novel approach to gain insight into the seemingly inverse relationship between GH signaling and mammalian longevity.

11. Yersinia pestis drives macrophage differentiation toward the anti-inflammatory M2 phenotype in an in vitro infection model

Bernard Frempong, Abiola Sholarin, Bernadette Meberg, Suba Nookala, David S. Bradley, and Matthew L. Nilles

Biomedical Sciences Graduate Student

Macrophages are selectively targeted early in infection by *Yersinia pestis* (*Y. pestis*), the bacterium responsible for the plague, to create an intracellular niche that facilitates *Y. pestis*' survival and proliferation. Here, we identify the macrophage phenotype that *Y. pestis* induces at the initial stages of infection. Using an in vitro infection model, we investigated how *Y. pestis* affects macrophage polarization and cytokine production. *Y. pestis* infection skewed macrophage differentiation toward the anti-inflammatory M2 macrophage phenotype, characterized by the production of anti-inflammatory cytokines. e.g. IL-4, IL-10, and IL-13. Additionally, it was observed that *Y. pestis* suppresses the differentiation of macrophages to the inflammatory M1 phenotype by releasing pro-inflammatory cytokines like IL-6, IL-8, TNF- α , and IFN- γ . These insights contribute to a deeper understanding of the many strategies *Y. pestis* utilizes to circumvent host immune responses and establish infection.

13. Allergy-induced central leukocyte trafficking is likely triggered by allergen exposure through compromised intestinal barriers

Dilini Ekanayake, Rylan Setness, Kumi Nagamoto-Combs

Biomedical Sciences Graduate Student Food allergen consumption by sensitized by tolerant individuals are often implicated in behavioral problems. We previously showed that mice with subclinical cow's milk allergy (CMA) exhibited depression-like behavior after repeated allergen exposure. CMA mice also showed neuroinflammation and cortical demyelination associated with dural leukocyte infiltration. Hypothesizing that repeated consumption of food allergens by subclinically sensitized individuals would

cause intestinal damage and activate leukocyte the trafficking to the dura to adversely affect the brain, we assessed intestinal pathologies in CMA mice. Significant decreases in the exploratory activity and short-term memory of CMA mice were accompanied by cortical demyelination, microgliosis, and axonal

damage in the brains. Importantly, apparent decreases in tight-junction proteins were observed in the small intestines of CMA mice, suggesting increased gut leakiness. Our results indicated that repeated allergen consumption could trigger immune responses even in tolerant individuals, via increased gut permeability that would allow the transepithelial entries of allergens and other luminal pathogens.

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15. Endolysosome iron chelation rescues amyloid beta-induced mitochondrial damage and ferroptosis via regulation of SLC7A11-dependent mechanisms

Darius N.K. Quansah, Peter W. Halcrow, Nirmal Kumar, Jonathan D. Geiger

Biomedical Sciences Graduate Student

Accumulation of amyloid-beta (A β) proteins in the brain of people living with Alzheimer's disease (AD) is a major pathological hallmark of this disease; which is characterized also by increased iron levels, iron dyshomeostasis and neurotoxicity. Mitochondria are susceptible to oxidative damage through increased ferrous (Fe²⁺) iron levels that generate reactive oxygen species (ROS) via Fenton-like chemistry; effects that lead to redox catastrophe and bioenergetic crisis. Previously, we showed that insult-induced endolysosome de-acidification resulted in decreased endolysosome Fe²⁺ levels, increased cytosolic and mitochondrial Fe²⁺ and ROS levels as well as cell death; effects all blocked by the endocytosed iron-chelator deferoxamine (DFO). Thus, it was important to determine the mechanism(s) by which A β proteins cause ferroptosis. Using flow cytometry and confocal microscopy on SH-SY5Y human neuroblastoma cells, we examined the effects of A β proteins (A β 1-40, A β 1-42, A β 42-1) 6 to 10 hours post-treatment. We observed that A β 1-42 but not A β 1-40 (1) trafficked into endolysosomes, (2) decreased endolysosome Fe²⁺ levels, (3) increased mitochondrial Fe²⁺ and ROS levels, (4) increased lipid peroxidation, and (5) decreased SLC7A11 antiporter protein levels. Because SLC7A11 mediates the uptake of extracellular cystine, which is a rate-limiting precursor in glutathione synthesis, the decrease in SLC7A11 levels suggested depletion in levels of glutathione; the substrate for the anti-ferroptotic glutathione peroxidase-4 (GPX-4). These changes led to an increase in cell death (ferroptosis) and the effects were blocked by DFO. Taken together, the findings show that endolysosome Fe²⁺ stores may be linked to A β -induced ferroptosis and AD pathogenesis, and further understanding can lead to new therapeutic strategies against AD that target endolysosome stores of iron.

17. Nucleosome Interactions of Pioneer Factors: A Critical Determinant of Chromatin Plasticity

Aerica Nagornyuk, Sarah DiDonna, Dhaval Ghone, Mika Saotome, Aussie Suzuki, Ph.D., Motoki Takaku, Ph.D.

Biomedical Sciences Graduate Student

Cellular reprogramming is a critical process in regenerative medicine and disease modeling, where differentiated cells are converted into undifferentiated or different cell types. This reprogramming is achieved through the orchestrated expression of transcription factors and chemical treatments, which alter the cell's chromatin landscape and establish a new transcriptome.

Pioneer factors, a type of transcription factor, initiate cell development and cell fate transition by binding to specific DNA motifs within nucleosomes. This binding leads to the recruitment of co-factors and chromatin opening. Improper engagement of these factors can contribute to various human diseases, including cancer.

Recent cryo-electron microscopy (cryo-EM) studies of the transcription factor-nucleosome complex have indicated variations in motif recognition and binding forms when pioneer factors bind to nucleosomes.

However, whether this unique binding form is required for their 'pioneering' activities remains largely unclear. GATA3, a pioneer factor prominently involved in mammary gland development, has emerged as a key regulator in breast cancer pathogenesis. Our cryo-EM structure of the GATA3-nucleosome complex also suggests a unique binding form of GATA3 on nucleosomes, in which GATA3 stably interacts with nucleosomes through dual motif recognition on the surface of nucleosomes. To experimentally test if dual motif recognition is required for successful MET, our lab engineered a series of GATA3 mutant cell lines.

Functional characterization of these mutants in MDA-MB-231 breast cancer cells demonstrated that two zinc finger domains are required for GATA3's binding to closed chromatin. When one of the zinc finger domains is mutated, GATA3 can still bind to open chromatin but cannot bind to closed chromatin.

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Interestingly, hot spot missense mutations found in breast tumors are located near the zinc finger domains. When these mutants are expressed in MDA-MB-231 cells, they exhibit increased chromatin binding activities, leading to chromatin closing. Cells expressing these mutants displayed altered MET phenotypes at both molecular and cellular levels. Together, our finding underscores the importance of precise regulation of pioneer factor-nucleosome interactions in cellular reprogramming processes.

Our data also suggest that misregulation of pioneer factor chromatin binding due to missense mutations may contribute to tumorigenesis or tumor progression.

19. SEI enhances the therapeutic outcome of HPV E7 peptide for established carcinoma in HLA-DQ8 transgenic mice

Abiola Sholarin, Bernard Frimpong, Nathan Velaris, Bernadette Meberg, Suba Nookala, Matthew L. Nilles, David S. Bradley

Biomedical Sciences Graduate Student

Cervical cancer is caused by persistent infection with human papillomavirus (HPV). Recurrent HPV infection results in the synthesis of the HPV E7 protein in cervical epithelial cells, and E7 is a putative therapeutic target for cervical cancer, with modest success. We have previously demonstrated the immunotherapeutic efficacy of Staphylococcal superantigens, SEG, and SEI for established murine melanoma in humanized HLA-DQ8 tg mice. Here, we investigated the immunotherapeutic potential of SEG or SEI with or without exogenous E7 peptide in HLA-DQ8 tg mice with established TC-1 cancer cells expressing both HPV E6 and E7 peptides. We demonstrated that post-tumor engraftment, SEI + E7

treatment completely ameliorated cancer, with a 100% survival rate observed 100+ days after tumor engraftment, significantly better than untreated controls, and markedly improved over other SEG, SEI, or E7 treatment regimens. This suggests the potential of SEI as an immunotherapeutic for established cervical carcinoma.

23. TRPML1-redox sensing regulates gp120-mediated changes to levels of cellular iron and reactive species

Nirmal Kumar, Braelyn Liang, Darius N.K Quansah, Pater W. Halcrow and Jonathan D. Geiger

Biomedical Sciences Graduate Student

Increased levels of reactive species and endolysosome dysfunction are implicated in the pathogenesis of neurodegenerative disorders, including HIV-1 associated neurocognitive disorders (HAND). Others and we have shown that HIV-1 envelope glycoprotein gp120 induces changes in endolysosome function, iron homeostasis and the reactive species interactome (RSI), which can result in neuronal injury and death.

However, the mechanisms by which HIV-1 gp120 impairs endolysosomal function and triggers disruption in intracellular iron and RSI homeostasis remains unclear. Endolysosome-resident cation channels including transient receptor potential mucolipin-1 (TRPML1), that functions as a redox sensor, have been implicated in the neurotoxic actions of HIV-1 gp120. Here, using SH-SY5Y human neuroblastoma cells we found that HIV-1 gp120 increased levels of endolysosome reactive oxygen species (ROS), lipid peroxidation (LPO) and protein oxidation, and decreased levels of hydrogen sulfide (H₂S), glutathione (GSH) and endolysosome ferrous iron (Fe²⁺); all these effects were blocked by Ned-19, an analog of nicotinic acid adenine dinucleotide phosphate that inhibits TRPML1. Additionally, increased levels of intracellular reactive species led to TRPML1 activation and oxidation-induced endolysosome Fe²⁺ release into the cytosol; effects blocked by the antioxidants N-acetyl cysteine and Trolox as well as Ned-19 or decreased protein expression levels of TRPML1 channels. HIV-1 gp120-induced increases in cytosolic Fe²⁺ and ROS levels and decreases in cytosolic H₂S levels were blocked by Ned-19. Thus, TRPML1-mediated redox sensing controls intracellular levels of iron and reactive species and inhibition of aberrant TRPML1 activity may represent a promising strategy against HAND and other diseases where iron and redox imbalances have been implicated.

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25. Cell-free DNA predicts drug sensitivity in Breast Cancer Treatments

Sakuntha D. Gunarathna, Mamoru Takada, Regina Nguyen, and Motoki Takaku

Biomedical Sciences Graduate Student

Cell-free DNA (cfDNA) is increasingly recognized for its promising role as a non-invasive biomarker, offering insights into the genetic and epigenetic profiles of its originating cells. In cancer patients, certain populations of cfDNA are released from cancer cells, making it an attractive tool for predicting cancer patient outcomes. In our previous studies, we have demonstrated that cfDNAs are enriched in open chromatin regions and are associated with unique enrichment patterns between healthy donors and cancer patients. In cancer patients undergoing treatment, we noted significant alterations in these enrichment patterns, revealing shifts in cfDNA profiles post-therapy. This suggests that cfDNA could serve as a tool for monitoring the effectiveness of cancer therapies, enabling a non-invasive approach to assess tumor dynamics and response to treatment in real-time. To address this hypothesis, we purified cfDNA from high-quality blood plasma samples obtained from Chiba University, Japan. We collected pre- and post-treatment samples from metastatic recurrent breast cancer patients who underwent cancer drug treatment. The purified cfDNAs from cancer patients contained longer DNA fragments compared to healthy donors. Next-generation sequencing analysis of these cfDNAs revealed differentially enriched genomic regions between pre- and post-treated samples. These identified genomic regions are often correlated with genes active in critical biological pathways, including apoptosis, cell cycle regulation, and cellular senescence. Further clustering analysis focused on pre-treatment samples revealed the differentially enriched genomic loci associated with drug treatment sensitivity. Building on this strategy will enhance future research to pinpoint patient-specific drug sensitivities, guiding patients toward the most effective treatments, and minimizing exposure to ineffective therapies.

27. Cisplatin-Induced Nephrotoxicity in Renal Progenitor and Differentiated Cells

Eloho Ighofose, Aaron Mehus, Scott Garrett, Donald Sens, Sarmad Al-Marsoum, Seema Somji.

Clinical & Translational Science Graduate Student

The proximal tubule segment of the kidney is sensitive to damage by drugs and toxicants, including cisplatin, used in cancer treatment. We compared the response of renal progenitor/stem cells (HRTPT)

and differentiated proximal tubular cells (HREC24T) to cisplatin-induced toxicity. HRTPT cells showed resistance and reversible morphological changes, while HREC24T cells displayed persistent damage-related changes and heightened gene expression of renal damage markers.

Introduction: The kidney's proximal tubule is vulnerable to nephrotoxic agents like cisplatin. Understanding cellular responses to cisplatin toxicity is crucial for managing kidney injury in cancer treatment. We investigated how renal progenitor/stem cells and differentiated cells respond to cisplatin.

Background: Cisplatin, an effective anticancer drug, can cause kidney injury. Renal progenitor cells are proposed for renal regeneration post-injury due to their stem-like properties. However, their response to cisplatin toxicity compared to differentiated cells is unclear.

Purpose of the Study: We aimed to understand how renal progenitor/stem cells (HRTPT) and differentiated proximal tubular cells (HREC24T) respond to cisplatin toxicity. We analyzed morphological changes, gene expression, and platinum accumulation to uncover cellular resistance or susceptibility to cisplatin.

Methods: HRTPT and HREC24T cells were exposed to 1.5 μ M cisplatin for eight passages. Morphological changes were monitored using light microscopy. Platinum accumulation was measured via ICP-MS after short-term (20 μ M) cisplatin exposure. Gene expression of renal damage markers was assessed using qPCR.

Poster Session 1 Abstracts

Results: HRTPT cells showed reversible morphological changes and lower gene expression of damage markers compared to HREC24T cells. Both cell types accumulated platinum, indicating drug uptake and potential damage initiation.

Discussion: The study highlights HRTPT cells' resistance and potential role in renal regeneration post-cisplatin exposure. Understanding these cellular responses can guide strategies to mitigate cisplatin-induced kidney damage in cancer patients.

Conclusion: Renal progenitor/stem cells exhibit resistance to cisplatin toxicity compared to differentiated cells. Harnessing the regenerative potential of these cells may offer novel approaches to protect against cisplatin-induced nephrotoxicity in cancer therapy.

29. Differential expression of super-enhancer long non-coding RNAs and associated mRNAs in AppNL-G-F vs Wild Type mice

Henry Elsenpeter, Colin Combs, and Archana Dhasarathy

Medical Student

Alzheimer's disease (AD) is an illness that progressively impairs both memory and cognition. These impairments gradually diminish one's ability to accomplish daily activities and live independently. AD is characterized by amyloid-beta ($A\beta$) plaques derived from proteolytic cleavage of the amyloid precursor protein, and neurofibrillary tangles made up of hyperphosphorylated tau proteins. Recent studies have implicated non-coding RNAs, such as microRNAs and long non-coding RNAs (lncRNAs), in the

pathophysiology of AD. While they do not themselves code for proteins, lncRNAs are >200 nt long RNAs that can regulate both gene and protein expression through multiple pathways. A special class of lncRNAs is associated with "super-enhancers", large genomic clusters of enhancer elements that are enriched with transcription factors and co-activators. These super-enhancer lncRNAs (SE-lncRNAs) can drive transcription of associated genes.

To explore the differential expression of super-enhancer long non-coding RNAs (lncRNAs) and associated mRNAs, we used microarrays to determine differential lncRNA expression in the parietal lobes of 4-6

month-old male and female littermate control C57BL/6 Wild Type (WT) and AppNL-G-F mutant knock-in mice. Importantly, APP is not overexpressed in this model but these mice accumulate $A\beta$ and recapitulate several AD-associated pathologies due to the familial mutations (Swedish "NL", the Iberian "F", and the Arctic "G" mutations).

We optimized a protocol for RNA isolation from these samples and determined that a combination of TRIzol reagent and column purification via PureLink™ RNA Mini Kit produced the highest sample amount and purity. The RNA samples from the WT and AppNL-G-F mice were sent to Arraystar Inc. for microarray hybridization and data analyses. We identified a total of 112 lncRNAs and 171 mRNAs that were differentially expressed between the WT and AppNL-G-F mice brains. Additionally, sex-specific differences were noted: 851 lncRNAs and 559 mRNAs were differentially regulated between females; while 198 lncRNAs and 203 mRNAs were differentially regulated between males. Gene ontology (GO) and pathway analysis of the AD-related lncRNAs and mRNAs indicated that immune cell signaling, cancer-specific, and cell signaling pathways were the most enriched. We have successfully validated a few of the most significantly enriched lncRNAs. Future experiments will explore the function of these lncRNAs and downstream regulatory pathways in AD.

31. Functional Characterization of the Taurine Transporter Variant Ala294Thr and Its Link to Human Disease

Poster Session 1 Abstracts

Michael Allen, Madhur Shetty, Rosa Grijalva, Sabrina Signorini, Enza Maria Valente, Mukthar Ullah, Carlo Rivolta and L. Keith Henry

Biomedical Sciences Graduate Student

The taurine transporter (TauT) is important for the proper homeostasis of taurine, a widely distributed amino acid critical to human health. Previously, we identified a TauT variant (Gly399Val) with diminished taurine transport that resulted in heart and retinal pathologies which were reversed or stabilized, respectively, using dietary taurine supplementation. Our current study focuses on a TauT mutant (Ala294Thr) identified in an Italian patient with similar pathologies. Functional and biochemical characterization of the variant is being performed using in vitro and ex vivo radioactive substrate uptake and cell surface expression biotinylation assays. Predictive structural and functional impact of the mutation was assessed using AlphaFold. In vitro uptake revealed a complete loss of function with possible dominant negative effects compared to wildtype TauT (n=5-6, $p < 0.0001$, t-tests), and initial ex vivo results show a similar pattern (n=1). Surface levels of Ala294Thr compared to wildtype TauT appear greatly diminished in initial surface expression results (n=1). The location of Ala294Thr in the predicted structure of TauT indicates the mutant drives protein misfolding due to aberrant amino acid side chain packing which likely targets the variant for degradation resulting in loss of cell surface expression and function. These findings in addition to ongoing taurine supplementation studies with the patient harboring this non-functional TauT mutant will indicate whether successful taurine treatment is occurring through TauT or another transporter. These outcomes will provide critical insight regarding how increased taurine intake elevates bioavailability in individuals harboring hypomorphic TauT variants.

33. The Comfort of Being at Home: The Benefits of Outpatient Rehabilitation in the Homes of Rural Residents

Madison J. Christian

Occupational Therapy Graduate Student

Background: Rural residents often face many barriers to accessing healthcare services, especially ongoing rehabilitative services (Asante et al., 2023; Coombs et al., 2022; Dymmott et al., 2022; UND

School of Medicine and Health Sciences, 2021; UND School of Medicine and Health Sciences, 2023). With health insurance companies dictating coverage for occupational therapy, physical therapy, and speech-language pathology, challenges have presented for those with ongoing rehabilitative needs who have difficulty leaving their homes and attending therapy in the clinic.

Purpose: The purpose of the scholarly project is to increase referral sources' knowledge of outpatient rehabilitation services in the home by the creation of an educational in-service. Developing evidence-based education will support therapists in educating referral sources to propel outpatient rehabilitation services in rural residents' homes.

Methods: A literature review was completed through the electronic databases of PubMed and CINAHL. To guide the creation of the product, the Ecology of Human Performance (EHP) model (Dunn, 2017) and andragogical teaching and learning methods were utilized (Bastable et al., 2020).

Conclusion: A variety of needs for healthcare access exist among rural populations, including the need for additional service delivery methods to provide rehabilitation to patients with ongoing therapy needs who may have difficulty leaving their homes. The product was created to increase referral sources' knowledge of outpatient rehabilitation services and to support professionals in advocating for referrals for therapy services.

35. Assistive Technology Accessibility and Usability: A Toolkit for Occupational Therapy Practitioners

Erin Siebenaler and Dr. Jane Loscheider, with Contributor: Matthew White

Poster Session 1 Abstracts

Occupational Therapy Graduate Student

Background: Assistive technology (AT) plays a vital role in the health, well-being, independence, and quality of life of individuals with a broad range of occupational challenges (American Occupational Therapy Association, 2016; Grajo & Boisselle, 2018; World Health Organization, 2023). Occupational therapists (OTs) and other AT providers can influence the accessibility and usability of AT; however, providers face

barriers with limited access to training and evidence-based practice, impacting their confidence in providing AT services (Demain et al., 2013; Dishman et al., 2021; Long et al., 2007; Manship et al., 2023). These barriers can cause feelings of incompetence and reluctance to recommend

AT, ultimately causing an underutilization of AT (Long et al., 2007; Manship et al., 2023; Van Niekerk et al., 2018). The purpose of this scholarly project is to create an evidence-based and user-friendly toolkit for organizing and sharing AT resources among OTs and AT professionals to increase competence in providing AT services across practice settings.

Methods: A needs assessment, including an extensive literature review and interviews with the partnering facility, was conducted to understand the supports and barriers of accessing and using AT. The project was guided by the Ecology of Human Performance model to holistically understand the person, context, and task factors involved in the provision of AT services (Dunn, 2017).

Product: An AT toolkit was designed using a web-based document-sharing platform called Microsoft SharePoint. The product will be used by the assistive technology team at the partnering facility to consolidate AT resources and keep track of technological advancements. Therapists within the partnering organization will have access to the AT resources within the toolkit to guide their recommendations and training for clients and caregivers.

Conclusion and Implications: The use of an electronic AT platform for education and training resources enables OTs to quickly and confidently access evidence-based AT information to help meet the unique needs of the individuals they serve. With increased confidence, therapists can make more frequent and effective AT recommendations promoting improved occupational performance among AT users.

37. Supporting Clients and Caregivers of Full-Time Wheelchair Users at Risk for Pressure Injuries

Jessica Wetzel, Jane Loscheider, and Paige McCullough

Occupational Therapy Graduate Student

Purpose: Wheelchair users are classified as a population at a great risk for developing pressure injuries due to their decreased sensation and extensive time seated on bony prominences (Mervis & Phillips, 2023). Affecting around three million adults each year in the United States alone, the number of pressure injuries is a cause for concern (Mervis & Phillips, 2023). More severe pressure injuries can cause sedentary lifestyles, further leading to occupational deprivation of the individual experiencing them. Although there are many strategies to prevent pressure injury formation, there is often a lack of knowledge regarding these strategies among wheelchair users, their caregivers, and healthcare staff (Dalvand et al., 2018; Lindhardt et al., 2020).

Method: To gather data related to the purpose of this scholarly project, an in-depth literature review was performed. Questions to guide the review were derived from constructs of the Ecology of Human Performance (EHP) Model, including the person, context, tasks, and performance range associated with the population of wheelchair users and their caregivers (Dunn, 2017). Additional evidenced-based sources were sought out and utilized as needed throughout the creation of this scholarly project.

Results: This scholarly project aims to improve the knowledge and awareness of pressure injury preventative strategies among a rural healthcare facility. Educational materials were created to fulfill this purpose, and are to be dispersed among the appropriate settings in the intended facility.

Conclusions: The educational materials were created for long-term care residents and staff, the therapy department, and patients discharging from the hospital. These materials differ based on the intended

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audience and will be dispersed and utilized throughout the facility to ensure preventative strategies are being applied.

39. Engage as You Age: An Interprofessional Toolkit to Increase Meaningful Activity in Long-Term-Care Facilities

Annah M. Greenmyer

Occupational Therapy Graduate Student

Background: When making the major life transition of moving into a long-term-care facility, older adults have an increased chance of experiencing negative mental health symptoms. During this life transition, older adults may experience loss of self-efficacy, because of the shift from their preferred roles and activities. When older adults do not engage in their preferred activities and/or roles, they may experience loss of motivation or energy which can eventually lead to feelings of depression and anxiety. For residents in rural long-term-care facilities, there are limited mental health resources because of accessibility (available services, transportation, etc.) and acceptability (biases, stigma, etc.). Therefore, to address mental health in rural facilities with limited resources, meaningful activity can be used to address mental health symptoms.

Purpose: The purpose of this scholarly project was to create a toolkit for the interprofessional team that helps increase the amount of meaningful activity for residents. The tools within the product were designed to benefit both residents and staff through increasing meaningful engagement amongst both groups. The overall goal is to improve the residents' sense of self efficacy to improve their mental health.

Methodology: The scholarly project was created through completing a literature review, needs assessment, skilled observation in a long-term-care facility, and communication with long-term-care staff and residents. The Ecology of Human Performance (EHP), Montessori, andragogy, and geragogy were used throughout the project's development.

Conclusion: This scholarly project was created to address the need for mental health services long-term-care facilities. The toolkit is meant to increase the amount of meaningful engagement between residents and staff. The end goal of the toolkit is that both residents and staff will experience an increase of meaning in their daily life/work.

41. AN OCCUPATION-BASED INTERVENTION GUIDE FOR CEREBRAL VASCULAR ACCIDENT IN THE OUTPATINENT SETTING

Julia Warmack, OTDS; Sclinda Janssen, PhD, OTR/L & Mandy Meyers, PhD

Occupational Therapy Graduate Student

Purpose: In the United States, strokes are the leading cause of death as well as a leading cause of long-term disability (Centers for Disease Control and Prevention [CDC], 2022). With strokes being such a prevalent disease in the United States, occupational therapists must be equipped with the best evidence available to help support those in need. Although evidence suggests that occupation is fundamental to the profession and produces more significant outcomes, practitioners still fail to demonstrate an occupation-centered practice (Fisher, 2014). Additionally, rural communities may not have the resources, access, or training to provide best practices (Centers for Disease Control and Prevention [CDC], 2017).

Methodology: A model-guided literature review will be completed in relation to the topic of evidence-based practice in the outpatient phase of stroke rehabilitation. The literature review will identify the current best practice interventions and frames of reference for stroke rehabilitation. Following the literature review, a resource guide will be created based on gaps identified in occupation-based stroke rehabilitation. This guide can be utilized by both practitioners and their clients.

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Anticipated Results: With the creation of this resource guide, it is anticipated that practitioners will be able to apply evidence-based practice throughout the outpatient phase of recovery. This guide will also benefit clients in rural areas with less access to healthcare, as it provides accessibility to effective and evidence-based tools that support their recovery.

Conclusion: Occupation-based interventions have been found to provide better long-term outcomes and more engagement from clients during rehabilitation (Juckett et al., 2020). The utilization of occupations is specifically critical during the outpatient phase of recovery as the brain experiences increased neuroplasticity 2-3 months following a stroke (Dromerick et al. 2021). This scholarly project and product provides evidence-based guidance to practitioners and clients on implementing occupation- or task-based stroke rehabilitation interventions.

43. Addressing Health Care Needs of Farmers in Rural Areas Through the Lens of Occupational Therapy

Josie Huot, OTDS; Mandy Meyer, PhD

Occupational Therapy Graduate Student

Purpose: The purpose of this scholarly project is to address the healthcare needs experienced by the farming population. The educational booklet entitled Spine Care for Farmers: Occupational Health in the Farming Community offers education and simple recommendations for the farming population to reduce the risk of injury associated with the spine while performing common agricultural activities.

Methodology: The Ecology of Human Performance (EHP) model was utilized to guide the scholarly project during all phases of development (Dunn, 2017; Dunn et al., 1994). An extensive literature search was completed through various databases including PubMed, Google Scholar, CINAHL Complete, the Centers for Disease Control and Prevention (CDC), the American Journal of Industrial Medicine, and the American Journal of Occupational Therapy (AJOT). Evidence from the literature search was summarized in a comprehensive literature review. A staff survey, observation, and informal discussions were utilized to conduct a needs assessment at the experiential site to obtain further evidence to guide the project.

Results: The projected outcome is to educate the farming population on musculoskeletal health and support safe occupational engagement. The results of the scholarly project are showcased through the development of the Spine Care for Farmers: Occupational Health in the Farming Community booklet, in which its contents were disseminated at the experiential site to a public audience. Additionally, the booklet will continue to be distributed by various departments at the experiential site and the effectiveness will continue to be monitored.

Conclusion: The Spine Care for Farmers: Occupational Health in the Farming Community booklet was created to fill a gap within the farming population to reduce occurrences of musculoskeletal injuries and pain from the intense demands of agricultural activities. If effective, this product has the potential to help farmers endure a long and healthy farming career.

45. Navigating the Wheelchair Recommendation Process: A Preventative Approach for Rural Providers

Kelsey M. Rajewsky and Jane Loscheider

Occupational Therapy Graduate Student

Background: Wheelchair procurement is a complex process that begins with patients seeing their physician for a prescription and guidance on where to go for step two. It is this critical second step that can make the difference for someone receiving a basic wheelchair meant for short-term use, or a referral to a practitioner specializing in seating and wheeled mobility. While getting to a physician's office can be challenging for all wheelchair users, a rural wheelchair user experiences additional barriers such as limited

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resources available locally, culture, and difficulties with traveling long distances to available services (Akinlotan et al., 2021; Frakt, 2019; Rural Health Information [RHI] Hub, 2018; Waite, 2015). When there is a disconnect at step two of the process, the wheelchair-seeking client could have an improperly fit wheelchair, which can lead to negative health outcomes such as pressure sores, contractures, pain, and negative psychosocial implications (Gowran et al., 2022; Sprigle, 2014; Valent et al., 2019). The purpose of this scholarly project is to create a tool to help educate and guide referring practitioners on the wheelchair procurement process.

Methodology: A thorough literature review guided by the Ecology of Human Performance (EHP) was completed to understand the barriers and supports for the wheelchair prescription and procurement

process. A partnering site, located within a rural area, provided guidance and support to further understand the unique experiences of the rural occupational therapy practitioner and develop a tool to assist referring providers in the wheelchair prescription process.

Product/Result: A flowsheet was designed to guide rural providers on the critical step of the wheelchair procurement process; when to refer for additional seating services or when a general wheelchair is adequate. The electronic medical record team was consulted for strategies to ensure a seamless transition with the best outcomes for the patient.

Conclusions: By providing physicians with the education and resources in the complex wheelchair procurement process, rural clients can secure a wheelchair for optimal occupational engagement and improved quality of life.

47. Peer to Peer: Implementing an Inclusive Program at a Midwestern School

Kaitlyn Ekre and Roberta Carrlson

Occupational Therapy Graduate Student

Transitioning to and between school settings (i.e., home to elementary, elementary to middle school, middle school to high school) can be a challenging experience for everyone. In middle school, there is an increase in academic, behavioral, and social demands (Chen et al., 2020; Fontil et al., 2020). While most students are able to navigate the different demands of middle school, students with disabilities struggle with building relationships and interacting with their peers along with academics leading to low involvement in extracurricular activities, inconsistent access to the general education classroom, and an absence of peer interactions throughout the day (Biggs & Robison, 2022; Carter, 2018; Espelage et al., 2016; Matthews et al., 2022). When schools engage in inclusive education through the use of peer-mediated interventions, opportunities for social interaction between peers increase (Biggs & Robison, 2022; Carter, 2018; Matthews et al., 2022). The purpose of this scholarly project is to assist schools in developing and implementing a peer to peer program to increase interactions between students with and without disabilities.

A needs assessment was completed through a comprehensive literature review guided by the Ecological Model of Human Performance (EHP) to find common themes relating to social participation between peers with and without disabilities (Dunn et al., 1994). The program developed is based off of Grand Valley State University's Peer to Peer START Project where permission was granted to modify materials to fit the needs of the site. Following the literature review, a site was secured at a middle school in the Midwest.

After modifying START Projects materials and creating materials to fit the middle school, a peer to peer program was created and partially implemented. It is anticipated the program will continue to be implemented through the rest of the school year and into the following years. With the success of the program at one middle school, development of a peer to peer program within the districts other middle schools can occur.

A need for more programs in schools to increase social interactions between students with and without disabilities was identified. In order to increase opportunities for social interactions to occur, a peer-mediated intervention approach was used in the form of a peer to peer program. Although implementation was limited, it is expected to have a positive impact on both students and the schools culture

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49. Enhancing the Service Delivery for Adolescents Using the Mental Health Continuum Through Occupational Therapy

Jadalyn Wagner, OTDS, Sarah Nielsen, PhD, OTR/L, FAOTA, Claire Mireau, PhD, OTR/L, TPS

Occupational Therapy Graduate Student

Background: An increase in children and adolescents experiencing mental health challenges in the United States has led to less than half not being able to access needed services. Untreated mental illness in adolescents leads to higher unemployment rates, decreased attendance for higher education, increased social isolation, and decreased engagement in meaningful activities. The mental health field currently does not have enough mental health providers to meet the needs of the population, leading to

long waitlists and increased distances needed to be traveled to receive necessary services. Occupational therapy can address this gap in mental health services by targeting the occupational performance of this population, which is often impacted by their mental health status.

Project Description: The “Supporting Occupational Therapy Service Delivery in Mental Health Systems from Adolescence through Adulthood” product was developed to describe occupational therapy’s value and role in adolescent mental health services and the services they receive as they transition to adulthood. This product contains two items to inform occupational therapy’s role and value in mental health services. The first component included the development and implementation of processes to track outcomes across the partnering agency’s sites, and the second half was the creation of training videos to describe occupational therapy’s role within the interprofessional teams at the different levels of care throughout the agency. The goal of the product was to provide ways to support occupational therapy’s position within a mental health clinical team through a defined way to track progress and materials to describe how occupational therapy can support recovery.

Results: The outcome process was trialed on-site and disseminated to occupational therapy practitioners within the paired agency. The training videos were developed and posted to the agency’s continuing education site.

Discussion: The implementation of the outcome process and training videos has increased the visibility of occupational therapy services to the interdisciplinary teams being worked with and the clients being served. Future goals with this product are to increase the number of occupational therapy practitioners entering the mental health field by removing the uncertainty about how occupational therapy can make a difference in clients’ lives.

51. Transitional Support Programming for First-Year Occupational Therapy Graduate Students

Samantha Proctor, OTDS, Anne M. Haskins, PhD, OTR/L, & Sarah Nielsen, PhD, OTR/L, FAOTA

Occupational Therapy Graduate Student

Background: The focus of the project represents the Scholarship of Application, which is the translation of existing research into practice. A student’s transition from undergraduate to graduate-level programs can be challenging due to the increased academic rigor inherent to graduate programs. This can lead to an imbalance in students’ lives and an increase in stress, anxiety, and burnout. As the overall well-being of students decreases, the likelihood of students experiencing academic hardships increases. Students need diverse academic and professional skills to navigate graduate school successfully; however, many students lack those skills. To mitigate the difficulties traditionally associated with transitioning into graduate school, universities throughout the U.S. have implemented transitional support programs for a variety of healthcare programs. Transitional support programs are proactive support systems designed to improve student performance and wellness by targeting skills required to be successful in graduate

school. The University of North Dakota’s (UND) Occupational Therapy (OT) Department and a third-year OT student collaborated to identify the needs of the Occupational Therapy Doctoral (OTD) Program related to the student population. The third-year OTD student conducted an in-depth literature review and ongoing

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formative needs assessment. This led to the creation of a transitional support program for the UND OT Department to utilize. The purpose of the program was to facilitate the acculturation of first-year students into the OTD program.

Project Description/Results: The project was designed to be implemented by UND's OTD Program during the fall semester for first-year graduate students. It specifically targeted the academic and professional skills needed to succeed in the OTD program, using education and occupation-based models as a guide. The project consists of resources for faculty, a weekly schedule, session plans and materials, evaluation tools, and official recommendations for sustainability.

Discussion: The program's structure and learning objectives could be used as a guide for other higher education departments to utilize; however, the generalizability of the program is contained to the OTD program when using the specific materials created for content delivery. The program's anticipated outcome is that it will give students the support needed to transition into graduate school and foster academic and professional success.

53. Bridges to Bright Beginnings; A Resource Guide for Caregivers of infants diagnosed with NAS

MaKayla Murden

Occupational Therapy Graduate Student

Background: Neonatal abstinence syndrome (NAS) is a condition that happens in newborn babies who were exposed to illicit substances or opiates while in the womb. The baby becomes dependent on the substances and will experience withdrawal symptoms after birth. Between 2010 and 2017, NAS births increased by 131%. Infants exposed to opioids in utero are at higher risk of Neonatal Intensive Care Unit (NICU) stays due to preterm delivery (CDC, 2022). Parents of infants with NAS often experience heightened stress (Cook et al., 2018; Suarez et al., 2018). Reducing stress and supporting the mental health of parents is crucial for supporting overall wellbeing and competency in caregiving (Suarez et al., 2018). In addition to mental health struggles, caregivers feel judged and alienated in the NICU which hinders their ability to care for their infant effectively. Lack of information and education on their infant's condition exacerbates feelings of isolation and makes caregiving feel overwhelming (Cleveland & Gill, 2013; Hames et al., 2021; Oostlander, et al., 2019; Purdy et al., 2015). Overall, the literature revealed gaps in occupation-based care, which emphasizes the need for education, psychological support, and personalized intervention plans for parents and caregivers of infants diagnosed with NAS.

Project Description: The purpose of the product is to create an evidence and occupation based resource guide to address the gaps identified in the literature. The product is a resource guide titled Bridges to Bright Beginnings; A Resource Guide for Caregivers of Infants Diagnosed with NAS. The resource guide was created for parents and caregivers of infants with NAS in the NICU. The guide includes pictures and easy to understand written information about their infant with NAS, how to support them, and supports that are in place after discharge from the NICU. There is a QR code present that will enable caregivers to have fast and convenient access to the guide.

Discussion: Bridges to Bright Beginnings aims to increase caregivers' engagement in caring for their infant, reduce feelings of alienation, and improve understanding of NAS care in the NICU (Cleveland & Gill, 2013; Hames et al., 2021; Oostlander, et al., 2019). The resource guide can be used to assist occupational therapists in providing personalized and occupation based care to families in the NICU with a baby diagnosed with NAS. The guide is backed by research and guided by theory.

55. Implementation of a Recreational Program for Those with Vision Impairments

Caitlyn Fussy, OTDS and Roberta Carrlson, PhD, OTR/L

Occupational Therapy Graduate Student

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Purpose: Quality of life can be found through participation in meaningful and rewarding occupations (Cote-Letterc, 2017). Studies have shown that individuals with visual impairments have impacted occupational performance and engagement in occupations leading to a loss of independence, changes to identity, and lowered self-esteem (Duquette, et. al., 2019; Kumar, et. al., 2022). Some barriers these individuals face that impact their ability to participate in meaningful occupations include having fewer

opportunities available, difficulty navigating, having impaired proprioception, accessibility, and physical or cognitive impairments (Diaz, 2019; Hill, 2023). Opportunities to engage in recreational activities presented as a clear need for this scholarly project.

Method: This project consists of a literature review and a needs assessment on recreational activities and the importance and benefits of implementing them for individuals with visual impairments. This also included understanding the limitations and barriers that are hindering the implementation of a recreational program for those with visual impairments. This project was guided by the Ecology of Human Performance (EHP; Dunn et. al., 1994). Through utilizing EHP the product utilized the connection between the person, task, and context to understand the individual's performance range to implement a recreational program for those with visual impairments (Dunn, 2017).

Results: To fulfill the need found in literature the author of the scholarly project partnered with a school for the blind in the Midwest to develop this program and accomplish this goal. The product included a recreational program for individuals with visual impairments. This program utilized current literature about recreational activities and the importance and benefits of participating in them for individuals with visual impairments. The program includes specific topics that target different needs, skills, and recreational needs for those with visual impairments based on the findings from the literature review.

Conclusion: The recreational program is an occupational-based and client-centered product that offers individuals with visual impairments an opportunity to engage in recreational activities. It is anticipated that the program will increase occupational participation and help individuals with visual impairment achieve a higher quality of life.

57. Exercise and Preventing Dementia in Older Adults

Valerie Snelling, PA-S and Jeanie McHugo, PhD

Physician Assistant Graduate Student

Dementia is a devastating diagnosis for millions of individuals and the prevalence is projected to increase significantly in the next 30 years. According to the Centers for Disease Control and Prevention (2019), there are over five million individuals aged 65 and over living in the United States with dementia. That number is estimated to increase to 14 million by 2060. The impact of the increasing prevalence of dementia is significant. Because dementia is a complex disease caused by over 50 underlying health conditions, finding effective treatments for the disease is difficult. This makes prevention of dementia extremely important. The purpose of this literature review is to analyze if exercise prevents dementia in older adults. Studies were included if they analyzed physical activity with the onset of dementia or changes in various cognitive abilities. This literature available to date indicates that exercise is an effective measure to prevent dementia in older adults. Current research has shown that dementia prevention should be included in education about the benefits of exercise.

59. Viral Bronchiolitis: High Flow Nasal Cannula versus Non-Invasive Ventilation Management's Effect on Length of Stay, Prevention of Mechanical Ventilation, and Mortality

Justis Caldwell PA-S and Jay Metzger, Ph.D., PA-C

Physician Assistant Graduate Student

Viral bronchitis is a disease process most common in children under two years old. Bronchiolitis is caused by inflammation of the epithelial cell lining of the small airways in the lungs. This causes increased mucus

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production and inflammation that can cause necrosis of these cells. The inflammation and increased secretions cause an obstruction in the lower airways that results in wheezing. The most common

causative pathogen is respiratory syncytial virus, but other common viruses, including adenovirus, human metapneumovirus, influenza, and parainfluenza, can also cause it.

A literature review was performed using the electronic search database PubMed. Keyword and mesh terms were used to define a set of literature discussing the use of high-flow nasal cannula versus continuous positive airway pressure in the management of viral bronchitis in pediatric patients. The search revealed 37 studies. All searches were narrowed down to the last five years. Studies that included nebulized, pharmacological treatments were excluded. There were ten studies that met the final criteria.

The literature suggests that the use of CPAP for initial treatment had better success in not escalating support, but patients on CPAP typically had a longer length of stay. This could have been because if the patient had to be on CPAP, then they had more severe bronchiolitis. There is also the factor of the patient's discomfort with using CPAP. This could cause the need for some sedation to make them more comfortable with the device and also a need for weaning off the sedation. There was no difference in the intubation rate between the two support modes.

61. The Efficacy of GLP-1 Agonists in Pediatric Patients with Type 2 Diabetes and Obesity

Cayla Mahrer PA-S; Contributing authors: Russ Kauffman, MPAS, PA-C & Jay Metzger, PhD, PA-C

Physician Assistant Graduate Student

In recent years, GLP-1 therapies have emerged as promising inventions for managing type 2 diabetes and obesity in adolescents. This comprehensive literature review synthesizes findings from fundamental studies, highlighting the efficacy, safety considerations, and potential variations in treatment outcomes associated with GLP-1 therapies in this demographic.

The literature consistently supports the effectiveness of GLP-1 therapies, such as liraglutide, dulaglutide, and exenatide, in improving glycemic control, as evidenced by significant reductions in HbA1c levels. Additionally, these therapies often lead to favorable outcomes in terms of weight reduction, addressing a critical aspect of type 2 diabetes and obesity management in adolescents. However, safety concerns and gastrointestinal effects have been noted, emphasizing the importance of monitoring and managing potential side effects during GLP-1 therapy. Insights from studies evaluating the safety and tolerability of specific GLP-1 agents, including lixisenatide, provide valuable information for healthcare providers. While there is consensus on the general effectiveness of GLP-1 therapies, variation-specific outcomes and long-term effects remain subjects of debate. Some studies, including case-based investigations, suggest potential variations in treatment responses, necessitating further exploration and extended follow-up periods. This literature review is a practical guide for healthcare professionals, bridging the gap between research findings and clinical application. It empowers clinicians to make well-informed decisions when initiating GLP-1 therapy, considering individual patient needs and enhancing the overall quality of care for adolescents with type 2 diabetes and obesity.

64. Congenital dislocation of the knee in the delivery room

Benjiman J Wilebski, Ambereen Alam, Russell R Lambert, Miltiadis Douvoyiannis

Medical Student

Background: Congenital dislocation of the knee (CDK) is rare and can cause significant distress in the delivery room to both the parents but also to the health care providers, especially if the latter are unaware of this condition. It may not be detected by prenatal ultrasound and can be either an isolated finding or associated with other anomalies such as developmental hip dysplasia and genetic syndromes such as Larsen syndrome. Because of the risk of development of contractures, immediate referral to a specialized

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provider should be done. Poor prognostic factors include an association with a genetic syndrome, limited knee flexion related to severe quadriceps retraction, and absence of anterior skin grooves. A satisfactory outcome can be anticipated in isolated cases with easy reducibility of the knee.

Case report: A term baby presented unexpectedly with left knee dislocation after delivery. The providers, unaware of the condition, consulted immediately orthopedic service who assisted in the diagnosis and appropriate management was initiated. The baby had serial casting of the leg, which was applied for almost 3 months, with excellent results on the clinical examination.

Discussion: CDK is a rare finding. The diagnosis is primarily clinical, and radiographs are used to confirm and assess the degree of the dislocation. The degree of dislocation is important for management and prognosis. Intervention that ranges from serial casting to surgery must be made as soon as possible. As the CDK can be associated with genetic syndromes or other dysplasias such as developmental dysplasia of the hip and talipes equinovarus, further evaluation for these conditions is warranted.

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Video Presentations

83. SLFN12 Overexpression Significantly Effects the Response to Chemotherapy Drugs in Triple Negative Breast Cancer

Savannah Brown, Emilie E. Vomhof-DeKrey Trysten Beyer, Bo Lauckner, Sarah Sattar, Nicholas D. Brown, and Marc D. Basson.

Clinical & Translational Science Graduate Student

Schlafen12 (SLFN12) is an intermediate human Schlafen protein shown to have a correlation with survivability in triple negative breast cancer (TNBC). SLFN12 causes differential expression of important cancer genes and other SLFN family members, but how they change in response to chemotherapy remains unknown. Our aim is to identify the effect of chemotherapy on genes that improve TNBC outcome and other SLFN family members following SLFN12 knockout or overexpression. To evaluate this relationship, we overexpressed SLFN12 (EV-SLFN12) using a lentiviral vector and knocked out SLFN12 (AdvShSLFN12) using a hairpin adenovirus in MDA-MB-231 TNBC cells. Cells were treated with camptothecin (CPT), paclitaxel, zoledronic acid (ZA), or carboplatin to evaluate SLFN12 signature cancer genes associated with better TNBC using qPCR. Additionally, cells were treated alone and in combination with AdvShSLFN12, IFN- α 2 (a known stimulator of SLFN12), and carboplatin or paclitaxel. After treatment, viable cell numbers were analyzed utilizing a colorimetric crystal violet assay for cell viability and mRNA expression by RT-qPCR. Treating SLFN12 overexpressing TNBC cells with chemotherapy agents resulted in differential expression of eight carcinogenic genes. Notably, GJB3 a prognostic marker increased in basal-like BC and after BC metastasis, was downregulated following treatment with each chemotherapy agent evaluated. SLFN12 induction with IFN- α 2 resulted in decreased cell proliferation and increased SLFN12 mRNA levels following treatment with paclitaxel or carboplatin. These results suggest that SLFN12 overexpression significantly effects the expression of genes driving phenotypic changes in response to chemotherapy drugs. This may contribute to improving survival for patients with SLFN12 overexpression. Additionally, patients SLFN12 levels can be used as a factor when pursuing personalized chemotherapy treatments.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

84. Interoceptive Learning Across Environments: A Handbook for Educators and Caregivers

Jamie M. Steinhoff, OTDS

Occupational Therapy Graduate Student

Introduction: Children aged four to six experience rapid brain development, advancing language skills, and understanding of the human body (Schaan et al., 2019). This developmental stage highlights the importance of educators and caregivers teaching interoception to improve preschool-aged children's occupational engagement and emotional regulation. Children lacking developed interoceptive skills may encounter difficulties regulating their emotions, impacting activities such as play, social participation, education, and health management (Arnold et al., 2019). This product was developed to offer caregivers and educators a comprehensive understanding of interoception through a handbook and training sessions containing strategies, exercises, tools, and activities to facilitate interoceptive development in children.

Methodology: To identify strategies for improving occupational performance and the advantages of early interoceptive awareness, a literature review was conducted through PubMed and Google Scholar. Additionally, interviews and informal surveys were conducted, and classroom observations were performed. Throughout the development process, the Person-Environment-Occupation (PEO) model by Baptiste (2017) and Maslow's Hierarchy of Needs by McLeod (2023) were used as frameworks.

Results: The projected outcome of this product is to provide caregivers and educators with a deeper understanding of interoception, guidance on developing interoception in children, and access to various

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interoception strategies, exercises, tools, and activities. Upon completing the training, caregivers and educators are anticipated to feel more confident utilizing the handbook as a resource. Additionally, it is anticipated that children will benefit from the handbook by increasing their engagement in various occupations leading to improved emotional regulation and enhanced self-efficacy across different environments.

Conclusion: The Interoceptive Learning Across Environments handbook serves as a resource for educators and caregivers, intending to enhance children's interoception to improve their occupational performance. The training aims to offer caregivers and educators guidance and support as they learn strategies, exercises, tools, and activities to help children recognize and understand interoception. The handbook and training provide essential resources to promote effective communication and a collaborative approach to interoceptive development.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

85. Utilizing Occupation-Based Activities to Support Participation in Educational Tasks within the General Education Classroom

Molly Van Drehle, OTDS; Wanda Lauer, OTD, OTR/L

Occupational Therapy Graduate Student

Background: The rise of technology usage has decreased the number of hands-on activities children participate in, impacting significant life skills (Caramia et al., 2020; Dadson et al., 2020; Gaul & Issartel, 2016; Genevieve et al., 2018; Lin et al., 2017). This trend has impeded children's ability to develop and strengthen the necessary skills to complete school-related tasks (Caramia et al., 2020; Dadson et al., 2020; Gaul & Issartel, 2016; Genevieve et al., 2018; Lin et al., 2017). Performing hands-on tasks builds fine motor skills, which are the small muscles of the hands that help with handwriting, cutting with scissors, zipping jackets, tying shoes, and opening milk cartons (Cameron et al., 2016; Fogo et al., 2020; Ohl et al., 2013). Children who have underdeveloped skills struggle with performance in writing, reading, spelling, and math and are at risk of falling behind (Cameron et al., 2016; Fogo et al., 2020; Michel et al., 2019; Ohl et al., 2013; Senapati, 2017).

Purpose: This scholarly project aimed to create a product containing occupation-based activities for kindergarteners to utilize within the general education classroom. The activities in the product provide hands-on experiences that allow students to develop skills needed for school participation. The product is entitled The Activity Tree: Toolkit & Resource for Enhancing Excellence.

Methodology: To complete the needs assessment, evidence was gathered through a literature review, skilled observation, and collaboration with kindergarten teachers, a school-based occupational therapist, an art teacher, a gym teacher, social workers, and special education teachers. The Ecology of Human Performance (EHP) was the theoretical framework used to guide this scholarly project's creation and the product's development (Dunn, 2017).

Conclusion: The Activity Tree: Toolkit & Resource for Enhancing Excellence was created to address the need for more hands-on opportunities for kindergarteners in the classroom. The outcome of the scholarly project resulted in 31 activities that target fine motor, executive functioning, and visual motor skills necessary for educational participation and academic success. Each activity has multiple methods to meet the needs of kindergarteners of all ability levels within the general education classroom.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

86. Supporting Community Integration for Veterans with Mental Health Conditions Through the Lens of Recovery: RISE-ing Together

Erin M. Ferebee, OTDS, Cherie Graves, PhD, OTR/L

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Occupational Therapy Graduate Student

Background: In the United States, more than 2.2 million military Veterans are burdened by mental illnesses like posttraumatic stress disorder (PTSD), depression, and psychotic disorders, impairing their daily functioning and overall quality of life (VA, 2019). Unfortunately, pervasive stigma within the Veteran community often prevents individuals from seeking mental health treatment, contributing to the alarming rates of suicide among Veterans (Phelan et al., 2018). Transitioning into civilian life presents numerous challenges for Veterans, further complicated by mental health issues and other factors such as education, relationships, and deployment history, creating barriers to successful community reintegration. Despite existing resources and interventions, notable gaps persist, leaving many Veterans underserved and struggling to navigate the transition effectively (Culbreth et al., 2013; Koenig et al., 2014; Taylor et al., 2020).

Product Description and Results: This project aims to enhance community integration for Veterans with serious and persistent mental illness (SPMI) through the development of tailored interventions within an existing program at a regional VA Outpatient Clinic. Three key components were developed: "Rediscovering You," a program handbook for Veteran participants in the RISE program; "The RISE Program," a brochure for providers to facilitate increased referrals; and "Coping Through the Senses," a 10-week occupational therapy protocol targeting sensory processing and coping skills. Anticipated outcomes include improved clarity of RISE services for practitioners and enhanced recovery journeys for Veterans, ultimately leading to increased community integration and overall well-being.

Discussion: "Supporting Community Integration for Veterans with Mental Health Conditions Through the Lens of Recovery: RISE-ing Together" underscores the commitment of the VA and the American Occupational Therapy Association (AOTA) to enhance Veterans' well-being during community reintegration (AOTA, 2020). Grounded in theory, it emphasizes the vital role of OT practitioners and offers evidence-based protocols to facilitate successful community reintegration. The implementation of tailored group protocols is expected to enhance Veterans' confidence and self-management skills while fostering interdisciplinary collaboration. Future studies may explore the broader implementation of these protocols and their impact on Veterans' long-term outcomes.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

87. Providing Occupation-Based Mental Health Care for LGBTQ+ Youth Through Telehealth Service Delivery

Hannah Leisenheimer, OTDS

Occupational Therapy Graduate Student

Purpose: A significant percentage of lesbian, gay, bisexual, transgender, and queer or questioning (LGBTQ+) youth in the United States report experiencing significant mental health challenges, yet they face major challenges when it comes to seeking out and receiving mental health care (The Trevor Project, 2022). As a result of the COVID-19 pandemic and rapidly expanding technologies, telehealth services have become a norm in the healthcare field (Centers for Disease Control and Prevention, 2022; Whaley & McBain, 2023). However, there is a lack of evidence on how to incorporate meaningful, occupation-based interventions to address these mental health needs into telehealth services (Duffy et al., 2022; Proffitt et al., 2021). The purpose of this scholarly project and the associated product is to provide mental health

practitioners with a comprehensive guide of resources that are compatible for use in virtual contexts in order to improve the meaningfulness and effectiveness of telehealth-based interventions, specifically with LGBTQ+ youth.

Methods: A literature review was completed using CINAHL, PubMed, Google Scholar, and OT Search to identify supports and barriers in telehealth service delivery and research meaningful, occupation-based interventions for LGBTQ+ youth. Additionally, informal interviews were conducted with clinical staff to assess specific client needs. The Model of Human Occupation (O'Brien, 2017) and the Adaptive Internal

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Relational Network Model (McClelland et al., 2015) were also used as a theoretical framework to guide the development of the scholarly project and the associated product.

Results: The culminating product of this scholarly project, Telehealth Resources for LGBTQ+ Youth and Young Adults, is a virtual resource guide for occupational therapists and other mental health practitioners. It contains telehealth-friendly therapeutic materials and support services specific to LGBTQ+ youth, their unique mental health challenges, and their valued occupations.

Conclusion: This product was created to provide occupational therapists and other mental health practitioners with an all-inclusive guide to providing mental health services to LGBTQ+ youth via telehealth. It is anticipated that the utilization of this product will improve the quality, effectiveness, and meaningfulness of mental health services delivered via telehealth.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

88. A Holistic Approach to Occupational Therapy Intervention: Addressing Psychosocial Factors and Upper Extremity Injuries

Aleece Durbin

Occupational Therapy Graduate Student

Purpose: Occupational therapy practitioners (OTPs) working in a hand therapy practice setting primarily focus on neuromusculoskeletal injuries of the upper extremity (UE) (Kurrus et al., 2023). However, clients who experience UE injuries can also experience adverse psychosocial factors limiting their performance in daily activities (Kurrus et al., 2023). Psychosocial factors are rarely addressed in the practice setting due to institutional barriers and a lack of confidence by OTPs in their ability to address psychosocial factors (Kurrus et al., 2023). This project aims to provide OTPs with resources to provide occupational therapy intervention to address psychosocial factors despite the barriers present within the practice setting of hand therapy.

Methods: A literature review was conducted to determine the barriers to addressing psychosocial factors in the practice setting. Databases, government sites, and professional organizations searched included CINAHL, PubMed, PsychInfo, Medline, the Center for Disease Control and Prevention, the National Institutes of Health, the American Society of Hand Therapists, and the American Occupational Therapy Association. Interviews with OTPs practicing in the practice setting and personal hands-on experience providing occupational therapy services in the practice setting also informed barriers to be addressed by this project. Once the barriers of the practice setting were identified, a toolkit of resources was developed for OTPs to use within the practice setting to address psychosocial factors limiting occupational performance.

Product: The product is a toolkit that includes nine educational handouts that can be completed by clients, and a facilitation guide for OTPs. The facilitation guide includes education on multiple facilitation methods like in-session approaches, out-of-session approaches, and multiple mediums for facilitation including paper, electronic applications, and verbal facilitation.

Conclusions: The toolkit effectively overcame barriers identified in the practice setting. The toolkit provides handouts that can be completed both in-session and out-of-session, overcoming institutional barriers related to time, space, and expectation of neuromusculoskeletal-focused interventions. The practitioner's guide helped overcome barriers related to practitioner confidence by educating OTPs on physical and verbal facilitation techniques to implement psychosocial intervention in the hand therapy practice setting.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

89. Addressing Burn Scarring and Contractures While Measuring Range of Motion

Josie Sylte and Nicole Harris

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Occupational Therapy Graduate Student

Purpose: In the community of healthcare professionals that work with individuals who have survived a burn injury there has been a shift in the way that range of motion (ROM) is being measured taking into consideration the use of cutaneous functional units (CFUs), multi joint movements, and burn scarring and contractures (Parry et al., 2019). Working with a burn intensive care unit therapy team a need was identified to address therapist education and the integration of revised positioning for measuring ROM following a burn injury and throughout the rehabilitation process.

Method: To determine the needs of the burn facility a needs assessment was completed comprehensive literature review. After observation of current practices, evaluation, and discussion with the therapy team, it was determined that a handbook detailing information related to the importance of measuring ROM and the use of CFUs was the best method for educating therapists. Collaboration with the therapy team was imperative to determining the information that was included in the handbook.

Results: After the handbook was created there was an educational meeting with the therapy team to discuss the information in the handbook. The therapists utilized the positioning used for measuring ROM using CFUs with other therapists before implementing into patient care. Therapists are still working towards integration of the procedure and are continuing to provide feedback related to the useability of the handbook.

Conclusions: The handbook provides the information that therapists determined was beneficial for measuring ROM following a burn injury. It is expected that this information will be utilized to train therapists who are transitioning to working on the burn unit and provide a resource guide for therapists working with burn survivors.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

90. Making Strides: An occupational therapy program developing work readiness skills in adolescents with ACEs, using equine and barn tasks

Lauren Fischer, OTDS and Cherie Graves PhD, OTR/L

Occupational Therapy Graduate Student

Background: The Center of Disease Control and Prevention (CDC, 2022) defines adverse childhood experiences (ACEs) as any traumatic event that occurs from birth to 18 years. ACEs can lead to various issues in the child's future, such as health problems, mental illness, substance abuse, and challenges with education and employment (CDC, 2022). Associated barriers that inhibit at-risk youth when transitioning into the workforce include lack of work skills, habits, knowledge about labor rights, realistic

job opportunities, and how to pursue employment (Ivzori et al., 2020). Increasing support in their pre-vocational skills can increase their success in employment. Rhew et al. (2019) identifying the following skills as key for successful employment - communication, decision-making, teamwork, relationship-building, critical thinking, time management, responsibility, and accountability.

Purpose: The purpose of this scholarly project was to develop a group based program using equine and barn chores to promote the development of these eight work skills. The Making Strides program is intended to bridge the gap between unemployment, transition to work, and development of worker readiness skills for adolescents with ACEs to be successful into adulthood by utilizing both barn chores and equine.

Methods: A literature review was conducted to understand the effects of ACEs, unemployment rates, the adolescent population, and the benefits of equine therapy and barn chores. The Ecological Human Performance (EHP) model guided the questions through the literature search and the overall development of the program (Dunn, 2017).

Results: Making Strides was designed as an occupational therapy based program utilizing Cole's Seven Steps with interprofessional collaboration (Cole, 2018). The program is a six week program that will be held

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twice a week. Each week is focused on utilizing horses or barn chores to target one of the eight skills identified by Rhew et al. (2019).

Conclusion: This program gives students the opportunity to build foundational work readiness skills with hands-on learning to enhance each skill utilizing horses and barn chores. This program also allows students to apply these skills in and outside of the facility for better retention.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

91. Increasing Quality of Life and Well-Being Among Older Adults Living in an Assisted Living Facility Through Engaging in a Wellness Program

Hannah Steckler, OTDS, and Cherie Graves, PhD, OTR/L

Occupational Therapy Graduate Student

Purpose: The focus of this scholarly project was to create a group protocol to increase the quality of life and well-being of older adults living in an assisted living facility (ALF). Furthermore, it promotes increased engagement in meaningful activities to combat health disparities and provide education on various areas of wellness. Older adults' quality of life and well-being are impacted when residing in an ALF due to decreased engagement in wellness activities (Bartley et al., 2018; Morgan et al., 2016). Furthermore, risk factors and health disparities increase among the older adult population, which causes a negative impact on everyday routines (Jansson et al., 2021; Plys & Qualls, 2020).

Method: A literature review was conducted to explore the needs and disparities surrounding older adults living in ALF. To guide the development of this group protocol, the Environment Health Occupation Well-Being (E-HOW) model (Pizzi & Richards, 2017), the eight dimensions of wellness (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016), and the geragogy learning theory (Bastable et al., 2020) were utilized. Evaluation measures relating to quality of life and well-being were also reviewed and selected to measure the outcomes of the wellness program.

Results: The created product is an eight-week wellness program with meaningful, occupation-based, evidence-based activities and interventions. The program's hands-on activities and educational materials designated to different dimensions of wellness promote the transfer of skills to everyday routines and habits. An individual of any profession can administer the wellness program within an ALF, however program evaluation requires collaboration with an occupational therapy practitioner.

Conclusions: This program provides meaningful education and occupation-based activities for physical, social, emotional, intellectual, occupational, environmental, financial, and spiritual wellness. Group members will also gain education and skills to increase their quality of life and well-being.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

92. Developing a Sensory Room for Children with Autism Living on the Navajo Reservation

Rudessa Bedonie, OTS, Andrea Young, OTD, OTR/L

Occupational Therapy Graduate Student

Purpose: Autism spectrum disorder (ASD) is a developmental disability characterized by challenges in social interaction, communication, and restrictive or repetitive behaviors (Hirota & King, 2023). Children with autism demonstrate sensory challenges impacting their participation in activities of daily living and social engagement (Schaaf et al., 2014 & Travers et al., 2022). Occupational therapists often employ techniques and settings to enrich sensory experiences when working with children diagnosed with autism. Accessibility and awareness of occupational therapy services on the Navajo reservation are also restricted (Casimir, 2023).

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People on the Navajo reservation may experience cultural and language barriers with others, and limited resources due to its rural location. The purpose of this project was to establish a sensory room tailored for children with ASD residing on the Navajo reservation within a clinical setting. Additionally, educational resources were developed for parents and caregivers to enhance their comprehension of ASD and explore diverse strategies to address the sensory requirements of the child.

Method: An extensive literature review was conducted to obtain information to design a sensory room utilizing evidence-based strategies for health professionals and families to use for children with ASD. The author gathered evidence from various databases, publications, textbooks, and professional organizations. The Ecology of Human Performance (EHP) model and the Sensory Integration Frame of Reference were used to develop this project (Cho, 2010; Dunn, 2017).

Results: Ancillary to the sensory room is a guide for occupational therapists and other health professionals. The guide has information for creating and implementing a sensory room in a clinical setting. It also gives parents or caregivers education about ASD, sensory challenges, strategies to use, and resources to help engage children with ASD in meaningful occupations. The guide's outline includes an introduction, describes the models used, instructions for implementation, a documentation form, sensory room blueprint, equipment listing, and parent education.

Conclusion: This product was developed to give occupational therapists and other health professionals working on the Navajo reservation the resources to create a sensory room. It is anticipated that this product will provide information and materials to guide the creation of a sensory room for children with autism experiencing sensory challenges and will continue to grow to reach other populations.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

93. Enriching Social Connections: A Handbook for Occupational Therapy Practitioners

Lauryne P. Griego

Occupational Therapy Graduate Student

Introduction: Children and adolescents with neurological or neurodevelopmental disorders often face significant challenges in navigating social relationships, impacting their ability to engage meaningfully (

Hilton & Kramer, 2020). Deficits in communication can hinder successful participation in social events, affecting overall success (Hilton & Kramer, 2020). Social participation, crucial for development, fosters belonging and enhances health and well-being. Occupational therapy is instrumental in supporting children and adolescents in overcoming social challenges and engaging meaningfully.

Methodology: An extensive literature review was conducted through evidence-based resources from a combination of online databases, published books, professional organizations, and governmental websites. The product development was guided by the person-environment-occupation (PEO) model (Law et al., 1996). The PEO model was used to analyze the specific abilities and competencies of children and adolescents with Autism Spectrum Disorder (ASD) and Attention Deficit Hyperactivity Disorder (ADHD), as well as the social environment, and its profound influence on social engagement and participation.

Results: The product, Enriching Social Connections: A Handbook for Occupational Therapy Practitioners, provides tailored interventions to support social skills development in children and adolescents with ASD and ADHD. Its sections on goal setting, screenings, intervention activities, caregiver support, and recommended resources directly support occupational therapy practitioners in implementing effective interventions for social skills development.

Conclusion: This handbook empowers pediatric occupational therapists to enhance social skills in children with neurological and neurodevelopmental disorders, promoting life engagement. The implementation of the product, along with the dissemination of accompanying research and other relevant resources, is expected to contribute to the further development of social skills in children.

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Significance: Social interaction is crucial for human health and well-being (Deckers et al., 2016). Individuals with ASD and ADHD face barriers to meaningful social engagement. Social skill development is vital for societal participation and overall well-being. This handbook addresses these needs, supporting social inclusion and successful occupational participation.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

94. The Virtual Therapist: An Occupational Therapy Practitioner's Guide to Telehealth Service Delivery in Pediatrics

Hannah Gianan, OTDS, Julie Grabanski, PhD, OTR/L, and Brian Woodbury, MOTR/L

Occupational Therapy Graduate Student

Purpose: The purpose of this scholarly project was to improve the telehealth competency and confidence of occupational therapy practitioners working in pediatrics through the use of a quick reference resource guide.

Methodology: The development of The Virtual Therapist: An Occupational Therapy Practitioner's Guide to Telehealth Service Delivery in Pediatrics was guided by the concepts found in the Ecology of Human Performance model (Dunn, 2017). The concepts of person, context, and task were used in the overall creation of the guide, while the five intervention strategies outlined in the model were used in the creation of the intervention plan section. A literature review using the keywords of "telehealth", "occupational therapy", and "pediatrics" was used to identify the need for the resource guide.

Results: The Virtual Therapist: An Occupational Therapy Practitioner's Guide to Telehealth Service Delivery in Pediatrics, was created to improve practitioner confidence in delivering skilled occupational therapy services via telehealth. The resource guide's five sections provide therapists with educational materials, graphics, and intervention activities for effective telehealth implementation. It was the ultimate goal that occupational therapy practitioners use the guide to improve their telehealth competency and in turn offer telehealth services as an integrated part of their occupational therapy practice.

Conclusion and Significance: The Virtual Therapist: An Occupational Therapy Practitioner's Guide to Telehealth Service Delivery in Pediatrics was created to aid occupational therapy practitioners when preparing for and implementing telehealth sessions by providing orientation to telehealth concepts, intervention ideas, and parent education material. In turn, it was intended to improve occupational therapy practitioner competence and confidence when providing telehealth services to pediatric clients and improve access to occupational therapy services via telehealth.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

95. Nature-Based Therapy Supporting Veterans with Mental Health Difficulties

Kaitlyne A. Dittberner and Cherie Graves

Occupational Therapy Graduate Student

Background: Using nature has been linked to improvements in well-being for individuals with depression, anxiety, and post-traumatic stress disorder (Bettmann et al., 2019). Combining nature with physical activity can increase feelings of revitalization, positive engagement, and energy with decreased feelings of tension, confusion, anger, and depression (Coon et al., 2011). Group-based activities for veterans can assist with the reintegration process back into the community as combat veterans value connections with like peers (Hawkins et al., 2016). Occupational therapy practitioners have the skills to analyze activities to make accommodations to allow veterans to be successful in the occupations in the nature-based sessions regardless of the mental health challenges present.

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Project Description: This program aims to provide an opportunity for veterans with mental health difficulties to engage in a non-traditional approach to therapy to reduce the barrier presented by the veterans' stigma around mental health treatment (Bettmann, 2019). The purpose of this program is to increase well-being through engagement in nature-based therapy by incorporating social participation, rest/sleep education, activities to provide increased life purpose and satisfaction, and growth in self-confidence by teaching new skills. Additionally, the program targets engagement in leisure activities, enhances sensory regulation skills, uses purposeful activities for self-care, and provides opportunities to practice skills for productivity and work.

Discussion: The program was developed for sustainability by including evaluation measures, goals, objectives, and marketing strategies. To promote the program, clear language was used and sessions were intentionally designed to target individual's goals. There are three recommendations for further development of the product in the future. First, adaptive equipment would be beneficial to incorporate in each session to increase inclusivity for the population. Next, partnering with the VA or other well known veteran supporters to increase access for individuals who are financially unable to participate. This will also enhance the marketing of the programming to provide information of additional resources that are available to the population. Lastly, peer-led programs would increase participation and engagement in the program along with the availability of more sessions to be implemented.

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96. A Resource Guide For Improving Participation in the Pediatric Casper Community

Rylie M. Garner

Occupational Therapy Graduate Student

Introduction: Typically developing children participate more in social, physical, and recreational activities than children with disabilities (Solish et al., 2010). Identified barriers that decrease participation for

children with disabilities include high costs, accessibility and accommodations, and lack of knowledge of facilities, programs, and sports (Aytur et al., 2018). Participation in recreational activities promotes inclusion, improves physical functioning, and enhances overall quality of life (QoL) (Murphy & Carbone, 2018). There is a clear need to find the "missing link" to improve QoL and encourage participation in the special needs pediatric population.

Methodology: This scholarly project included a literature review, clinical needs assessment, and the Person-Environment-Occupation (PEO) model as a guiding theory (Law et al., 1996). A synthesis of the literature, exploration and assessment of available resources, along with the use of the PEO model, directed the steps taken to create a resource guidebook to assist children with disabilities and their families in locating recreational activities that are available in the semi-rural community in Wyoming.

Results: It's anticipated that this resource guidebook will enhance knowledge and participation in leisure, social, physical, and recreational activities for children with disabilities.

Conclusion: The product created from this scholarly project addresses the "missing link" that the special needs pediatric population faces when participating in community recreation. This resource guidebook enhances knowledge and participation to prompt engagement and increase overall QoL.

Significance: It is expected that with the implementation of this product, recreational participation will increase in the special needs pediatric population. It is also expected that this product will expand on the current resources and information this population has access to and be a tool for community members to utilize for improving the QoL of children with disabilities.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

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97. Breaking the Barrier to Leisure Engagement in Long-Term Care Facilities to Enhance Residents' Health, Well-being, and Quality of Life

Callie M. Kleindl

Occupational Therapy Graduate Student

Purpose: The purpose of this scholarly project was to promote leisure engagement for residents with dementia in long-term care (LTC) facilities to enhance their overall health, well-being, and quality of life (QOL).

Methodology: A thorough literature review supported the need for increased leisure engagement in LTC facilities for residents with dementia. Chronic conditions, such as dementia, impact a resident's ability to engage in meaningful occupations which leads to occupational deprivation. In addition, a decline in leisure engagement has been found to negatively impact one's health, well-being, and QOL. The product of this scholarly project was created with the Environment- Health-Occupation-Well-being (E-HOW) model and the Cognitive Disabilities Model (CDM) as a guide.

Results: A manual was created titled Breaking the Barrier to Leisure Engagement in Long-Term Care Facilities to Enhance Residents' Health, Well-being, and Quality of Life to increase leisure engagement for residents with dementia in LTC facilities by creating activities specific to their level of cognition. The manual included information on Allen Cognitive Levels (ACL), activity selection and set up, and appropriate cueing.

Conclusion: It is anticipated that Breaking the Barrier to Leisure Engagement in Long-Term Care Facilities to Enhance Residents' Health, Well-being, and Quality of Life will enhance the quality of life of residents with dementia living in LTC facilities through engagement in leisure activities. The manual

serves as a guide to creating leisure activities specific for residents with dementia by incorporating their interests while taking into consideration their level of cognition.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

98. Inclusive Physical Education and its Impact on Adolescents with Disabilities in a School Setting

Ashley Freund, OTDS and Mandy Meyer, PhD

Occupational Therapy Graduate Student

Background: Adolescents with disabilities frequently encounter barriers preventing participation in physical education alongside their peers. The absence of inclusive practices and adaptations tailored to students with disabilities poses challenges that impact students' physical health and mental well-being (Carbone et al., 2021). Fostering improved mental and physical health for adolescents with and without disabilities is related to group-based programming as well as instructor leadership and knowledge regarding disability and activity modification (Shirazipour et al., 2020). By integrating these elements, physical education teachers can optimize the benefits of participation in physical education, including enhanced mental health, increased physical participation and engagement, and improved social participation.

Purpose: The purpose of this project is to provide education and program structure to physical education teachers who specialize in adaptive physical education. This project aims to increase participation and engagement in physical education and enhance the overall well-being of adolescents with disabilities. Implementing adaptive physical education will increase opportunities for adolescents to participate with their peers in physical education and increase overall participation for students with disabilities.

Methods: A thorough literature review was conducted to explore the supports and barriers to participation and engagement in physical activity for students with disabilities as well as the physical and social benefits that result from increased participation in physical education. The literature search included the exploration of various online databases including PubMed, and CINAHL, as well as governmental databases and the

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American Occupational Therapy Association (AOTA). The Ecology of Human Performance model was utilized to guide this scholarly project and the development of the product (Dunn et al., 1994).

Conclusion: Adolescents benefit significantly from engaging in physical activity, as it plays a crucial role in enhancing their physical and social participation. Inclusive Physical Education: A Guide for Physical Education Teachers was created to aid teachers in integrating activities and modifications into their curriculum, ensuring sufficient opportunities for both students with disabilities and those without. The program guide will provide structure for educators and promote participation and engagement for adolescents.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

99. Toolkit for Teachers Who Have Students Who Have Experienced ACEs: An Occupational Therapy Guide

Abigail Kasper, Dr. Kelly Dornbier

Occupational Therapy Graduate Student

Background: Individuals who experience trauma are at a higher risk of experiencing decreased occupational performance, specifically in education. Students are more likely to have decreased

emotional and sensory regulation, decreased attention, problem-solving, and social skills, and struggle to transition between activities (Bhushan, 2021; Goddard, 2021; Fraser et al., 2019; Whiting, 2018). These difficulties can create barriers to participating and succeeding in education. In addition to experiencing barriers while engaging in school, trauma can also result in an increased risk of experiencing long-term health impacts, such as heart disease, obesity, depression, hypertension, and other chronic conditions (Bhushan, 2021; Centers for Disease Control, 2022; Felitti et al., 1998; Petrucelli et al., 2019).

Purpose: The purpose of this scholarly project was to create a toolkit that can be used to inform educational professionals about the impacts trauma has on students, provide environmental adaptations that can be implemented in the classroom, and provide activities that can help decrease barriers experienced after experiencing trauma.

Methodology: The product was developed following a comprehensive literature review that focused on traumas impacts on children and interventions that can be used in the school setting to help students who have experienced trauma. The needs assessment was completed after arriving on-site to determine additional needs. The ecology of human performance (EHP) was used to guide the research and development of the product (Dunn, 2017).

Results: The toolkit created includes three sections. The first provides a brief background on trauma and its impacts on children and their education. The second includes environmental modifications and adaptations that can be implemented in the classroom. The third contains several class activities that focus on overcoming barriers experienced when a child has a history of trauma. The product has not been implemented yet; however, the toolkit is anticipated to increase teachers' understanding of trauma and its impacts on students, and students will experience increased occupational performance in school.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

100. An Interdisciplinary Approach to Fall Prevention in Rural Health

Casidi C. Pullar, OTDS and Breann Lamborn, Ed.D., M.P.A.

Occupational Therapy Graduate Student

Hospital-acquired falls can lead to severe injuries and complications, posing significant challenges for patient safety and the healthcare facility (Agency for Healthcare Research and Quality, 2023). Healthcare workers in rural, Critical Access Hospitals often handle a wide range of responsibilities due to the smaller

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staff size, limited resources, and difficulty retaining or recruiting staff due to the remote location, typically resulting in fall prevention being less prioritized (Abelsen et al., 2020; Agency for Healthcare Research and Quality, 2023). Addressing patient safety and fall prevention strategies is an organizational and systemic challenge that requires evidence-based education and an interdisciplinary team to raise awareness, shift individual behaviors, and improve patient outcomes (Lopez-Jeng & Eberth, 2019). This scholarly project aimed to develop a fall prevention program and educational resource for the interdisciplinary team working in rural hospital settings and to give recommendations on enhancing communication and collaboration among team members. A literature review needs assessment identified the interdisciplinary team's overall needs and guided the development of a fall prevention program specific to the rural hospital setting. The author was permitted to collaborate with the interdisciplinary team at a Critical Access Hospital to develop an educational fall prevention product tailored to the needs of the setting. The ecology of the human performance model was used throughout the literature review, needs assessment, and product development to provide a structural framework for analyzing and interpreting findings (Dunn, 2017). An educational guide with supplemental handouts was created, distributed, and presented to the department heads of occupational therapy, physical therapy, speech therapy, nursing, and pharmacy. The department heads are expected to provide these materials to members of the healthcare team and host team training sessions using this product as a guide.

Implementation of this product is expected to enhance collaboration among team members, raise awareness of each discipline's distinct role in fall prevention, increase team members' confidence and cohesiveness, and reduce the risk of patients falling in the hospital.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

101. Increasing Success for Children with Sensory Processing Difficulties: Education and Support for Individuals Working with Children in Community Settings

[Alyssia D. Pucel](#) and Dr. Julie Grabanski OTR/L, PHD

Occupational Therapy Graduate Student

Background: Children with sensory processing difficulties often experience performance challenges in community settings due to the abundance of sensory stimuli present and the lack of control the child has over the sensory input they receive (Isamel et al., 2019). Some children need more input than others, while some are easily overstimulated and search for ways to avoid sensory input. Attempting to self-regulate is an innate process, where children naturally try to either gain or reduce the amount of input they are getting, which often results in behaviors that appear to be socially unacceptable (Brown et al., 2019). Individuals who do not know about sensory processing may respond to these behaviors in a way that is unsupportive to the child's sensory needs and overall daily functioning. To advocate for children in natural community contexts, Success with Sensory provides individuals who work with children in schools, daycares, and other settings, with sensory-based education and strategies to provide children with the opportunity to meet their sensory needs and engage in daily activities with minimal difficulty.

Project Description: Success With Sensory is a resource guide developed for staff who work with children in community settings. It is a tool that provides education about sensory systems, sensory processing and its correlations with behavior, and strategies to utilize in each setting. Success with Sensory was designed through a review of literature and needs assessment, collaboration with community agencies, and observation in clinic and community settings for analysis of current knowledge and specific needs of staff and children. The resource was presented to staff in prioritized settings following in-service training. Additional community settings, such as hair salons, dental offices, and others, received sensory-based handouts through brief, informal meetings.

Discussion: Success With Sensory was intended to increase teacher and caregiver awareness about sensory processing and how it relates to behavior and task performance to support children in their natural environments. The resource guide includes education about sensory systems and sensory processing and strategies to implement in the classroom to support children in their daily performance.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

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102. The Effect of Exercise on Gestational Weight Gain and Diabetes Risk in Women of Elevated BMI

Lauren Staton

Physician Assistant Graduate Student

Maternal obesity is a risk factor that may increase the likelihood of adverse outcomes during pregnancy such as excessive weight gain, gestational diabetes, macrosomia, and cesarean delivery. As obesity has become a more prevalent diagnosis, the healthcare field is beginning to see its effects on an abundance of patient profiles, including pregnant women. In the primary care setting, providers are the source of information for patients as to what healthy weight gain during pregnancy looks like. By implementing

recommendations for exercise throughout gestation, excessive weight gain and its associated adverse outcomes may decrease in frequency. This literature review examines the efficacy of prescribed exercise programs on the above-mentioned outcomes. Research databases including PubMed and ClinicalKey were used to find studies looking at the effect of exercise on weight gain and diabetes diagnosis during pregnancy. Inclusion and exclusion criteria were used to further narrow down papers. Results of this study showed that exercise was able to decrease occurrence of excessive weight gain and gestational diabetes diagnosis in women with pre-pregnancy body mass index (BMI) in the overweight and obese categories. Further research may need to be done that evaluates the role of physical activity in addition to nutrition, as both are key components to gaining healthy weight during pregnancy.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

103. Chimeric Antigen Receptor T cell vs Standard of Care Therapy for Treatment of Relapsed or Refractory Diffuse Large B Cell Lymphoma

Jessica D.H. Frenkel, PA-S and Russell Kauffman, MPAS, PA-C

Physician Assistant Graduate Student

Diffuse large B cell lymphoma (DLBCL) is the most common and aggressive subset of non-Hodgkin lymphoma. Approximately 20-50% of patients will either relapse or become refractory to primary chemoimmunotherapy treatment methods and require second line treatment, which consists of aggressive high dose chemotherapy and autologous stem cell transplantation (ASCT). Chimeric antigen T cell receptor (CAR-T) therapy is a novel treatment strategy consisting of autologously derived genetically engineered T cells that has been tested as an alternative method for treatment of aggressive forms of DLBCL. The purpose of this review is to compare the efficacy, safety, and cost effectiveness of standard of care treatment versus CAR-T therapy for utility against relapsed and refractory DLBCL. A systematic literature review was performed which evaluated ten articles identified by specific search criteria. Primary endpoints evaluated include event-free and overall survival, response rates, patient tolerance, and cost. Overall, this review found CAR-T to be superior to standard of care therapy on multiple accounts. Combined data demonstrate a six month increase in event-free survival with CAR-T vs standard of care therapy as well as dramatically increased overall survival. Response rates among patients who received CAR-T were also greatly increased compared to those who received standard of care. Although CAR-T was associated with increased rates of neurological events and cytokine release syndrome that was not observed in standard therapy, the frequency of grade 3 events was similar between treatments. Moreover, patient quality of life scores were higher from those who received CAR-T, suggesting that adverse events alone did not contribute to increased patient distress. Finally, although overall cost of CAR-T exceeded that of standard of care treatment, the incremental survival benefits and quality of life superseded cost alone. Based on these data, the conclusion can be drawn that CAR-T is superior to that of standard of care. Notably, during the writing of this review CAR-T was approved as the preferred second-line treatment method for relapsed or refractory DLBCL.

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104. Effects of Probiotic Supplementation on PCOS Outcomes

Allison M. Stoeffler

Physician Assistant Graduate Student

Polycystic ovarian syndrome (PCOS) is a multifactorial metabolic, endocrinologic, and gynecologic condition affecting up to 5 million women in the United States. It is a disease characterized by oligo- or anovulation, hyperandrogenism, and/or polycystic ovaries. Phenotypic presentation can include irregular menstrual cycles, obesity, hirsutism, insulin resistance, or difficulty conceiving. If untreated, PCOS can result in a sequelae of chronic disease burden. Current standard of care consists of metformin for blood sugar control, oral contraceptives for menstrual regularity, and spironolactone for androgen imbalance, but newer research is identifying gut dysbiosis as a possible contributing etiology to disease development and symptomology. This literature review aims to investigate the effectiveness of probiotic supplement regimens in improving the gut microbiome and subsequent outcomes for patients with PCOS, specifically inflammatory, anthropometric, androgen, and blood sugar markers. A comprehensive literature review was performed using PubMed and Clinical Key databases. A variety of keywords and similar articles were used to identify studies that were further screened for inclusion and exclusion criteria. Studies were excluded if they were systematic reviews, published over 10 years ago, utilized non-human subjects, had poor study design, or looked at conditions outside of PCOS. There were 16 articles that met final criteria and were included in this review. Results showed significant improvement in androgen and inflammatory markers but were inconsistent in anthropometric and blood sugar findings. Further studies with longer duration and increased generalizability are needed to more adequately compare probiotics to standard of care in the treatment of PCOS.

Keywords: PCOS, probiotics, synbiotics, microbiome, testosterone, androgens, anthropometrics, glycemic control

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

105. Premenstrual Dysphoric Disorder/Premenstrual Syndrome Luteal Phase Treatment

Shelby A. Gawarecki

Physician Assistant Graduate Student

Many women suffer from PMS/PMDD symptoms that affect their emotional and physical well-being. This research aimed to compare luteal phase treatment options for PMS/PMDD, such as SSRIs, progesterone, and sepranolone. The research was conducted using electronic search databases PubMed, Embase, CINHAL, Access Medicine, Cochrane Library, and NaProTECHNOLOGY Creighton Model FertilityCare System. Studies used in this research were found using keyword and MESH search terms. Each reviewed study was peer-reviewed, including randomized control trials or a meta-analysis.

Among the treatments analyzed, SSRIs emerged as a consistent primary treatment for symptom alleviation, particularly in addressing cognitive symptoms associated with PMS/PMDD. SSRIs, at this time, are the current mainstay treatment and remain the recommended luteal phase treatment of PMS/PMDD. The studies examining various SSRIs, including citalopram, sertraline, escitalopram, and fluoxetine, examined the efficacy of these medications in relieving mood-related symptoms such as irritability, anxiety, and depression during the luteal phase. The data remains inconclusive when evaluating the efficacy of progesterone treatment in the luteal phase, leading to mixed outcomes based on timing treatment administration as it correlated to the exact timing of a woman's ovulation. Finally, ongoing exploration of allopregnanolone levels and the promising results of sepranolone treatment leads the way to a new understanding of hormonal mechanisms in PMS/PMDD. However, despite promising outcomes, sepranolone remains in trial and is not yet available for clinical use.

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106. Probiotic Therapy for the Treatment and Prevention of Bacterial Vaginosis

Chelsea Scheil

Physician Assistant Graduate Student

Bacterial vaginosis (BV) is a common presenting complaint in healthcare, and patients often experience recurrences at a frustrating rate. The mainstay of current treatment is antibiotic therapy, either via oral or vaginal route. When recurrences occur, stronger antibiotics are often employed. This current method of treatment does not address an underlying component that impacts infection recurrence and rate of recurrence- the patient's baseline vaginal microbiome and the healthy bacteria that support it. To determine the efficacy and safety of probiotic therapy for the treatment of bacterial vaginosis, a literature review was completed using databases PubMed and Embase with key words of vaginal diseases, vaginal infections, vaginitis, vaginal discharge, vaginal microbiome, and probiotics. The results of this literature review confirm that probiotic therapy is safe for the treatment of BV, and more effective than antibiotics alone. There are a variety of different probiotic bacterial strains and concentrations utilized for either monotherapy to treat BV or in conjunction with antibiotic therapy. Of the bacterial strains analyzed, those that were most studied were *L. crispatus* and *L.rhamnosus*. Strains that showed the strongest efficacy regarding reducing recurrence of bacterial vaginosis were *L. rhamnosus*, *L. fermentum*, and *L. planterum*. Both oral route and vaginal route of probiotic treatment were shown to be effective and superior to antibiotic use alone. Vaginal route showed a faster impact on microbiome, but also a faster rate of recurrence than oral probiotic use. This data should urge clinicians to strongly consider the use of probiotics when treating bacterial vaginosis and when faced with patients who experience recurrence of infection. Further research is needed regarding identifying all possible bacterial strains that are beneficial in treating/preventing BV, differing combinations of strains for increasing efficacy, and identifying the necessary concentrations of these strains.

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107. Treatment of Irritable Bowel Syndrome: Tricyclic Antidepressants versus Diet modification and Visceral Manipulation

Alexis Int Veldt

Physician Assistant Graduate Student

Irritable bowel syndrome (IBS) is a disorder of the gut-brain interaction that is a chronic and often debilitating disorder characterized by symptoms of recurrent abdominal pain and disordered defecation, affecting up to 10-12% of adults in North America. The purpose of this study analysis is to compare tricyclic antidepressant (TCA) use to diet modification and visceral manipulation in the treatment of IBS. A literature review was performed using various health science databases such as, PubMed, Google Scholar and ClinicalKey, within a time frame of 20 years. Studies chosen for review were peer reviewed and focused on randomized control trials. Several studies were excluded, as they investigated the use of antispasmodics as well as laxative use and bulking agents. Ten studies met the final criteria. The research shows evidence of reduced IBS symptoms with the use of tricyclic antidepressants, diet modification and visceral manipulation. Diet modification appears to be the most beneficial with the least amount of side effects when compared to TCA use, however, more research needs to be done to evaluate how patients react to reintroduction of foods with elimination diets. Visceral manipulation appears to help with refractory symptoms, but more studies need to be conducted in this area due to the increased usage of this option as a treatment for IBS. Tricyclic antidepressants are currently one of the most effective medications for overall symptom improvement, however, more side effects are seen with this treatment option due to anticholinergic effects of these medications. Due to the multifactorial process of IBS, a combination of treatment options is likely to benefit patients more than a single approach alone, to adequately treat patient symptoms.

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108. Let's move! Benefits of exercise compared to SSRIs (escitalopram) for the management of depression: Research from 2020 and Beyond

Brianna J Droessler-Aschliman, PA-S

Physician Assistant Graduate Student

The purpose of this literature review is to determine the effectiveness of exercise as either monotherapy or in combination with SSRIs (selective serotonin reuptake inhibitors) for the management of major depressive disorder. Studies gathered for this review came from the following databases: PubMed, SpringerLink, Academic Search Ultimate, Academic Search Complete, and CINAHL. Current research completed between the years 2020-2023 that consisted of either clinical trials, RCTs, or meta-analysis were included. A total of eleven studies were reviewed that addressed either the benefits of exercise, SSRIs, or a combination for the management of depression. Upon completion of the literature review, it was determined that exercise can be equivocal to SSRIs and considered a treatment option. While this is a significant finding, the benefits of exercises are more consistent in those that adhere to a program and are more effective if prescribed in combination with SSRIs. While exercise has the potential to be considered as a treatment option for patients with major depressive disorder, it would require providers to have the knowledge and awareness of appropriate exercise modalities and resources available to the patients. It is also vital that providers offer continued support to patients and encourage compliance with their programs to yield optimal outcomes.

Keywords: depression, depressive disorders, antidepressives, escitalopram, exercise, exercise movements/techniques, exercise therapy, running, at-home exercise, Pilates, application-based exercise, antidepressive agents, Lexapro

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109. Efficacy of Vitamin D versus Biological Agents in the Management of Rheumatoid Arthritis

Kayli Day, Russell Kauffman

Physician Assistant Graduate Student

Rheumatoid arthritis (RA) is a chronic inflammatory disease leading to joint destruction. There are several treatment options available to patients, including conventional disease modifying antirheumatic drugs (DMARDs) and biological agents, but their efficacies vary per patient and tote significant adverse effects and cost. There is, however, encouraging evidence to suggest the incorporation of vitamin D in treatment regimens may be a promising option for patients. A comprehensive literature review was conducted using PubMed and CINHAl databases, employing keywords and MeSH terms related to RA treatment options, with the goal to compare efficacy of biological agents and vitamin D in the symptom management and progression of RA. Eleven studies met criteria and were analyzed. These studies evaluated vitamin D, tumor necrosis factors, interleukin inhibitors, B-cell inhibitors, and T-cell inhibitors in the treatment and prevention of RA progression.

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The review highlights the complexity of managing RA and underscores the favorable outcomes observed in symptom management and disease progression by biological agents compared to vitamin D. Although vitamin D demonstrates promise as an adjunctive and potential preventative therapy, further research that includes vitamin D as part of a treatment regimen with biologics is necessary to evaluate its potential and proper use in the treatment of RA. Providers must remain informed about optimal practice recommendations, be amenable to a trial-and-error approach to treatment, and consider combination therapy, with use of DMARDs, biologics, and adjunctive therapies such as vitamin D to best meet the needs of individual patients.

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110. Comparison of Cryopreservation of Ovarian Tissue Versus Cryopreservation of Oocytes in Fertility Preservation

Madison Nitschke, PA-S, Vicki Andvik, MPAS, PA-C, Russel Kauffman, MPAS, PA-C

Physician Assistant Graduate Student

This literature review aims to compare ovarian tissue cryopreservation (OTC) and oocyte cryopreservation as methods for fertility preservation. Electronic health science databases including PubMed, Clinical Key, ScienceDirect, and UpToDate were utilized. Seven articles met the inclusion criteria and were analyzed for this comprehensive review. This review indicates that both oocyte and ovarian tissue cryopreservation can effectively preserve fertility, however, ovarian tissue cryopreservation is deemed most effective for prepubertal girls at high risk of iatrogenic primary ovarian insufficiency (POI), or women who are unable to postpone gonadotoxic treatment. Ovarian tissue cryopreservation offers advantages that oocyte cryopreservation does not, such as multiple spontaneous pregnancies from a single transplant and resumption of ovarian function. Ovarian tissue cryopreservation also does not carry the risks associated with ovarian stimulation and delaying gonadotoxic treatment, unlike oocyte cryopreservation. Despite successful birth rates and low surgical risks associated with ovarian tissue cryopreservation, studies reveal a low utilization rate, with women often considering stored ovarian tissue as a “backup plan”. There is a need for further additional research on ovarian tissue cryopreservation, especially in the younger age groups, as there was limited participation in follow-up studies. Overall, the studies analyzed in this literature review support ovarian tissue cryopreservation as an effective method of fertility preservation but emphasize the importance of further investigation and follow-up studies.

Keywords: ovarian tissue cryopreservation, oocyte cryopreservation, cryopreservation techniques, ovarian tissue transplantation, fertility methods, cryopreservation safety

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111. Patient Outcomes With Tele-Emergency Medicine Services in Rural Areas

Andrea J Rieder, Dr. Jeanie McHugo

Physician Assistant Graduate Student

The purpose of this literature review was to examine patient outcomes with the use of tele-emergency medicine. Tele-emergency medicine serves as a tool to expand the healthcare team in rural facilities by connecting them with specialized providers, typically via video conference call, for assistance in surge or low-staff situations, or for guidance in more complicated cases that rural providers might typically transfer to a larger hospital. A benefit of adopting a tele-emergency medicine service is that it can shorten time to care and reduce the need for transfers, thereby reducing associated costs. The question arises as to whether patient outcomes are improved as well, or if the limitations of technology lead to lower quality of care. For this review, databases such as PubMed and Embase were used to compile current research on the topic. The results of this study suggest that the quality of patient care improves with the use of tele-emergency medicine. This is demonstrated by results showing a decrease in medical errors and positive reviews from medical staff. Discharge status appeared to be affected by using tele-emergency medicine,

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resulting in increased admissions, decreased discharges, and decreased transfers. These results demonstrate that tele-emergency medicine can be a useful tool in improving patient outcomes.

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112. Treating Rheumatoid Arthritis: Immunosuppression versus Stem Cell Therapy

Bailee Blickensderfer, PA-S; Russell Kauffman MPAS, PA-C; Jeanie McHugo PhD, PA-C

Physician Assistant Graduate Student

This literature review seeks to uncover the difference in efficacy and side effect profile between methotrexate monotherapy and mesenchymal stem cell therapy for the treatment of rheumatoid arthritis. Rheumatoid arthritis is a debilitating condition that effects mobility and causes inflammation of cartilage, synovium, and bone. Methotrexate has been the first line of disease modification pharmacology of rheumatoid arthritis for quite some time, but this drug is not effective for all patients, and it is commonly the direct cause of many unpleasant side effects. This has led to the search for alternative disease modulation. Through this search, mesenchymal stem cell treatment has emerged as a viable alternative for those affected by rheumatoid arthritis. Eleven scholarly articles were evaluated for the purpose of this literature review. All evaluated material was published after 2017. These articles included primary clinical trials, meta-analysis, in vitro studies, and animal model studies. Data compiled from these studies supports the use of mesenchymal stem cells as treatment for rheumatoid arthritis due to immunomodulatory effect on multiple immune components that contribute to the development of rheumatoid arthritis. Mesenchymal stem cell treatment was also less likely to cause serious side effects than methotrexate therapy. However, the determination of whether mesenchymal stem cell therapy is definitively more effective than methotrexate monotherapy cannot be made. This is largely due to a lack of robust research available for the evaluation of mesenchymal stem cell therapy on rheumatoid arthritis. Additionally, the exact mechanism by which mesenchymal stem cells provide the desired immunomodulatory effects is not yet well understood.

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113. The Efficacy of Probiotic Use in Patients with Anxiety and Depression

JoAnna McClelland, PA-S, Jay Metzger, PhD

Physician Assistant Graduate Student

Given the impact of mental health disorders such as anxiety and depression, it is helpful to know the available resources and treatment options to offer patients to aid in the modulation of symptoms. The gut-brain connection has become more widely researched for its impacts on anxiety and depression. This bodes the question that if the gut microbiome can be altered, would there be a decrease in symptoms of anxiety and depression as a result? One way to alter gut microbiome is to implement a probiotic. To determine if this is an effective treatment option for anxiety and depression, a literature review was conducted using

primarily randomized clinical trials. PubMed was the primary database that was used for this research. Articles were sorted and chosen based upon applicability to the problem being investigated, clinical trials, and a recent time frame of five years. Most of the articles reviewed found statistically significant differences in improvements of symptoms of anxiety and depression in the intervention group participants. Therefore, the results of this literature review suggest that implementing a probiotic either as sole therapy or adjuvant therapy can improve symptoms and severity of anxiety and depression. Probiotics are easily accessible as over-the-counter supplements. This provides an alternative treatment option or adjuvant option to antidepressants that are frequently available to patients.

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114. Lifestyle Changes and Medication Vs. Medication Alone: Symptom Control of Parkinson Disease

Rachel Duncan, Julie Solberg

Physician Assistant Graduate Student

Purpose: Parkinson disease is multifactorial and predominantly effects the geriatric population. The mainstay of treatment for patients diagnosed is currently symptomatic treatment with dopamine replacement. The goal of this literature review is to identify possible lifestyle modifications that can delay progression of the disease or help prolong OFF time of symptoms

Method: A literature review was conducted using electronic search database including, PubMed, Clinical Key and DynaMed. Key terms used in online search included Parkinson disease, MIND diet, Mediterranean diet, DASH diet, Levodopa, dopamine agonists, monoamine oxidase B inhibitors, ropinirole.

Results: Lifestyle modifications to follow the MIND or Mediterranean diet have some benefit in reducing prodrome symptoms as well as slowing progression of the disease. Physical activity showed to delay onset of prodrome symptoms as well as delayed mortality. These modifications also have a relation to efficacy of medications. The use of extended-release levodopa has improved benefits in OFF time of symptoms when compared to immediate release. The addition of ropinirole in medication regimen can reduce the dosage of levodopa needed to control symptoms in addition to prolonged OFF time of parkinsonism symptoms.

Conclusions: After thorough review of 12 articles regarding management of Parkinson disease with various modifications along with medications it was found lifestyle modifications are not significant in the management of Parkinson disease alone. However, there is evidence to support the benefits lifestyle modifications can have, including diet and physical activity, for those diagnosed with Parkinson disease. The addition of these changes have shown the possibility of reducing the OFF time in the disease as well as reducing the daily medication regimen needed.

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115. Monoclonal Antibodies vs. Symptomatic Treatment of Hospitalized Patients with COVID-19

Robert White, PA-S, Vicki Andvik, MPAS, PA-C, Russell Kauffman, MPAS, PA-C

Physician Assistant Graduate Student

The SARS-CoV-2 virus, or COVID-19, was the virus responsible for the worldwide pandemic declared in March 2020. Individuals can experience a wide variety of symptoms ranging from fever, fatigue, cough, and, in more severe cases, hypoxia requiring invasive mechanical ventilation (IMV). Until recently, symptomatic care was the protocol for patients infected with COVID-19. The use of oxygen for mild hypoxia and antipyretics for fevers was considered the standard of care (SOC). The use of antiviral medications, such as monoclonal antibodies, has been proposed in the treatment of acute COVID-19 infection. The purpose of this literature review is to determine if monoclonal antibodies could be considered as treatment options for high-risk patients hospitalized with COVID-19. A literature review was performed on PubMed

using the following MESH terms: COVID-19, monoclonal antibodies, and hospitalization. Articles from 2020 to the present were included in the search. Studies were limited to randomized control trials and clinical trials. Out of 97 total search results, 20 articles were relevant to the search. 10 articles were removed due to the studies being performed as outpatient procedures. Two studies were removed as they were reviews. There are three common goals throughout the studies analyzed in this literature review regarding the use of monoclonal antibodies in patients with COVID-19. The first goal is to decrease the length of hospital admission, the second is to decrease the severity of symptoms, shown by a decrease in inflammatory markers, that may be lethal to more fragile patients, and the third is to reduce the overall mortality of COVID-19. The literature review showed monoclonal antibodies are beneficial when their mechanism of action causes direct inhibition of the inflammatory pathway. Monoclonal antibodies significantly decreased

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inflammatory markers, decreased the average length of hospital admissions, and decreased overall mortality when compared to standard of care treatments. Since there were minimal adverse events recorded throughout the trials, there is a possibility monoclonal antibody infusions could be performed as an outpatient procedure by a qualified medical professional.

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154. SSRI/SNRI medications vs. Cognitive behavioral therapy in the treatment and management of postpartum anxiety

Kelsey Sederquest PA-S, Mindy Staveteig MMS, PA-C

Physician Assistant Graduate Student

The purpose of this literature review is to determine the effects of cognitive behavioral therapy (CBT) and Selective Serotonin Reuptake Inhibitors/Selective Norepinephrine Reuptake Inhibitors (SSRI/SNRI) in women suffering from postpartum anxiety. Efficacy of non-pharmacological, pharmacological, and combination therapy compared within this review. Lastly, prophylactic treatment of anxiety was examined in women who were pregnant or who were newly postpartum without diagnosis of anxiety. In this review the database PubMed was utilized to conduct research that included many different keywords. The articles included were limited to within the last 30 years, and research was narrowed by limiting patient population to postpartum women and eliminating articles that did not evaluate CBT or SSRI/SNRI medication as a form of treatment for anxiety during the postpartum period. The data presented shows evidence that CBT and SSRI/SNRI pharmacological treatment are effective in the treatment of postpartum anxiety, with indication that CBT is more effective in the short term, while pharmacological treatment may be more beneficial for patients needing long term treatment. Analysis of literature did not show any evidence suggesting statistically more significant reduction or remission of symptoms when combining non-pharmacological and pharmacological treatments. Further research should be conducted to explore potential benefits of prophylactic treatment in the antepartum period for postpartum anxiety. Conclusions of literature review conclude that both CBT and pharmacological management of anxiety in postpartum women are both efficacious in remitting and reducing symptoms of anxiety. Significance of these findings point towards clinical improvement in screening and detection of postpartum mental illness with increased use of CBT and/or SSRI/SNRI medications as first line therapy for treatment.

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116. Factors Associated with Hospitalization for Cerebrovascular Accidents in US Emergency Departments

Adam J. Swanson, Christopher R. Brown, Abe E. Sahmoun, and James R. Beal

Medical Student

Purpose: Cerebrovascular accidents (CVAs) are among the leading causes of global morbidity, mortality, and healthcare expenditures. Several lines of evidence suggest that patient outcomes may be dependent on the geographical location of care, regional demographics, and resource availability. The purpose of this study was to identify the major patient and clinical characteristics associated with an inpatient level of care for adults diagnosed with a CVA in the emergency department (ED).

Methods: A retrospective analysis of adult patients aged >18 years presenting to the ED for CVAs was conducted using the 2012-21 National Hospital Ambulatory Care Survey Emergency Department (NHAMCS-ED) datasets. These datasets revealed demographic, clinical, and management factors that were associated with hospitalization for adults diagnosed with a CVA in the ED.

Results: From 2012-2021, there were approximately 6,879,920 CVA cases diagnosed in United States (US) EDs with 4,360,523 (63.4 ± 3.0%) of these hospitalized for an average length of 5.42 days (95% CI 4.60-6.24). The major factors associated with hospitalization included ambulance delivery (p < 0.001) to a metropolitan ED (MSA) (p < 0.001), with an immediate/emergent triage categorization (p < 0.001).

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The vast majority of presenting CVAs were ischemic ($82.9 \pm 1.7\%$); however, there was no difference in hospitalization rates when compared with hemorrhagic stroke ($p = 0.892$). The non-modifiable characteristics of race (white vs minority; $p = 0.522$), sex (male vs female; $p = 0.491$), and region of care ($p = 0.775$) demonstrated no difference in hospitalization rates. Additionally, the blood pressure (BP) upon ED presentation had no correlation with hospitalization rates ($p = 0.556$).

Conclusions: Unsurprisingly, the major factors associated with admission for inpatient management of CVA were transportation to a MSA by ambulance with an immediate/emergent triage categorization. The major comorbidities associated with hospital admission included pre-existing cardiovascular disease, hyperlipidemia, and hypertension, but to our surprise did not include presenting BP. Further analysis is necessary to differentiate these characteristics when considering anatomical location, severity, and clinical findings of the CVA and whether patients who presented initially at a non-MSA were relocated to a MSA for more severe cases.

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117. Association between Food Insecurity and Rural/Urban Residence among Children in the United States

Brenna Hanson, B.S., Ethlyn Voorhies, B.S., James R Beal, Ph.D., Abe E Sahmoun, Ph.D.

Medical Student

Purpose: Due to the increased risk for health conditions that children from low food security homes face, identifying their key demographics and urban-rural residency is important for future endeavors to better the overall health of our community. The purpose of this study was to determine the association between urban-rural residence and food insecurity among children in the United States.

Method: A cross-sectional analysis was performed of children, 2-17 years old, using the 2021 National Health Interview Survey-Child. We compared the level of food insecurity between children living in rural and urban areas. We classified food security levels as food security (high food security and marginal food security) and food insecurity (low food security and very low food security). Rural was defined as nonmetropolitan counties (Micropolitan/Noncore), and Urban as metropolitan counties (Large central metro, Large fringe metro, Medium metro, and Small metro). SAS 9.4 was used to account for the complex sample survey design. Chi-square tests with all significance tests being two-sided, and P-value $\leq .05$ significant.

Results: Of the estimated 7.1 million children in our study, 10.5% had food insecurity. Children in rural areas accounted for 13.1%. Rural children were more likely to be white (81.6% vs. 69.8%, $P=.002$), have a parent without a college degree (49.9% vs. 38.6%, $P=.000$), and be a U.S. citizen (99.2% vs. 96.8%, $P=.002$). There was no association between location and age ($P=.461$), gender ($P=.867$), marital status ($P=.247$), social support ($P=.203$), health insurance ($P=.095$), personal doctor ($P=.525$), usual place of care ($P=.639$).

Additionally, children in rural areas were more likely to be in a family with 3+ children (44.9% vs. 38.7%, $P=.001$), have income not from wages (9.7% vs. 5.8%, $P=.000$), receive food stamps (29.2% vs. 22.6%, $P=.006$), and free/reduced meals (67.1% vs. 58.4%, $P=.002$). The rate of food insecurity was similar in rural and urban areas (12.9% vs. 10.1%, $P=.057$). There was no association between location and receiving WIC benefits in the past 12 months ($P=.296$).

Conclusions: Our research shows 10.5% of U.S. children live with food insecurity. The rate of food insecurity was similar for rural and urban children. However, rural children had higher rates of participation in government funded programs like free lunch and food stamps, indicating that these government funded programs may be fundamental in reducing food insecurity in our youth

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Poster Session 1 Abstracts

118. Acquired Ventricular Septal Defect Secondary to Bacterial Aortic Valve Endocarditis

Courtney Hanson, B.S., Maria Tibesar, B.S., Timothy Pansegrau, M.D.

Medical Student

Introduction: Infective endocarditis remains a deadly disease with an in-hospital mortality rate of around 20%. While ventricular septal defects (VSDs) have been linked to an increased risk of infective endocarditis, cases of acquired VSDs resulting from infective endocarditis are not well-documented in the literature. Our report highlights a rare case of acquired VSD that resulted directly from aortic valve endocarditis.

Presentation: A 57-year-old male presented to an outside hospital with chest pain, shortness of breath, night sweats, fevers, and nausea for the past 7 days. During the physical examination, the physician noted a heart murmur over the left sternal border. Additionally, poor dentition was noted. Laboratory data indicated the patient met criteria for SIRS. Blood cultures detected gram-positive staphylococci and streptococcus anginosus. Due to concern for endocarditis, an order was placed for both a transthoracic echocardiogram (TTE) and transesophageal echocardiogram (TEE). Results showed aortic regurgitation, stenosis, and a mobile growth. The patient was managed with IV antibiotics until transferred.

Upon arrival at our facility, TEE revealed a mobile vegetation, along with a VSD that demonstrated left-to-right flow into the right ventricle. Due to the risk of cardiac decompensation and septic embolization, immediate surgical intervention was necessary. The aorta was opened, and the diseased aortic valve was excised. The necrotic septum was debrided and an acquired VSD the size of a quarter was identified. A pericardial patch was used to repair the VSD. Following debridement a mechanical aortic valve was placed. The patient was taken to ICU in a stable condition. However, several days following the procedure, the patient developed ongoing arrhythmia, and a permanent pacemaker was placed.

Discussion: It has been well-documented in literature that congenital VSDs are associated with an increased incidence of endocarditis. However, only a few cases have been documented where a VSD results directly from aortic valve endocarditis. This is the first recorded case of an adult in the U.S. with native aortic valve gram-positive staphylococci and streptococcus anginosus endocarditis resulting in a large acquired VSD. The condition was successfully diagnosed and treated with surgery. Successful treatment of post-operative arrhythmia with permanent pacemaker placement was achieved- a first for acquired VSD caused by infectious endocarditis.

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Poster Session 2 Abstracts

Traditional Posters

2. Dietary Reversal and/or Exercise Correct Peripheral Neuropathy in Diet-Induced Obesity Mouse Model

Kai Guo, Stephanie Eid, Eva Feldman, Junguk Hur

Visiting Scholar

The prevalence of obesity, prediabetes, and type 2 diabetes is increasing, accompanied by a rise in diabetic complications such as peripheral neuropathy (PN). New clinical guidelines recommend diet and exercise for PN, but optimal regimens and efficacy studies are lacking. Therefore, we aim to assess the effectiveness of diet and exercise, alone or in combination, in a high-fat diet (HFD)-fed mouse model representing obesity, prediabetes, and PN. Our study had five groups: (1) standard diet (SD), (2) HFD, (3) dietary reversal (DR) from HFD to SD, (4) HFD with running wheel exercise (EX), and (5) with dietary reversal and exercise (DR-EX). Interventions began at 18 weeks and lasted for 8 weeks. DR and DR-EX restored the metabolic and neuropathy phenotypes, while EX alone only improved PN. Single-cell RNA-sequencing in sciatic nerves identified seven major cell types, including Schwann cells (SCs), smooth muscle cells, fibroblasts, pericytes, perineurial cells, macrophages, and endothelial cells. Notably, 30 genes were found to be consistently significantly differentially expressed in the three treatment groups compared to HFD in myelinating Schwann cells (mySC). Functional enrichment analysis showed that the perturbation in the PI3K-Akt signaling pathway and ECM-receptor interaction significantly enriched the mySC of SD, DR, and EX when compared to HFD. A few ligand-receptor pathways were substantially more active in the HFD than in other groups. Overall, both DR and EX have positive effects that go beyond enhancing overall metabolic health, which might be directly linked to the nerve environment and the coupling of nerve function with metabolism.

4. Transcriptomics analysis with various tofacitinib dose treatments of amyotrophic lateral sclerosis mice

Fang Huang, Kai Guo, Lillia Baird, Eva Feldman, Stephen, Goutman, Murdock Ben and Junguk Hur

Visiting Scholar

Amyotrophic lateral sclerosis (ALS) is a progressive neurodegenerative disease affecting motor neurons, with an average lifespan of 2-5 years after diagnosis. Given the lack of effective therapies and growing understanding of the potential role of immunomodulatory drugs in ALS, there is a critical need to expand our knowledge in this area. Here, we assessed the effects of high and low doses of tofacitinib, a Janus kinase (JAK) inhibitor, on disease progression in SOD1G93A mice with prevention (treatment before symptom onset) or via a continuous intervention and cycle treatment (repeating the cycle of one-week treatment and one-week). Low-dose treatment significantly extended mice's lifespan with continuous and cycle regimens. Then, the RNA-seq was performed with the whole spinal cord, and the differentially expressed genes (DEG) were identified between ALS mice and treatment groups. We found that there were strong batch effects among different cohorts. With batch correction, we found 154 DEG between the intervention and ALS group and 95 DEGs between the cycle treatment and ALS group. Among the 95 DEGs, 54 genes were also identified as the DEGs between the ALS and wild-type groups. 32 DEGs showed a reverse direction between cycle treatment vs. ALS and ALS vs. WT groups. Pathways enrichment analysis with these 32 DEGs showed that the "PI3K-Akt signaling pathway", "ECM-receptor interaction," and "Axon guidance" were significantly enriched, suggesting that the cycle treatment may prevent disease progression by dysregulating these pathways. In summary, the study provides potential therapy for treating and preventing ALS.

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6. Identifying Drug-Drug Interactions from Biomedical Texts Using Large Language Models

Hasin Rehana, Jie Zheng, Yongqun Oliver He, and Junguk Hur

Research Assistant

The phenomenon known as drug-drug interaction (DDI) occurs when the concurrent ingestion of one medication alters its pharmacological effect. With adverse drug reactions accounting for nearly 0.3 million deaths annually across the United States and Europe, the accurate identification and understanding of DDIs are critical for safeguarding public health. However, manual curation of DDI information from biomedical literature is time-consuming. The exponential growth in published research and clinical findings further compounds the challenge, making it increasingly difficult for healthcare professionals and researchers to stay up to date with the latest DDI knowledge. This situation highlights the essential need for automated solutions capable of fast and accurate extraction of DDI information. This study assesses the efficacy of large language models, specifically BioBERT, PubMedBERT, BioM-BERT, BioM-ALBERT, BioClinicalBERT, SciBERT, GPT-3.5, and GPT-4 models, for extracting DDI from biomedical text. Our results indicate that PubMedBERT leads in performance on the DrugBank subset, achieving a precision of 79.94%, a recall of 81.68%, and an F1 score of 80.80%. On the MedLine subset, BioMBERT demonstrates superior performance with a precision of 75%, recall of 65.62%, and an F1 score of 70%. GPT-4 exhibits the highest recall rates, with 83.9% for the MedLine subset and 84.88% for the DrugBank subset, underscoring its potential in recall-oriented DDI detection tasks. The experimental results of our research highlight the increasing importance and promise of large language models in analyzing biological material and identifying DDI.

8. Characterization of A β and phosphorylated tau changes across the gut-brain axis of AD and control individuals

Chandrasekaran S, Floden AM, and Combs CK.

Post-Doctoral Fellow

Alzheimer's disease (AD) is characterized by the buildup of amyloid- β (A β) peptide plaques and phosphorylated tau (p-tau) neurofibrillary tangles in the brain. However, we and others have shown that the gastrointestinal (GI) tract can also produce A β and p-tau suggesting that the disease is not limited to the central nervous system. Moreover, administration of various types of protein aggregates into the GI tract of mice induces pathology in the brain suggesting that a communication mechanism exists that may allow A β /tau to spread from intestine to the brain. However, these findings have not been validated in humans and the mechanism(s) of transport are unknown. Since the vagus nerve is well characterized to mediate brain-intestine interaction, we hypothesized that A β /tau can use this nerve to move between organs. To test this idea, we quantified possible translocation of A β /p-tau between the brain and intestine in the same individuals. Temporal cortex (TC), medulla, vagus, and colon sections (5-6 μ m) [male cognitively normal control (n=9) and AD subjects (n=7), (65-99 y/o), Banner Sun Health Research Institute] were immunostained to detect A β /p-tau (AT8-pSer202/pThr205; PHF-1-pSer396/404). The stains were visually scored from 0-3 (0-none;1-sparse;2-moderate;3-frequent immunoreactivity) by observers (n=3) blinded to the groups. As expected, the AD TC had significantly increased positive staining for A β when compared to controls. This difference was also observed in the medulla, absent in the vagus, and apparent again in the colons when compared to control individuals. These findings confirmed that A β pathology occurs in both the brains and intestines during disease but likely does not communicate between organs via the vagus. Regarding p-tau pathology, AD TC and medulla showed increased AT8, and PHF-1 immunoreactivity compared to controls whereas the vagus and colons from control and AD patients did not show AT8 positivity. Interestingly, PHF-1 staining was positive in both the vagus and colon of AD and control individuals suggesting that this particular p-tau form may use the vagus to communicate between the brain and intestine during AD. The consequences of A β and specific p-tau pathology in the colon warrant further investigation to determine whether AD is also a disease of the GI tract. Determining whether specific forms of p-tau transit between the brain and intestine requires further investigation as a novel mechanism of disease.

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10. SARS-CoV-2 Spike reduces Epithelial Cell's Oxygen Consumption Rate

Muhammad Faheem, Jon Mason, Sara Piatz, Yeabtsega Abraham, Masfique Mehedi

Post-Doctoral Fellow

Oxygen consumption rate (OCR) is an essential parameter to assess cellular health. It provides vital information about the cell's viability. To determine OCR of adherent cells, we used Resipher to measure O₂ concentration in the media above the cell monolayer. We determined a temporal OCR from two different epithelial cells (A549 cells and Vero cells) at different densities. We found an increase in OCR by these adherent cells over time due to their growth; however, the overconfluent cell monolayers did not increase OCR over time. We then further analyzed OCR at a single cell level over time and found that an individual cell consumes more oxygen over a period of time. Thus, the OCR of the epithelial cell monolayer depends on the number of cells, each cell's consumption, and the spatial distance among cells. To determine whether SARS-CoV-2 spike-induced mitochondrial dysfunction impacts OCR, we transiently expressed spike in A549 cells and determined OCR up to 72 hours. We found that the spike reduced OCR substantially without any recovery. Thus, Resipher-based real-time monitoring of OCR in cell culture provides an in vitro model to screen drugs to restore spike-induced reduction of mitochondrial function.

12. Prolonged allergen consumption sustains neuroinflammation independent of allergen-specific IgE levels in mice with subclinical food allergy

Geetika Verma, Kumi Nagamoto-Combs

Post-Doctoral Fellow

We have previously demonstrated that consumption of whey-protein (WP) diet for 2 weeks resulted in behavior changes and neuroinflammation in male C57BL/6J mice that had been sub-clinically sensitized to a bovine whey allergen, β -lactoglobulin (BLG, Bos d 5). To further examine whether allergen avoidance would attenuate peripheral and central inflammation in this unique mouse model of cow's milk allergy, we assessed the immune responses in their blood and brain without or with the cessation of allergen consumption. Following the 2-week WP diet, sham- and BLG-sensitized mice (male and female) were subsequently given either a WP-free control (CTL) or WP-containing diet for an additional 2 weeks as a recovery period. Plasma samples were taken every week after sensitization until the end of the experiment and subjected to ELISA. Interestingly, significant decreases in allergen-specific IgE and histamine levels were observed in the plasma of BLG-sensitized males that stayed on the WP diet during the recovery period, indicating desensitization. In contrast, the BLG-specific IgG1 levels remained elevated with the WP diet in sensitized mice, while allergen avoidance lowered the antibody levels. BLG-sensitized mice that stayed on the WP diet throughout the recovery period also showed behavior changes assessed by open field activity test. Further, immunohistochemistry showed significant increase in astrogliosis in the brain of BLG-sensitized mice that remain on WP diet throughout the recovery period. These results indicated that continuously consuming offending allergens sustained neuroinflammation even after plasma IgE levels had declined, suggesting the importance of allergen avoidance in allergen-tolerant individuals.

14. A novel drug-Like small molecule FAK activator poses epithelial skin healing possibilities.

Odele Rajpathy, Maggie Dervis, Emily Lygre, Emilie Vomhof-DeKrey

Undergraduate

Introduction: The activation of focal adhesion kinase (FAK) at tyrosine 397 (pFAK Y397) plays a crucial role in cell migration and wound healing. Previous studies have shown that M64HCl, a small molecule activator of FAK, enhances wound healing in Caco2 intestinal cells. However, it remains unclear whether M64HCl can similarly activate pFAK Y397 and promote wound healing in HEKa keratinocytes. Activation

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of pFAK Y397 in HEKa keratinocytes holds promise for enhancing wound healing, particularly in diabetic ulcers where impaired cell migration is a significant challenge.

We hypothesized that treatment with M64HCl would lead to activation of pFAK Y397 and enhance wound healing in HEKa keratinocytes.

Methods: HEKa keratinocytes were cultured and treated with M64HCl or water vehicle control. The protein activation status of pFAK Y397 was analyzed using Western blot and compared to Total FAK protein levels. Scratch wound assays were performed to assess the effect of M64HCl treatment on HEKa cell sheet migration. Cells from different passages and frozen stocks were used to evaluate the consistency of the observed effects.

Results: Confirmation experiments revealed that M64HCl treatment led to a trending activation increase in pFAK Y397 in HEKa keratinocytes, similar to Caco2 intestinal cells. Wound healing assays demonstrated that the effect of M64HCl on cell migration varied depending on the differentiation state of HEKa cells and the passage/frozen stock used. Specifically, at passage 3, M64HCl treatment resulted in higher wound healing compared to control cells. However, at passage 5, the effect of M64HCl on wound healing was inconsistent, with some samples showing slightly higher wound healing and others showing lower wound healing compared to controls.

Conclusions: The observed variability in the effect of M64HCl on wound healing in HEKa keratinocytes highlights the need for further investigation and optimization of treatment protocols. To address these inconsistencies, future studies should focus on optimizing passage and frozen stock selection, standardizing cell density and cell culture conditions, and exploring additional assays to evaluate cell migration. Additionally, investigating the impact of cell differentiation status and exploring combination therapies with other wound healing agents may provide valuable insights into enhancing the efficacy of M64HCl in promoting wound healing, and further clinical application to diabetic ulcer healing.

16. Differential Palmitoylation Between the *Drosophila* Dopamine Transporter and its Mammalian Homologs

Evan T. Halvorson, Madhur Shetty, Alexandria Smith, Hailey Rosenfeld, Lauren Flake, Madison Larson, Evan Walter, Mason Curtis, L. Keith Henry, and James D. Foster

Undergraduate

Dopamine (DA) is a neurotransmitter produced in the brain that plays a key role in movement, reward, motivation, mood, and concentration. Dysregulation of DA levels is associated with the development of certain illnesses, such as depression, schizophrenia, attention-deficit hyperactivity disorder, addiction, and Parkinson's Disease. DA levels in the brain are primarily controlled by the action of dopamine transporters (DATs) where released DA is transported back into presynaptic neurons for storage in synaptic vesicles. DAT is primarily regulated through posttranslational modifications such as ubiquitylation, phosphorylation, and palmitoylation which control transport kinetics, surface expression, and degradation of the transporter. Palmitoylation, a reversible lipid modification occurring on intracellular cysteines (cys), increases DAT transport capacity and opposes DAT degradation making this modification an important regulator of DAT function. *Drosophila* are frequently used as a model system for studying human disease processes due to the relative ease of laboratory culture and genetic modification of the organism. However, examination of the *Drosophila* DAT (dDAT) protein sequence indicates the absence of intracellularly accessible cys residues available for palmitoylation, unlike its mammalian homologs. We hypothesized that the WT dDAT is not palmitoylated as we have previously demonstrated in rat (rDAT) and human (hDAT) transporters. To test our hypothesis, we utilized LLC-PK1 cells expressing dDAT, or rDAT as a control, and assessed palmitoylation using an acyl-biotinyl exchange (ABE) assay, followed by SDS-PAGE and immunoblotting. We found that dDAT is not palmitoylated suggesting that the regulation of dDAT may be significantly different than its mammalian homologs. In addition, we generated Human Embryonic Kidney (HEK) cell lines expressing the dDAT mutants L580C and In12C mimicking the known and predicted palmitoylation sites in mammalian DATs. Following the same experimental methodology, we found that when a cys residue is introduced at position 580 of the dDAT protein sequence, palmitoylation is recovered, in agreement with this site being a major site of palmitoylation in mammalian DATs. However,

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when a cys residue is inserted at position 12 following the SKSK motif, palmitoylation was not recovered, potentially due to the dDAT N-terminus being shorter than that found in mammalian DATs.

18. Regional effect of a milk allergen on intestinal mucin levels in a mouse model of subclinical food allergy

Christine Stayman, Dilini Ekanayake, Kumi Nagamoto-Combs

Undergraduate

Purpose: Subclinical, non-life-threatening hypersensitivities to foods do not necessarily discourage individuals from consuming the offending food, placing them at a greater risk of intestinal inflammation and dysbiosis that may compromise the epithelial barrier. Hypothesizing that the mucus layer would be impaired via reduced mucin production in response to continuous exposure to offending food allergens, we investigated mucin levels across the length of the small intestine in mice that had been subclinically sensitized to a cow's milk allergen, β -lactoglobulin (BLG, Bos d 5).

Method: Male C57BL/6J mice were orally sensitized to BLG and subsequently placed on a whey-protein-containing diet for 2 weeks. Naïve and sham-sensitized mice were used as controls. The entire lengths of the small intestines were dissected, and "Swiss rolls" were prepared for histological analysis. Alcian blue staining was used to visualize the acidic mucin within the small intestine. The histological images were processed using Fiji ImageJ software to determine the areas of mucin staining and the total intestinal tissue. The area of mucin staining was normalized to the intestinal tissue area.

Results: Mucin levels in the proximal and intermediate regions of the small intestine showed no significant changes across all treatment groups. In contrast, a notable increase in mucin levels was observed in the distal region of the small intestine of the BLG-treated group compared to naïve and sham groups. These results indicated that allergen exposure differentially affected the mucus levels in the small intestine by region.

Conclusions: Allergen consumption significantly increased the mucin levels within the distal small intestine of subclinically sensitized mice, suggesting alterations in intestinal physiology. These findings highlighted the potential impact of dietary allergens on mucin dynamics, a critical component for maintaining epithelial barrier integrity.

20. Determining Respiratory syncytial virus-induced epigenetic modulation in the lung

Cassidy Davidson, Goshen David Miteu, Muhammad Faheem, and Masfique Mehedi

Undergraduate

Respiratory syncytial virus (RSV) causes a lower respiratory tract illness in children and adults. RSV infection associated asthma still needs to be explored. This association can be studied through exploration of epigenetics modulation. We hypothesize that chromatin remodeling in infected RSV cells leads to stable asthma progression. We are studying this hypothesis via infection of primary donor epithelial cells of healthy adults, healthy pediatrics, and adults with asthma. The protocol adapted for this study is assay for transposase-accessible next-generation sequencing (ATAC-seq), which is used to determine the chromatin remodeling of DNA that will be sequenced to determine gene alteration. Once the altered regulated genes are determined, we will be able to determine correlations of RSV genetic regulation in normal and asthmatic cells. These findings can lead to new treatments to help protect children and adults from RSV-driven asthma.

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22. Exploring Postpartum Care: A Guide for Mothers

Amber Matlock, OTDS, Julie Grabanski, PhD., OTR/L, Kayla Korynta, OTR/L

Occupational Therapy Graduate Student

Background: Thousands of babies are born in hospitals each year. Before being discharged home from the hospital, mothers receive education from interprofessional team members about their infant's care, but there is a lack of information and education provided to mothers about their care and postpartum recovery. Without having adequate information on a mother's recovery, there is an increased risk for poor maternal outcomes to occur during the postpartum journey. Maternal health is an emerging practice area for occupational therapy practitioners; the population is within the scope of practice for the profession. Currently, there is limited literature on the role of occupational therapy within maternal health and postpartum care, despite the benefits of including occupational therapy as an interprofessional team member.

Project Description: To address the lack of education provided to mothers in the healthcare system, an educational guide, Exploring Postpartum Care: A Guide for Mothers, was created. The education guide was created using the Ecology of Human Performance model to guide the organization. The information in the guide included the following topics: mental health, pelvic floor health, safe body mechanics, pain management, routines, roles, breastfeeding, nutrition, self-care, social supports, supplies, healing timeline, precautions, signs of complications, and resources.

Discussion: Exploring Postpartum Care: A Guide for Mothers was created from an occupational therapy perspective to assist mothers with their transition into the postpartum journey. The goal of this guide was to provide a more holistic approach to a mother's postpartum journey to improve their knowledge about the postpartum experience and their maternal outcomes. Exploring Postpartum Care: A Guide for Mothers was provided to a Midwest Healthcare System where it will be distributed to all mothers as part of their education resources at discharge. Additionally, this project contributed to the field of occupational therapy by providing occupational therapy practitioners with a starting point of information to be addressed in a session with a patient while the role of occupational therapy in maternal health expands.

24. It's "goni" be okay: A guide to developing your occupational therapy career within the athletic population.

Grace Kleinvachter, Dr. Mandy Meyer, Ashley Cardinal

Occupational Therapy Graduate Student

Background: With around 30 million people participating in athletics each year, injury prevention, management, and treatment are a necessity with the inevitability of injuries (Host & Mankie, 2018). Occupational therapy (OT) is a versatile profession that has the scope of practice to provide many different types of treatment as well as education to athletes and their supporters (Host & Mankie, 2018). In general, OT as a whole has previously overlooked how the profession can be of use to a population such as athletes who are more commonly seen in the sports medicine setting by physical therapists and athletic trainers (Host & Mankie, 2018). To address this, a guide was developed for occupational therapists and/or other sports medicine professionals; this guide contains information on the athletic rehabilitation setting and resources to support OT services within this setting and population specific to a regional facility in Fargo, ND.

Project description: The development of this product/guide was initiated through an in-depth literature review to identify gaps in rehabilitation of injuries of an athletic nature that can be filled by OT, current OT practices through the lens of hand therapy, current diagnoses and intervention methods utilized, current evidence supporting the intervention methods identified, problems that arise when starting an OT job in this setting, and tips for practitioners beginning in this setting. The literature was combined with real-world experiences of current occupational therapists, and the experiences of other sports medicine related professionals. OT specific theories were utilized to guide this scholarly project's formation consisting of the

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Person-Environment-Occupation Model and the Biomechanical Frame of Reference (Baptiste, 2017; McMillian, 2011).

Discussion: The results of the literature review and combined experiences of various professionals were developed into a novel guide for OT professionals looking to begin working with orthopedic and athletic rehabilitation at a hand therapy facility in Fargo, ND. The guide consists of current research trends, advice from various local professionals, and evidence supporting OT involvement with this population. This guide provides accessible information to help improve OT's voice within the sports medicine healthcare population by providing the gateway to common patient encounters, the specifics of OT in this setting, and how to best transition into a job of this nature.

26. ADDRESSING OCCUPATIONAL DEPRIVATION AND ALIENATION IN RURAL SKILLED NURSING FACILITIES THROUGH AN ACTIVITIES RESOURCE GUIDE

Stephanie Dullum

Occupational Therapy Graduate Student

Purpose: The purpose of this product was to collaborate with residents and the activities department in a rural skilled nursing facility (SNF) to create leisure activities to address common chronic conditions and the needs or wants of the residents. With aging comes more chronic conditions and less physical activity, socialization, and time engaged in activities, affecting quality of life (QOL) and well-being (Causey-Upton, 2015; Cudjoe et al., 2020; Nedjeljeko et al., 2021; Portillo et al., 2023; Sen et al., 2022; Smallfield & Molitor, 2018; World Health Organization [WHO], 2022). Providing residents with more meaningful leisure activities will assist the SNF staff in addressing those common concerns through physical, social, creative, and cognitive skills (Cirillo, A., 2022; Senior Services of America, n.d.).

Method: A literature review needs assessment was done to find different ways to address common chronic conditions and occupational deprivation in the adult population residing in SNFs. Various health concerns of the population were analyzed, along with how to address them, increase leisure engagement, and what activities should be utilized in a SNF. The environment-health-occupation-well-being (E-HOW) model was used to guide the literature review needs assessment and develop the product (Pizzi & Richards, 2017). The final product was molded and created while completing a placement in a rural SNF.

Results: The final product is an activity resource guide that provides activities to SNF staff to impact the residents' quality of life and well-being positively. This guide can be used and adapted for rural SNFs or assisted living facilities to provide ideas for activities that may fit the residents' needs and interests.

Conclusion: The evidence-based resource guide was created to assist the activities director and SNF staff members in providing activities that will positively impact the resident's well-being and QOL. The resource guide was created from learning about the residents' interests and comparing those to what the evidence states are the most beneficial activities to address common health disparities seen in the population. This product is intended to enhance the residents' health, well-being, and QOL through activities that address physical, social, creative, and cognitive skills. Future research should look to determine more activities that address all skill and leisure areas that will benefit their overall health.

28. Promoting Physical and Psychosocial Wellness for Individuals with Neurological Impairments

Emmalee Burtfield, Jessa Hulteng

Occupational Therapy Graduate Student

Purpose: Neurological impairments have been identified as the first leading cause of disability across the world and the second leading cause of death globally. There is a substantial financial impact associated with neurological conditions. It is essential to consider how effective use of best therapy practices can help to reduce costs accompanying neurological impairments and promote quality of life amongst patients. The materials in this resource are intended to enhance occupational performance for individuals with neurological impairments by addressing common barriers and psychosocial comorbidities.

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Method: The Model of Human Occupation (MOHO) guided the scholarly project. A detailed review of the literature, assessment of needs, clinical experience in inpatient and outpatient neurorehabilitation settings, and collaboration with interdisciplinary team members determined that individuals with neurological impairment's occupational identity and competence influence occupational performance.

Results: The materials created consisted of resources for understanding neurological diagnoses, physical resources, psychosocial resources, caregiver resources, and environmental resources. These resources addressed the unmet needs of patients with neurological impairments. Resources were disseminated through an online platform titled PromOTe Neurological Wellness. Materials were also provided via hard copy to occupational therapy practitioners at the facility.

Conclusions: This resource was intended to address factors influencing occupational identity and occupational competence for individuals who have neurological impairments. The materials provided can be utilized in various ways to support performance and participation in daily life tasks. With access to these resources, patients will have increased motivation to continue engaging in meaningful occupations.

30. Helping Hands: Self Managing Chronic Upper Extremity Pain

Kaylee M. Athmann

Occupational Therapy Graduate Student

Background: This scholarly project aims to provide education on self-management techniques for chronic upper extremity (UE) pain. There are currently limited resources that properly educate clients on self-management techniques for chronic (UE) pain. Nevertheless, there is a need for a chronic UE pain self-management program because chronic pain affects individuals' performance of all their occupations and has the potential to lead to social limitations, a decline in work ability and productivity and a decrease in quality of life. Furthermore, it is currently the leading cause of disability worldwide. Occupational therapy practitioners who focus on the UE are known as hand therapists and play a role in addressing chronic upper extremity pain.

Project Description: Eight videos were created with a focus on viewing the individual holistically. They address interventions related to both mind and body. The videos use visual demonstration paired with verbal content to educate viewers on strategies they can use to help self-manage their chronic upper extremity pain.

Results: The intended results of the chronic UE pain self-management program is that it will provide a resource for those who may experience a barrier to accessing formal therapy sessions. It is also intended to decrease practitioners' caseloads by providing education on ways clients can self-manage their pain on their own. Lastly, the program is intended to provide education on interventions that focus on the person holistically including mind and body.

Discussion: Occupational therapy practitioners have the knowledge and skill sets to address chronic upper extremity pain but given the prevalence of the condition and the barriers individuals may experience to formal therapy sessions, this program has the potential to be beneficial for both parties. The chronic upper extremity pain self-management program can positively impact an individual's perceived pain levels and ultimately increase their occupational performance and overall quality of life.

32. Poly adenosine diphosphate-ribose polymerase (PARP) Inhibitors versus Traditional Therapy in BRCA positive HER2 Negative Breast Cancer

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Physician Assistant Graduate Student

Of the women diagnosed with breast cancer, approximately 5% will be found to have a germline breast cancer gene mutation (BRCA). This mutation increases the risk for developing a triple negative breast

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cancer, of which treatment options are limited. PARP inhibitors are a new pharmaceutical that act on the PARP enzyme to stop repair for cancer cells in BRCA mutations (Robson et al., 2017). The purpose of this literature review is to compare efficacy and safety of PARP inhibitor pharmaceuticals to traditional therapy for treatment of BRCA positive HER2 negative breast cancers. A literature review was preformed using the electronic search database PubMed. Both keywords and mesh terms were used to define a set of the literature discussing PARP inhibitor safety and effectiveness in patients with BRCA positive HER2 negative breast cancer. Eight phase two or phase three clinical trials that considered BRCA status were selected for the review, and information was sorted based on early, locally advanced, or metastatic breast cancer stage.

Regardless of stage, most clinical trials supported the use of PARP inhibitors for treatment of breast cancer in BRCA positive participants. The one clinical trial that did not show PARP inhibitor benefit did not consider BRCA status for the trial. Most participants tolerated the medication with hematologic deficits, nausea, and vomiting being the most common side effects. This research supports the use of PARP inhibitors in practice. Monitoring blood counts and verifying BRCA mutation with genetic testing would be beneficial.

Keywords: PARP inhibitors, BRCA mutation, early breast cancer, locally advanced breast cancer, metastatic breast cancer, and triple negative breast cancer.

34. Transcranial Direct Current Stimulation (tDCS) to Improve Cognitive Function in Parkinson's Disease

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Clinical Laboratory Science Graduate Student

Purpose: Parkinson's Disease (PD) is the second most common neurological condition and affects roughly one million people in the United States. The non-motor symptoms of PD are often poorly recognized and overshadowed by the motor-symptoms in the treatment plan. Recently, transcranial direct current stimulation (tDCS) has been studied and suggested as a potential treatment for Parkinson patients' non-motor symptoms. The purpose of this study is to investigate the effects tDCS on cognitive function in patients with Parkinson's Disease.

Method: Twenty-four PD patients were randomly assigned to either stimulation (n = 12) or sham (control) group (n = 12). Participants received tDCS stimulation of the left dorsolateral prefrontal cortex (l-DLPFC) at 2mA for 20 minutes on 5 consecutive days (Monday-Friday). All subjects completed a battery of neuropsychological tests at the baseline visit prior to the intervention, a post-test following the last tDCS session, and follow-up visits at one- and two-weeks post-intervention. At each of the test sessions, participants completed the Center for Epidemiologic Studies Depression Scale (CES-D), McGill Quality of Life Part A (QOL), Digit Span, and Stroop. Cognitive function was measured using the Digit Span and Stroop interference scores (standardized T-score).

Results: We found no immediate (1-week) or long-term (3-week) significant improvements in cognitive function after our tDCS intervention ($p > .05$). The Stroop test is approaching significance ($p = .062$), suggesting that with an increased sample size, we may observe a significant benefit of tDCS on selective attention and inhibition.

Conclusion: This is pilot data for a study looking at immediate and long-term effects of tDCS on PD patient's cognitive function. Our findings indicate that tDCS (2mA for 20 minutes for 5 days) does not significantly improve cognitive function in PD, which is contrary to other findings that demonstrated tDCS enhances cognitive function in PD. We aim to continue data collection until we have a total sample of 40. Our results contribute to the literature on tDCS parameters and the limitations of tDCS to improve cognitive function in non-demented PD.

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36. Adverse Childhood Experiences and Utilization of Preventive Healthcare among Children in Rural Communities in the United States (NHIS 2022)

Mary Labuhn, Andrew Williams

Master of Public Health Graduate Student

Purpose: Rural residing children have increased risk for Adverse Childhood Experiences (ACEs) and are less likely to receive preventive healthcare. Additionally, associations between ACEs and health behaviors may be sex specific. Given rural-urban disparities in chronic health conditions, examination of drivers of these disparities is needed. It is hypothesized that among rural residing children in the U.S., those with at least one ACE will have a decreased likelihood of utilizing preventive healthcare.

Method: Data for 425 (weighted n=3,949,102) children (aged 9-17) were drawn from the 2022 National Health Interview Survey. Sample included those identified as residing in “nonmetropolitan” areas according to the 2013 NCHS Urban-Rural Classification. Physician visit in the past 12 months(yes/no), dental visit in the past 12 months(yes/no), COVID-19, flu, and HPV vaccination(yes/no) were self-reported. Participants self-reported(yes/no) to 8 ACEs(high ACEs ≥ 1). Logistic regression estimated odds ratios and 95% confidence intervals for associations between ACEs and each preventive health outcome, adjusted for demographic and healthcare factors.

Results: Children with ≥ 1 ACE were 81% more likely (OR=3.29,95%CI 1.04,3.18) to receive a flu vaccine and 184% (OR=0.52,95%CI 1.66,4.85) more likely to receive an HPV shot compared to children with 0 ACEs. There were no significant associations between ACEs and doctor visit, dental visit, and COVID-19 vaccination. Further, boys had decreased odds (OR=0.34,95%CI 0.13,0.94) of visiting a dentist within 1 year. Girls had increased odds (OR=3.87, 95%CI 1.56,9.60) of receiving an HPV vaccine.

Conclusions: Overall, children with ≥ 1 ACE were more likely to receive a flu shot and HPV shot, yet no association was observed between ACEs and doctor visit, dental visit, or COVID-19 vaccine. We observed sex differences, such that boys with ≥ 1 ACE were significantly less likely to have had a recent dentist visit than girls with ≥ 1 ACE. Also, girls with ≥ 1 ACE were more likely have received an HPV shot than boys with ≥ 1 ACE. Sex-based differences in ACEs may explain observed differences by sex. For example, boys have a higher prevalence of “lacking basic needs” than do girls. Further research is warranted to best inform prevention efforts in rural communities.

38. A Policy Review of Cancer Screening and Treatment for Individuals with Intellectual Disabilities

Claire Wagner MPHc, Amber Lyon-Colbert PhD, MS advisor

Master of Public Health Graduate Student

Background: Individuals with Intellectual and Developmental Disabilities (IDD) are consistently screened for cancers at a lesser rate than the general population and, as a result, cancer is more often underdiagnosed and untreated in people with IDD. From 2006-2010 it was found that Pap testing rates were 85% for the general population of women in the United States. Women with IDD were 72% less likely to have received cervical cancer screening in this period of time. Individuals without IDD have reduced breast cancer death rates by over 40% and are screened biannually at a rate of over 80%, just 17% of women with IDD are screened in the same timeframe. Individuals with IDD are generally less aware of cancer risks and preventative measures available. There are also behavioral and social barriers that arise from the spectrum of IDD that exist within this population. Less than 2 in 10 graduating MDs have any training or experience working with individuals with IDD.

Purpose: The purpose of this policy review is to identify gaps in cancer screening practices for IDD individuals and provide recommendations for policy improvement.

Method: Methods for this project include a literature review of existing policies along with a systematic review of quantitative data for cancer screenings and outcomes in individuals with IDD. The POLARIS method of policy analysis was used to identify policy options and assign recommendations. Steps of the

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POLARIS method are problem identification, policy analysis, strategy and policy development, policy enactment, and policy implementation. We chose POLARIS as it is the best method to consider policy options and systematically evaluate them based on our unique situation.

Results: The results of this review show there is a need for further education about intellectual disabilities along with hands-on training for clinicians to be able to provide adequate care to IDD populations. There is potential to address the IDD population directly to provide training on cancer screening and preventions to teach self-efficacy and allow them to be proactive in their healthcare. Evaluative criteria for these recommendations are based on overall cancer diagnostic and screening rates improvement for individuals with and IDD.

Conclusions: Cancer screenings and treatment in individuals with IDD needs updated policy in the same manner as the general population to increase awareness and prompt treatment resulting in better health outcomes and prognosis.

40. Artificial Intelligence and Predictive Analytics in Medicaid And Medicare: Improved Healthcare Decision-making And Efficiency

Olivia Rajpathy MPHc, Amber Lyon-Colbert PhD, MS

Master of Public Health Graduate Student

Introduction: The use of artificial intelligence (AI) and predictive analytics (PA) are being explored within Centers for Medicaid Services (CMS). This initial utility of AI within the CMS also exposes several gaps in current initiatives and policies including the need for collaborative efforts for AI implementation to facilitate ongoing evaluation for cost-effectiveness and health equity.

Project goal: Complete a policy analysis to evaluate the fair use and adoption of AI and PA within CMS in a responsible, equitable, and efficient way that leads to improved decision-making and health equity for beneficiaries in the US.

Methods: The Center for Disease Control and Prevention POLARIS (Policy Analysis for Local, Regional, and International Settings) methodology framework was used for this policy analysis. This framework was chosen due to its systematic design and approach to help develop policies that could help address public health problems within the community. Based on this framework a systematic five-step process was followed to consolidate the analysis including 1. Problem Identification, 2. Policy Analysis, 3. Strategy and Policy Development, 4. Policy Enactment and 5. Policy Implementation.

Results: Five existing CMS AI policies and initiatives were identified and reviewed. The Fraud Prevention System (FPS) was a first of its kind state of the art predictive analytics technology launched within the CMS in 2011. It was recognized that CMS started exploring the use of AI technology for program integrity purposes prior to 2019, systematically striving to apply advanced analytics within their systems.

Discussion: The alignment of AI coverage criteria with Medicare and Medicaid laws needs additional performance metrics for fairness and equity. Current artificial intelligence policies explored within the CMS are in their nascent stages and lack formal guidance for CMS coverage of artificial intelligence.

Conclusions: Formal regulatory guidance addressing standards for CMS coverage of AI in healthcare delivery is needed to improve population health outcomes, healthcare delivery, fairness and equity, and financial feasibility of implementation respectively within the CMS. Stakeholder collaboration is recommended to design and launch pilot programs to recognize the scalability of AI and PA within CMS, rectify loopholes in existing nascent policies, and develop dynamic foolproof metrics for continuous fair and equitable evaluation.

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119. The WYId Outdoors: A Community-Based Occupational Therapy Program to Address Mental Health Strategies in Rural Wyoming

Emily Ray, Mandy Meyer, Cassandra Bennett

Occupational Therapy Graduate Student

Background: Globally there is an expressed need to address mental health promotion and prevention strategies in community-based settings (World Health Organization [WHO], 2022). To work toward meeting these needs it is important to start at a local level. Statewide initiatives in Wyoming have risen in recent years with goals to expand upon mental and behavioral health, but culture and lack of environmental means significantly impact accessibility to these resources (State of Wyoming [SOW], 2023). Based on literature findings there are even fewer local resources for parents, caregivers, and children to learn strategies to benefit mental health in a community setting (Shermetzler, 2023; National Alliance on Mental Illness [NAMI], 2021; Annie E. Casey Foundation, 2022, SOW, 2023).

Purpose: This scholarly project aimed to devise a community-based program tailored to rural Wyoming, focusing on the promotion of mental health strategies that can in turn prevent future difficulties related to mental health. The program titled The WYId Outdoors is intended to promote the overall health and well-being of group members by promoting positive mental health strategies, accessibility to meaningful occupations, creating a larger sense of community and purpose, as well as fostering resilience in the face of adversity.

Methods: A comprehensive needs assessment and literature review were conducted to identify community needs, available resources, funding opportunities, and evidence-based approaches to support and promote positive mental health alongside the incorporation of meaningful outdoor occupations. To guide the development of this project the Person, Environment, and Occupation model was utilized along with frames of references including cognitive behavioral theory, social learning theory, social cognitive theory, and mindfulness-based cognitive therapy (Baptiste, 2017; Beck, 1976; Bandura, 1985; Bandura 2001, Segal et al., 2002).

Results: The novel program is an eight-session, evidence-based group protocol combining mental health education with participation in area-specific outdoor occupations. The program facilitates the integration of mental health strategies throughout daily life and supports community and family connections to enhance overall health and well-being. The product is intended to be co-led by an occupational therapy practitioner as well as a local community expert. Additionally, it can be adapted for use by interprofessional team members and serve

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120. An Occupational Therapy Approach to Chronic Condition Self-Management

Makayla M. Tucker

Occupational Therapy Graduate Student

Background: Chronic health conditions often lead to decreased engagement in valued occupations, habits, roles, and routines secondary to the effects of the diagnosis (Lorig et al., 2020). This community project aims to explore occupation-based intervention approaches to assist adults in self-managing their chronic conditions. Additionally, the project aims to fill the gap in healthcare to improve healthcare professionals' collaboration to improve clients' health outcomes. Occupational therapy's role in health management may include developing habits and management strategies for nutrition, physical activity, medications, stress and coping, and improving social skills for problem solving and communication. A

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literature review and informal interviews was used to identify the need within a rural community to develop and implement a chronic condition self-management program.

Project Description: The results of the literature review were utilized to form interventions for program development. The program was developed to educate clients with chronic conditions on a variety of self-management strategies. The efforts of the program aimed towards lifestyle adaptation through habit change and skill development to effectively manage chronic health conditions. The final product contains supplemental materials in module format for occupational therapy practitioners to use when assisting this population.

Results: Program implementation has begun in a rural community hospital where the program has been completed with thirteen patients. When measuring satisfaction with managing chronic conditions at the beginning of the program and at the end of the program, eleven of thirteen of the patients self-reported an increased satisfaction number following the completion of the program. All thirteen of the patients reported they had learned at least one new health related strategies for self-management.

Discussion: Due to small patient participation and limited time, the author is unable to fully measure program effectiveness at this time. However, the program has shown to have positive effects on the majority of the patients who have completed the program. Continuation of the program within clinical practice and future studies will determine the impact the program has on individuals with chronic condition(s) in rural communities.

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121. Supporting Occupational Performance for Children with Cancer

Rachel Koenig, Sarah Nielsen, PhD, OTR/L, FAOTA,

Occupational Therapy Graduate Student

Purpose: The purpose of this doctoral experience was divided into two categories: a) advanced clinical practice and b) needs assessment and completion of project. The advanced clinical practice objectives were to implement evidence-based evaluations and interventions to children with cancer, collaborate with parents and interprofessional team members, and adhere to safety precautions for children with cancer. The project-based objectives focus was to translate knowledge to practice by aiding in the transition process of children with cancer when leaving the hospital.

Method: The primary author completed a literature review of best practices for children with cancer prior to their arrival on-site. Once on-site, the author completed direct patient care with clients as well as collaborated with parents and other healthcare professionals on-site. The author was able to bring best practice interventions, an evaluation, and a project to help bridge the gap in services some children experience when returning home.

Results: The results of this advance clinical practice placement were that the author was able to bring an evidence-based evaluation and interventions in areas of need. The evaluation brought on-site included an evidence-based subjective assessment in the area of pediatric chemotherapy induced neuropathy. One intervention the author was able to implement in an area of need addressed engagement of toys with a medically complex child undergoing cancer treatment. The author was also able to create a guide for parents to implement therapeutic activities at home to help bridge the gap in services some children receive when returning home.

Conclusions: Results of this advanced clinical practice placement included new evaluation and intervention tools that can be used in the pediatric cancer population. The author also showed that using the ecology of human performance model is helpful when completing the occupational therapy process with complex medical patients. The anticipated results of the home activities guide are that it will aide parents in helping their child with ataxia continue to make improvements at home. However, the implications of the home program are ongoing and the author and site will continue to receive feedback from consumers as this product is implemented in practice.

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122. An Occupational Therapy for the Cumulative Trauma Disorder of Trigger Finger: A Case Report

Makenzie Kroupa, OTDS, Karrianna Iseminger, OTD, OTR/L, CHT

Occupational Therapy Graduate Student

Background: The purpose of this product is to focus on furthering exposure to cumulative trauma disorder (CTD) of the upper extremity (UE) through the development of a case report. This will further explore treatment methods, therapy progression, and management for diagnoses that are associated with repetition and the overuse of the UE. The client of focus possesses the UE CTD of trigger finger as the primary diagnosis but has several concurrent conditions. This increases the complexity of the case since the client must navigate the symptomology of UE CTDs to engage in occupational performance.

Case Presentation: The client was selected due to her relevant diagnosis of the UE CTD of trigger finger. After trialing conservative management, the client finally decided upon surgery to assist with the pain, swelling, lack of range of motion, decreased strength, and catching of her involved finger. It was necessary to be cognizant of the client's concurrent diagnoses within her hands as they may have altered how interventions were given. The concurrent conditions include osteoarthritis of her carpal metacarpal joint, joint contracture, peripheral neuropathy of the hand, and arthritic finger joints. Overall, the client was able to progress in all the physical areas she identified as a priority in order to engage in occupational performance.

Discussion: This demonstrated that although there are typical post-surgical rehabilitations to follow, there will still be unique differences for each client based on characteristics, occupations, and contexts. It is necessary to be cognizant of concurrent diagnoses, in addition to the UE CTD, as it may alter response to treatment. By addressing the client as a whole and their lived experiences, this will contribute to the successful rehabilitation of their physical skills.

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123. Sensory Toolkit for Childcare Providers and Parents of Children in the Daycare Setting

Cierra M. Jacobson

Occupational Therapy Graduate Student

Purpose: Around 62% of children in the United States receive care from care-based centers (U.S Department of Education, National Center for Education Statistic [NCES], (2021). Of the children in daycare, about 41% attend for 35 or more hours a week (Capizzano & Adams, 2000). The children's environment within a daycare provides several sensory experiences that can both support and hinder their success in their daily occupations. When sensory needs are unmet, undesired behaviors can occur and impact their performance in daily occupations (Bodison & Parham, 2017). The purpose of this toolkit is to provide a resource for childcare providers and parents to use with children to help meet their sensory needs and increase participation and performance in their daily occupations.

Methods: To create the Sensory Toolkit for Childcare Providers and Parents of Children in the Daycare Setting, an extensive literature review was conducted to gather information about daycare contexts, early childhood development, and sensory needs of children for occupational performance. Main findings of the literature review supported the need for a sensory-based toolkit to be utilized by daycare providers to help meet the sensory needs of all children within the daycare context. Ecology of Human Performance Model (Dunn, 2017) perspectives were used, along with the literature review, to support the development of a sensory-based toolkit to be used by daycare providers to help meet the sensory needs of children in a daycare setting.

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Results: The Sensory Toolkit for Childcare Providers and Parents of Children in the Daycare Setting is to be used by childcare providers and parents of children in a daycare setting. The toolkit is organized to help inform childcare providers and parents on the sensory system and the impacts it can have on daily functioning, and strategies to adapt/modify the environment or activities to meet their sensory needs for improved occupational experiences.

Conclusion: Overall, the development of a Sensory Toolkit for Childcare Providers and Parents of Children in the Daycare Setting was created in collaboration with a rural daycare center in North Dakota to support daycare providers and parents in meeting the sensory needs of the children. Through ongoing use of this toolkit, children's sensory needs will be addressed, therefore increasing their individual participation in daily occupations/activities.

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124. Improving Occupational Performance for Survivors of Sex Trafficking: An Executive Functioning Program

Riley Thomas, OTDS, Dr. Breann Lamborn, Ed.D., M.P.A., Dr. Nicole Harris, EdD, OTR/L

Occupational Therapy Graduate Student

Purpose: In 2021, the U.S. reported 10,360 human trafficking cases, of which 7,499 or 72% were explicitly identified as instances of sex trafficking (National Human Trafficking Hotline, 2021). Sex trafficking is “a form of modern-day slavery in which individuals perform commercial sex through the use of force, fraud, or coercion” (National Human Trafficking Hotline, n.d., para. 1). Due to survivors of sex trafficking being exposed to dehumanizing and traumatic events, this may impact the ability to participate and engage in daily activities related to an individual's executive functioning and life skills. The purpose of this scholarly project was to analyze the impact that sex trafficking has on occupational performance, assess the executive functioning needs of the population, and translate these needs to create a product that will aid in the population's recovery to increase overall health, well-being, and quality of life.

Methods: A comprehensive literature review needs assessment was conducted to determine how occupational therapists and mental health practitioners are able to address executive functioning deficits in survivors of sex trafficking. The creation of the product was guided by the person-environment-occupation-performance (PEOP) model, which analyzed the fit between the person, environment, and occupation and how these factors influence performance in meaningful occupations (Bass et al., 2017).

Results: The product The Executive Functioning Toolkit: The Key to Enhance Performance was developed to enhance executive functioning skills and occupational performance among survivors of sex trafficking. This toolkit is designed to be a guide on comprehending executive functioning skills and recognizing common deficits through a trauma-informed lens, while also outlining appropriate assessments, interventions, and educational resources to support executive functioning skill development for survivors of sex trafficking.

Conclusions: This scholarly project was designed to bridge the gap in the existing literature and advocate for occupational therapy services for survivors of sex trafficking. Furthermore, the hope is that the toolkit will assist in positively promoting occupational performance and independence in meaningful occupations along with increasing executive functioning skills in survivors of sex trafficking.

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125. Stroke rehabilitation through the continuum of care: Integrating evidence and occupation-based practice

Emily Geissler, Sclinda Janssen, Julie Grabanski

Occupational Therapy Graduate Student

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Purpose: The purpose of this scholarly project was to provide patients with knowledge on the rehabilitation process and practitioners with a resource to assist in implementing occupation and evidence-based practice in stroke rehabilitation throughout the continuum of care.

Methodology: An extensive literature review was conducted using articles, textbooks, and expert opinions regarding evidence-based and occupation-based interventions within stroke rehabilitation. The author partnered with a midwestern healthcare agency to experience stroke rehabilitation as an occupational therapy practitioner across the continuum of care. Through a needs assessment, it was found patients lack knowledge regarding the rehabilitation process and that practitioners lack knowledge of their own profession within other settings. The ecology of human performance (EHP) model, occupational process, and motor learning frame of reference were used throughout to guide the literature review, needs assessment, and time spent within the agency. The guide Stroke rehabilitation through the continuum of care: Integrating evidence and occupation-based practice was developed and shared with the rehabilitation director at the agency to share with practitioners in each setting to utilize in practice.

Results: Although specific results of effectiveness of the guide are unknown at this time, it is anticipated that practitioners will feel more comfortable implementing motor learning theory into practice, use appropriate evaluations tools, and get further understanding of the goals in each rehabilitation setting. It is also anticipated that patients who are given the patient education materials will gain knowledge on strokes, the rehabilitation process, and team members involved.

Conclusions: The guide Stroke rehabilitation through the continuum of care: Integrating evidence and occupation-based practice was created to promote evidence and occupation-based practice throughout the continuum of care in stroke rehabilitation. It was also created to educate patients on their diagnosis and what their rehabilitation process would entail. Due to limited time in the partnering agency, the guide was not implemented into practice. Implementation of a resource that guides occupational therapy practitioners to best practice can enhance outcomes in rehabilitation for stroke patients.

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126. Promoting Independence in an Existing Cancer Survivorship Program: Adaptive Equipment and Intimacy & Sexuality

Bailee M. Scheer, Andrea Young, OTD, OTR/L

Occupational Therapy Graduate Student

Purpose: The purpose of this project was to create educational materials for cancer survivors and their caregivers/families on the topics of adaptive equipment and intimacy/sexuality. A person is considered a cancer survivor at any point after receiving a cancer diagnosis, regardless of what stage they are at in their course of treatment (American Cancer Society, 2024). The rate of cancer survivors within the United States has grown drastically over the past several years, due to advances in treatment and early detection (Cronin et al., 2022). Cancer survivors experience many changing side effects during and after treatment that influence the way they fulfill their life roles (Radomski et al, 2021; Taylor, 2017; TEDx Talks, 2019). Immobility and changes in sexuality/intimacy are common deficits that individuals with cancer face (Taylor, 2017).

Unfortunately, physicians and other healthcare professionals at the affiliated site tend not to ask questions about the topics of adaptive equipment and sexuality/intimacy with this population, leaving gaps in the services that are provided to individuals. Most often, when an occupational therapy referral is placed in this setting, it is to address activities of daily living, fatigue, quality of life, and pain (Stein Duker & Sleight, 2018). Occupation-based survivorship programs benefit survivors by increasing occupational performance and well-being (Murphy et al., 2022). Occupational therapists can take this opportunity to provide education of strategies to promote independence and fulfillment of life roles with cancer survivors.

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Methods: A literature review was completed to understand the unique needs of cancer survivors and occupational therapy's role in oncology care. This served as a basis of knowledge prior to participating in a doctoral experiential capstone at a cancer center that serves individuals of all ages and currently hosts a cancer survivorship program. The ecology of human performance (EHP) framework is an occupation-based framework that was used throughout the completion of this scholarly project to gain a holistic understanding of the person, their tasks, and resulting performance (Dunn, 2017).

Results: The literature review guided by the EHP theoretical model combined with the doctoral experiential capstone placement led to the creation of educational sessions on the topics of adaptive equipment and sexuality/intimacy for cancer survivors. This resource will continue to be taught to cancer...

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127. Occupational Therapy Intervention to Promote Rest and Its Role in Inpatient Rehabilitation Recovery

Kjerstin Drugan, Anne M. Haskins, PhD, OTR/L, Sarah Nordin, OTR/L

Occupational Therapy Graduate Student

Background: Insufficient sleep is a public health epidemic that affects 10-30% of the population, impacts brain functioning, mood, attention, memory, and healing (CDC, 2015) and increases the likelihood of serious medical conditions such as diabetes, high blood pressure, and heart disease (Ho & Sui, 2018). The rate of sleep difficulties increases to 47-67% in the hospitalized population (Miller et al., 2019). According to Poole et al. (2022), 98% of occupational therapists reported believing that sleep assessment and intervention are important in rehabilitation, but less than 25% implemented any intervention. The physical effects and stress of illness and the inpatient rehabilitation environment affect sleep quality, yet it is not commonly addressed in practice.

Project Description/Results: To address the identified gaps in practice, the development and implementation of two guides (one for inpatient rehabilitation staff and one for clients) were created based on a literature review, needs assessment, discussions with stakeholders, and the Ecology of Human Performance (Dunn, 2017). The guides facilitate stakeholders' understanding of the importance of sleep, the impact of common illnesses and the inpatient rehabilitation environment on sleep, assessments to evaluate barriers to sleep, and respective interventions. The barriers include altered routines, stimulating environments, and medical complications. This project represents the scholarship of application as published research and theory was compiled and translated into practice.

Discussion: Inpatient rehabilitation centers are uniquely positioned to provide education to clients on sleep skills that promote health outcomes both in the center and following discharge (Sullan et al., 2021). Two materials were developed to allow for varying levels of practitioner involvement to suit the limitations of the product (time, productivity, and insurance requirements of the setting) while still addressing the need. The design of the materials encourages self-directed and independent client use to occur. All materials are available to all facility staff to increase the likelihood of its use with clients. Implementation of a multifaceted guide allows staff and clients to address an occupation commonly forgotten and improve the health and wellness outcomes of clients.

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128. Addressing Classroom Behaviors through Sensory-Informed Design and Instruction to Support Performance and Participation

Monicah Nyakoe, OTS, Jessa Hulteng, Ph.D., MOT, OTR/L, CLT

Occupational Therapy Graduate Student

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Purpose: In the United States, students spend a significant portion of their day within the school setting. The school environment, rich with sensory experiences, can either bolster or hinder a student's success and behavior. Research has indicated that unaddressed sensory needs may lead to disruptive behaviors and reduced educational engagement and participation. The purpose of this project was to empower educators with the understanding and tools to identify sensory needs and to shape sensory-supportive environments, ensuring students can thrive to their fullest potential in their educational occupations.

Method: The Person-Environment-Occupation-Performance (PEOP) model was the theoretical framework that guided this project. The identification of the site-specific need was achieved through a comprehensive review of the literature and an on-site needs assessment, which included classroom observations, interviews with educators, and consultations with practicing occupational therapy practitioners, culminating in the development of a targeted product to effectively address these needs.

Results: An educational professional development PowerPoint was developed for in-service training, allowing educators to engage with the material at their convenience. In addition, a classroom sensory resource guide and a questionnaire were created to equip educators with practical tools and strategies for addressing sensory needs within the learning environment.

Conclusions: The professional development materials created in this project serve as a catalyst for interprofessional collaboration, equipping educators to effectively recognize and address the sensory challenges that affect student engagement and behavior. This initiative echoes the body of research advocating for collaborative approaches in educational settings, which seeks to remedy gaps in educator readiness and cultivate inclusive practices that benefit all students. Ultimately, this product aims to enrich the learning environment, affirming the critical importance of sensory support in fostering students' academic achievement and overall well-being.

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129. Real Individuals Striving for Excellence (RISE): An occupation based re-entry program for a rural jail facility

Kennedy M. Tooke

Occupational Therapy Graduate Student

Purpose: The United States criminal justice system continues to be known for currently holding over 2 million people within state, federal, local, and juvenile correctional facilities (prisonpolicy.org, 2021). Jail incarceration rates have increased 15% from 2020 to 2021 following a 26% decline from midyear 2019 (Zeng, 2022). Many individuals involved in the criminal justice system will be arrested again within the same year due to unsuccessful transitions back into the community. The purpose of this scholarly project was to develop a program aimed at reducing recidivism rates among individuals incarcerated in rural correctional facilities.

Method: A needs assessment was conducted through a comprehensive literature review in order to identify the facility and individual needs of the targeted population. The development of this program was guided by the Model of Human Occupation [MOHO] (O'Brien, 2017). While the role of occupational therapy (OT) in this context is still emerging, literature supports the unique scope of OT practice as beneficial for this population. The overarching goal of OT in this setting is to create a holistic, client-centered, occupation-based program that assists individuals with a history in the criminal justice system through enhancing essential skills for success in community reintegration.

Results: It is anticipated that this program will support individuals involved with the criminal justice system to gain skills needed to be successful during their transition from incarceration to community and reengage in healthy meaningful occupations.

Conclusions: RISE was collaboratively developed with a local correctional facility to enhance the success rate of community transition following incarceration. The program also aims to raise awareness of available community resources for individuals involved in the criminal justice system. Utilizing the OT scope of

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practice in program development, participants are provided with the opportunity to acquire essential skills crucial for a successful transition to the community. This includes making necessary life changes conducive to a more positive lifestyle, ultimately contributing to an overall improvement in health and well-being, and concurrently reducing rates of recidivism.

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130. Addressing Psychosocial Factors in Upper Extremity Injuries to Improve Outcomes and Quality of Life.

Jace Allard, OTS, Jane Loscheider, OTD, OTR/L, ATP, CLT

Occupational Therapy Graduate Student

Purpose: Following upper extremity injuries, negative psychosocial factors such as anxiety, stress, post-traumatic stress disorder, and depression are found to be prevalent (Hardison et al., 2021; Maddison et al., 2023). Negative psychosocial symptoms such as these can negatively affect recovery outcomes and quality of life for individuals (Kinsley et al., 2020; Sposato et al., 2018). Typical treatment received in hand therapy for individuals with upper extremity injuries consists primarily of physical remediation through a biomedical frame of reference and less on addressing psychosocial factors (Chown et al., 2018; Kurrus et al., 2022; Robinson et al., 2016). Certified hand therapists report a lack of priority, time restraints, unavailable or unfamiliar assessments, fear of negative client response, and perceiving psychosocial interventions as outside their scope of practice as reasons for the disparity (Chown et al., 2018; Kurrus et al., 2022). This project was completed to help equip occupational therapy practitioners to effectively address psychosocial factors within their practice to support outcomes and quality of life for individuals recovering from upper extremity injuries.

Method: A needs assessment was conducted including a literature review, skilled observation, and collaboration with a certified hand therapist to identify the need to address psychosocial factors in hand therapy. Current practices were analyzed and supports and barriers to addressing psychosocial factors were identified using the Person-Environment-Occupation Model (Law et al., 1996). Evidence-based psychosocial practices within occupational therapy were researched, trialed in a hand therapy setting, and organized for dissemination.

Results: A toolkit containing educational material, screens, and various interventions was created to support occupational therapy practitioners address psychosocial factors within a hand therapy practice.

Conclusions: The toolkit created has provided a resource for occupation therapy practitioners to utilize to better address psychosocial factors in hand therapy. Continued discussion and resources are needed to normalize addressing psychosocial factors in hand therapy settings.

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131. Specialized Knowledge in Feeding and Eating Best Practices

Katie DeBoer, Roberta Carrlson PhD, OTR/L

Occupational Therapy Graduate Student

Purpose: The process of gradually developing from complete dependence to independent self-feeding for a child is critical in social, emotional, physical, and cultural maturation (Korth & Maune, 2020). The purpose of this Doctoral Experiential Capstone is to complete a thorough needs assessment to find the current gaps in the literature, frequently used and effective evaluation methods, and research-based interventions in the area of feeding, eating, and swallowing to be applied to a pediatric outpatient clinic and to provide advanced clinical experience for a occupational therapy (OT) Doctoral Capstone Student. It was hypothesized that the creation of an intervention guide and goal bank will increase oral motor development, sensory desensitization, improve social/emotional behaviors, and healthy habits for the client/family.

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Method: The author conducted a literature review and informal meeting with OT practitioners. The Ecological Model of Human Performance was applied to this experience and product development (Dunn, 2017). The author utilized various online resources to find the literature included in this review. Once the need and focus of the product were clear, the author completed a 14-week advanced clinical placement to create the product and learn the advanced practice skills by supervised treatment of feeding, eating, and swallowing pediatric caseload. The goal bank and intervention guidelines were then given to the facility to meet the need.

Results: The product created allowed the practitioners to create more direct goals to meet the need of the client and see a positive change in the child, as evidenced by a progression in the child's skills (oral motor development, sensory desensitization, improved social/emotional behaviors, and habits for the client and family) reflected in charted progress notes.

Conclusions: Furthering the feeding, eating, and swallowing program at the local clinic, improve mealtime behaviors and skills of pediatric clients, and provide advanced clinical skills in the area of feeding, eating, and swallowing for the student was the intended result. This product was used by OT practitioners with advanced-level training in feeding therapy to create client-centered, occupation-based goals and implement the intervention guidelines. Although the author saw short-term gains through the implementation of this product, further evaluation of the results is ongoing.

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132. Childhood Feeding and Eating Evaluation and Home Programming

Alexis Lehmann, Bobbi Carrlson

Occupational Therapy Graduate Student

Background/Purpose: Up to 20% of typically developing and about 80% of atypically developing infants and children suffer from feeding difficulties (Chatoor & Macaoay, 2008; Nichols et al., 2018). These feeding difficulties may lead to delays in growth and development, refusal to eat, behavioral issues, and medical complications (Chatoor & Macaoay, 2008). Occupational therapists address these feeding difficulties through the therapeutic process, which includes initial evaluation, intervention, re-evaluation, and discharge planning (American Occupational Therapy Association [AOTA], 2020). When completing a feeding evaluation, practitioners often rely on skilled observation and their clinical judgment to determine what is developmentally appropriate. Occupational therapy services for children who have difficulties with feeding often focus on broadening the amount or variety of foods that the child consumes. This is done through a variety of interventions, including caregiver education. Caregivers are typically included in as many interventions as possible to provide safety and consistency to the child at mealtimes across settings. However, feeding is a complex occupation and can be very difficult to understand. The goal of this project is to provide pediatric occupational therapists with a user-friendly, evidence-based guide through the therapeutic process for children with feeding difficulties.

Methodology: A literature review and needs assessment were conducted to identify gaps in current services provided at a pediatric outpatient clinic in the Midwest. The author then collaborated with occupational therapy and speech therapy practitioners to develop and implement the final product. The Ecology of Human Performance framework (EHP) and adult learning theory were utilized throughout the development and implementation of the product.

Results: The outcome of this scholarly project is an evidence-based guide through the therapeutic process for therapy practitioners to utilize with children with feeding difficulties. The guide includes an evaluation form, food checklist, and caregiver education handouts. The product is intended to be used in conjunction with skilled therapy services to increase ease of documentation and aid practitioners in holistically evaluating and treating children with feeding and eating difficulties.

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133. The Distinct Role: A Toolkit to Promote Occupational Therapy Services for Palliative Care Patients in Acute Care Hospitals

Kailey A. Squier

Occupational Therapy Graduate Student

Purpose: Each year, 56.8 million people receive palliative care services and experience significant impacts overall quality of life. Occupational therapy is well-equipped to maximize engagement in meaningful activities and improve overall quality of life for this population. Despite evidence supporting the unique value of OT, it has had many barriers limiting the ability to expand into palliative care effectively. There is a need to provide education and increase resources to occupational therapy practitioners (OTPs) in palliative care. The purpose of this scholarly project was to increase the understanding of OTs' role in palliative care and promote increased OT services within this practice area by developing a toolkit for OTPs to utilize throughout the OT process.

Method: The Model of Human Occupation (MOHO) was the theoretical framework used to guide the development and implementation of this product. This was done through a thorough literature review and the completion of an extensive needs assessment. Findings from the literature review and needs assessment were analyzed and led to the decision to create a toolkit, "The Distinct Role: A Toolkit to Promote Occupational Therapy Services for Palliative Care Patients in Acute Care Hospitals" and a brief handout, "A Quick Guide to Occupational Therapy's Role with the Palliative Care Population," for OTPs to utilize as a resource during client sessions.

Results: It was hypothesized that there was a need for increased education and training on OTs' role in palliative care. This was supported by the literature and needs assessment. In response to the need for increased education and training, an educational toolkit and brief handout were created to increase the knowledge of OTs' role in palliative care and promote increased OT services within this practice area.

Conclusions: The Distinct Role: A Toolkit to Promote Occupational Therapy Services for Palliative Care Patients in Acute Care Hospitals addresses significant barriers and fills critical gaps that OTPs are undereducated and undertrained in their distinct role in palliative care. By providing an in-depth guide to OT practice in palliative care, this toolkit provides the education necessary for OTPs to increase their knowledge, skills, and training in this practice area and expand OT services for this population. This toolkit is a resource for current and future OTPs to expand this emerging practice area.

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134. Sensory Home Programming Handouts

Taylor A. Koopmeiners

Occupational Therapy Graduate Student

Background: Sensory processing is the way the brain and nervous system receive sensory information (Star Institute, 2023). When there are difficulties with processing sensory information, it is called Sensory Processing Disorder (SPD). Consequently, the inability to process sensory input results in affected motor and behavioral responses (Star Institute, 2023). This creates difficulty in participating in necessary tasks such as activities of daily living (ADLs), social participation, and school (Lane et al., 2019; Star Institute, 2023). Occupational therapists address these challenges by providing sensory activities in therapeutic sessions and as part of home programming. (Gabriele, 2020). The goal of this scholarly project is to provide sensory home programming handouts for occupational therapy practitioners. These handouts are to be given to parents and consist of sensory activities for children struggling with sensory processing disorders. These handouts contain definitions of each of the sensory systems to give parents an understanding of the input being targeted. Handouts are to be provide to parents on evaluation or while treating.

Methodology: This project began with collecting evidence to create a comprehensive literature review to identify intervention efficacy and needs for children who struggle with sensory processing disorders and the

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processing/integration of sensory input. Based on this evidence, home programming handouts were developed and implemented. The product was developed utilizing Ecology Human Performance (EHP) as a guide for literature review and interventions (Dunn, 2017). Additionally health literacy and readability principles were used to format and develop each handout.

Results: The home programming handouts provide practitioners with resources to provide parents with. These resources will educate parents on activities to assist in sensory regulation through various sensory inputs. Additionally, it supports health literacy by defining targeted sensory systems and sensory activities. By utilizing readability principles throughout product development, enhances health literacy by ensuring information is clear to promote understanding.

Conclusion: Occupational therapy practitioners will have access to a resource that will help educate parents on sensory activities and provide them with tangible items to reference. This product will result in patients having increased task participation, performance range, and quality of life.

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135. The Role of Occupational Therapy to Support Engagement in Activities for Adults Throughout the Cancer Continuum

Alexis Broisma, Jessa Hulteng, Sabrina Sowles

Occupational Therapy Graduate Student

Purpose: More than 18 million people currently living in the United States have received a cancer diagnosis sometime throughout their lives. Advancements in treatment for cancer are increasing the livelihood of those surviving cancer, but there are lasting challenges. More than 40% of individuals within the cancer continuum continue to experience performance challenges with their daily tasks. Occupational therapy can target these challenges, but this profession is underutilized within cancer care. The purpose of this project was to increase awareness of occupational therapy's role in cancer care, educate providers, and create a resource to address the needs of the cancer population to improve performance in daily tasks.

Methodology: The ecology of human performance (EHP) model was utilized to guide the evaluation of literature and create resources for this project. An extensive literature review was completed. Prior to completing a needs assessment, Institutional Review Board (IRB) approval was obtained. After completing the needs assessment utilizing on-site collaboration and a provider survey, it was determined that a screening tool and patient education were needed. The Occupational Therapy-Based Oncology Toolkit (OT-BOT) resource was created based on the literature review and needs assessment.

Results: The OT-BOT was created in response to limited occupational therapy referrals and limited education for patients to address challenges they experienced in daily tasks. The Task Performance Screening Tool (TPCST) screening tool, informational resources for patients, and education about the role of occupational therapy within cancer care were resources included within the OT-BOT. The use of the OT-BOT was disseminated to the cancer center's providers and implemented into patient care. A limitation of this project was that it was limited to a small cancer center facility.

Conclusion: The OT-BOT was created to promote the cancer population's performance in daily tasks by implementing an occupational therapy provider screening tool and patient educational resources. The created resources addressed information to address the daily challenges cancer patients experience and to raise awareness for the role occupational therapy can play in cancer care. Any future use of the OT-BOT in other locations will need to be evaluated to determine an appropriate fit between the needs of the site and the education within the resources.

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136. An Occupational Therapy Program for First Responders Facing Trauma Fatigue Using Equine-Assisted Therapy Approaches

Kady Locke, OTDS, Karol Santistevan, MOT, OTR/L, Kelly Dornbier, OTD, OTR/L, Scilinda Janssen, PhD, OTR/L, CLA, FAOTA

Occupational Therapy Graduate Student

Background: The proposed program is a mental health program, targeting meaningful daily occupations for the population of first responders facing trauma fatigue and antecedents of post-traumatic stress disorder symptoms related to stress from work. For individuals who serve as first responders, there is significant prevalence for trauma exposure, leading to trauma fatigue due to events encountered on the job. Mazur and Collins (2023) found that 80% of police and first responders experience traumatic events on the job and that 25% have experienced suicidal ideation due to impacts of trauma exposure. There is a lack of professional mental health services supporting this population, therefore the program is designed as a resource to support mental health amongst first responders. This project was completed under the supervision of an outpatient mental health occupational therapist, at a practice that uses equine-assisted therapy (EAT) approaches for interventions. The use of EAT approaches allows for additional leverage in treating mental health concerns, allowing for connection to be built and fostered within a supportive, unique environment (Taylor, 2020).

Project Description: The program focuses on increasing occupational participation in relation to mental health. It is intended to be implemented over the course of six weeks or as an intensive program over the course of three days. The program consists of six group sessions focused on providing valuable resources to sustain mental health and wellbeing. The sessions focus on areas of occupation including activities of daily living, instrumental activities of daily living, social participation, health management, and work (AOTA, 2020). Sessions consist of EAT approaches to target improvement in mental health. Implementation consists of a group-based approach to instill peer support. Sessions address social emotional wellbeing in relation to occupations, by implementing strategies such as coping skills, communication strategies, leadership skills, and team-building activities.

Discussion: The program will provide the target population with useful skills to maintain health and wellbeing by supporting their mental health and encouraging peer support. This program could be easily generalized to other populations that face mental health challenges. The program will support the mental health of first responders, leading to decreased mental health concerns and suicide attempts or ideations within this population

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137. An Intergenerational Program Approach to Support Successful Aging and Decrease Social Isolation in Nursing Home Residents

Mariah Herring, Kelly Dornbier, OTD OTR/L

Occupational Therapy Graduate Student

Purpose: As older adults transition to nursing facilities, their involvement in community activities diminishes, impacting their physical health, cognitive abilities, and social engagement (Lowry et al., 2012; Serrat-Graboleda et al., 2010). Evidence suggests that utilizing intergenerational programs in nursing facilities can effectively reduce social isolation, enhance quality of life for residents, and support academics and social skills in preschool students (Gustavsson, 2015; Lowry et al., 2012; Mondaca et al., 2018; Pillemer et al., 2022; Tak et al., 2015). This scholarly project aims to support successful aging and decrease social isolation in nursing facilities through the development of occupation-based psychomotor activities for an established intergenerational program.

Methods: A comprehensive literature review was completed to determine: (1) the supports and barriers to intergenerational programs, (2) the impact of social isolation in older adults, and (3) the use of psychomotor activities to promote positive health outcomes. The ecology of human performance (EHP) guided the

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literature review to support the development of the activity guide (Dunn, 2017). Before starting the on-site doctoral experience, a needs assessment was completed to determine the gaps in the literature and inform product development. Product development was then carried out to meet the needs of rural Minnesota's assisted living and memory care facility.

Results: Results indicate the need for intergenerational coordinators to implement psychomotor activities to enhance health outcomes, quality of life and decrease social isolation in nursing facilities. The results of this scholarly project included a 36-session psychomotor activity guide to assist with activity planning and increase older adults' engagement in the intergenerational program.

Conclusions: There is a need to address social isolation within nursing facilities to support the health outcomes of older adults. The activity guide will supply the nursing facility with evidence-based psychomotor activities to target positive health outcomes and support successful aging.

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138. Primary Reflex Testing and Integration Guide for Parents and Providers

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Occupational Therapy Graduate Student

Purpose: Parents are often unaware of the signs and characteristics of retained reflexes making it difficult to identify if there is a problem (Grigg et al., 2018). Once a problem is identified parents are frequently uninformed of the effects of primary reflexes on a child's development and how to foster integration (Grigg et al., 2018). Therefore, demonstrating a need for parent and provider education to support reflex integration amongst the pediatric population. This project aimed to educate parents and providers on retained primary reflexes in children ages four to 11.

Methods: Prior to the start of the Doctoral Experiential Capstone (DEC), an extensive literature review and needs assessment was completed using the ecology of human performance (EHP) model for guidance (Dunn, 2017). Upon arrival at the pediatric fitness facility, the initial needs assessment was built upon to narrow down the focus of the product and determine which primary reflexes would be included.

Results: The product includes a primary reflex guide for parents and providers including primary reflex descriptions, developmental delays associated with retained primary reflexes, reflex retention screening, and integration exercises for five primary reflexes.

Conclusions: Primary reflexes play a crucial role in infant and child development (Chandradasa & Rathnayake, 2020; Gieysztor et al., 2015). Increased awareness of primary reflex retention, integration management, and clinical significance of reflexes is warranted for parents and providers (Chandradasa & Rathnayake, 2019). The product increases functional outcomes related to child learning, development, and behavior by supplying parents and providers with education and resources (Chandradasa & Rathnayake, 2019). Pediatric occupational therapists can assist with the management of retained primary reflexes by providing home-based exercises and parent education (Chandradasa & Rathnayake, 2019; Grigg et al., 2018; Melillo et al., 2020).

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139. Expecting Better When You're Expecting: Empowering Mothers Through Occupational Therapy

Ann Landreville, Anne Haskins, and Brianna Walvoort

Occupational Therapy Graduate Student

Background: The maternal health crisis of the U.S. presents an opportunity to improve the care provided to the maternal population. A new standard of care must be established to contribute to decreasing maternal mortality and morbidity rates and promote the health and well-being of mothers. While many well-

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recognized health professionals currently play a role on the care team for postpartum mothers, occupational therapy practitioners (OTPs) are emerging as an important member of this team, proving they have a vital role in providing services that address the current gap in care. OTPs provide a unique healthcare lens as they address the physical, social, psychosocial, and environmental aspects of the mother's life. OTPs in the postpartum acute care hospital setting strive to provide proactive, preventative services to avoid complications contributing to maternal death and disease. With occupational therapy (OT) services, expecting mothers can start expecting more comprehensive care and enhanced quality of life.

Project Description/Results: The results of this project represent the Scholarship of Application. After meeting with relevant stakeholders, interacting with mothers, reviewing current published evidence, and applying models of practice, a product was designed to meet the needs of new mothers, including social support, access to evidence-based resources, and information on the role of OT. To address these needs, a booklet was made to be given to new mothers during their postpartum hospital stay. The booklet was constructed with the patients' needs in mind, based on the constructs of the Model of Human Occupation and the Perinatal Maternal Health Promotion model, and intended to be utilized as a tool to introduce mothers to OT and provide them with appropriate resources.

Discussion: By working with OT, moms can be evaluated and treated holistically, reducing incidents of poor maternal health outcomes. While OT services are rather new to maternal health, it is expected that services will soon expand, and OT will be more widely recognized as part of the care team for new mothers. This product will contribute to furthering the progress of awareness and underline the significance of OT services in this field. Plans for future study include conducting Discovery research to contribute to the current literature, expanding services, and providing more specialized services for subpopulations.

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140. A sensory protocol (for practitioners) across the continuum of care for people who have experienced traumatic events

Katya A. Kivi

Occupational Therapy Graduate Student

Background: A large majority of people who are receiving mental health services have experienced a form of trauma (Arnaly et al., 2019; Champagne et al., 2010). Individuals who have experienced trauma-related sensory processing issues often have decreased occupational performance because of avoidance of the occupation or dysregulation during the occupation (Cerny, 2019; Gerney & Muffly, 2015). PTSD can affect an individual's overall quality of life and the creation and maintenance of social relationships, resulting in social isolation (Arnaly et al., 2019).

Project Description/Results: The product is a guide to inform care within the adult mental health setting following sensory-based information and trauma-informed care. The guide includes an overview of this population's best practices and evaluation and intervention guidelines. This product is intended to guide practitioners in creating individualized sensory interventions to increase the feeling of safety, increase sensory processing and sensory regulation to facilitate recovery, and increase occupational performance (Champagne et al., 2010).

Discussion: The importance of this product is that there is a need across the continuum of care for sensory-based and trauma-informed care with people who are experiencing mental health difficulties and have experienced a traumatic event. This scholarly project provided the agency with an evaluation and interventional protocol, both individual and group intervention sessions, and educational resources for the clients. This can be expanded by modifying this protocol for a community care behavioral health organization or adapting this process for outpatient occupational therapy or inpatient at the hospital.

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141. Multi-Cancer Early Detection tests versus Low-Dose CT in Lung Cancer Screening

Maren J Dockter PA-S, Mindy Staveteig, MPAS, PA-C

Physician Assistant Graduate Student

Lung cancer is responsible for the most cancer-related deaths worldwide (de Koning et al., 2020). While the implementation of low dose CT (LDCT) screening for high-risk individuals has been shown to improve outcomes and reduce mortality by 20%, there is still room for improvement in screening ("Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening," 2011). Multi-cancer early detection (MCED) tests aim to detect early-stage cancer with the goal of improving treatment outcomes. This technology works by combining plasma analysis for cell-free DNA and methylation patterns with artificial intelligence to detect malignancies and predict tumor origin sites. The purpose of this systemic literature review is to assess the rising potential of MCED for screening and early detection of lung cancer compared to LDCT. This review utilizes searches of PubMed and ClinicalKey using both Mesh terms and key terms. A total of 14 articles published over the last 20 years were included for analysis. These articles include peer reviewed, case-controlled studies, observational studies, and prospective studies utilizing modeling. The results of this review indicate that MCED has a higher specificity than LDCT resulting in significantly less false positives, however, the sensitivity of MCED for detecting lung cancer is not consistently high enough to replace LDCT. At this time, LDCT remains the gold standard for screening and early detection of lung cancer and should continue to be utilized in clinical practice. This study focused exclusively on lung cancer, but MCED has the capability to detect more than 50 types of cancer, many without a current screening. Further research should be conducted to explore the role of MCED as an adjunct to traditional cancer screenings.

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142. ADVANCED PRACTICE PROVIDERS IN EMERGENCY MEDICINE

Matthew J. Kalonick PA-S, Mindy Staveteig, PA-C

Physician Assistant Graduate Student

The emergency department is at the core of healthcare in western medicine. It is commonly the first site of patient contact prior to admission or surgical intervention. Management of admission and discharge from the ED is integral to efficient flow of hospital operation. The critical operation of the ED has long acted as a barrier for the application of advanced practice providers (nurse practitioners and physician assistants) from being heavily utilized in this setting. As healthcare costs, physician shortages, and the acceptance of APPs has increased over time, EDs have increased their utilization of APPs. However, there remains concerns regarding the utilization of APPs in the ED. The purpose of this literature review was to evaluate the performance of APPs, specifically PAs, in the setting of the ED. Relevant recent peer reviewed studies were collected and analyzed for relevancy to the topic. This systemic review finds that utilization of PAs in the ED is a cost-effective decision that results in no significant change to patient outcomes or efficiency metrics when compared to physicians.

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143. Comparing Effectiveness of Intrauterine Devices Versus Oral Contraceptives for Management of Dysmenorrhea

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Physician Assistant Graduate Student

The purpose of this research and systematic literature review is to determine if oral contraceptives or intrauterine devices are more effective in the treatment of dysmenorrhea pain. It is estimated that at least

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50% of women worldwide live with dysmenorrhea and there is very little research determining what the best treatment options are for it. The main treatment recommended by health care providers for dysmenorrhea are non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen. However, this treatment option may not provide the relief that women with this condition need. This review used three main databases, including PubMed, Embase, and Clinical Key in order to find pertinent research and articles. A variety of key words were used in the search, such as dysmenorrhea, oral contraceptives, and intrauterine devices. The studies found were then narrowed down by excluding studies older than 2011 and including relatively pertinent studies that were either randomized controlled trials, clinical trials, open-label, parallel group studies, interventional studies, observational studies, secondary analyses, or pilot studies. Out of the studies included in this review, only one compared the effectiveness of oral contraceptives and intrauterine devices. Each study reviewed showed that oral contraceptives and intrauterine devices were safe and effective options, but this one study determined that although they were both effective in the treatment of dysmenorrhea, intrauterine devices were superior. The evidence also showed that intrauterine devices were often not as well tolerated and resulted in discontinuation of use due to the side effects. Despite the results of the article, more research needs to be conducted prior to making a definitive decision on the best treatment method for dysmenorrhea pain.

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144. Comparing the efficacy of heart-conserving measures and retransplantation for chronic rejection in the pediatric population

Lacey Zeiszler, Vicki Andvik

Physician Assistant Graduate Student

Coronary allograft vasculopathy (CAV) is the leading cause of morbidity and mortality among pediatric heart transplant recipients and faces unsuccessful treatment for prevention and management. Post-transplant immunosuppressive therapy has been modified over the years to determine the most effective regimen for rejection. Tacrolimus has been the superior immunosuppressant used for rejection since the early 2000s. It has been shown to have substantial immunosuppressive effects, least number of adverse effects, and decreased comorbidities compared to other regimens. Despite these advantages, CAV is still prevalent. Heart retransplantation is currently the only curative treatment. Google Scholar, PubMed, ClinicalKey, ScienceDirect, Elsevier, Wiley Online Library, and National Library of Medicine were used to compare current data on heart-conserving measures and heart retransplantation for CAV in the pediatric population. New drugs have become available that bear comparison with tacrolimus, such as everolimus and sirolimus. These drugs are shown to be more effective in long-term prevention and management of CAV than tacrolimus. Incorporating widely known drugs into treatment regimens, such as statins and aspirin, have been observed to have no effect on chronic rejection. Advanced technology has produced drug-eluting stents small enough for pediatric patients for short-term use as restenosis is inevitable. Heart retransplantation is inferior to heart-conserving measures as complications decrease life expectancy significantly more.

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145. Comparison of Platelet-Rich Plasma Injections and Hyaluronic Acid Injections in the Treatment of Knee Osteoarthritis

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Physician Assistant Graduate Student

Purpose: Osteoarthritis is one of the most common diseases that people can suffer from in today's society. This degenerative disease can affect any of the body's joints, but is most common in the knees, hands and spine. This review studied and compared the effects of two specific treatments for knee osteoarthritis: platelet-rich plasma injections and hyaluronic acid injections. Both of these treatments can be provided by

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a primary care provider that has the proper training as well as an orthopedic specialist. Platelet-rich plasma injections (PRP) are the patient's own blood products reintroduced into the affected joint to stimulate healing. Hyaluronic acid (HA) occurs naturally in the body, and when injected into a joint suffering from osteoarthritis, it can act as a joint lubricator/shock absorber to help decrease pain and improve function.

Methods: A literature review was performed using the online databases CINAHL and PubMed. Keyword searches were used to find articles that discussed the use of platelet-rich plasma injections or hyaluronic acid injections in the treatment of knee osteoarthritis. Keywords that were used were osteoarthritis, injections, platelet-rich plasma, hyaluronic acid, knee, and combination injections. Between the two databases, there were a total of 417 studies found. Most of the studies were excluded because they either discussed different types of injections for treatment (such as corticosteroid injections) or they discussed other joints that were treated besides the knee joint.

Results: The results of this analysis showed that both PRP injections as well as HA injections can both be beneficial to the treatment of osteoarthritis of the knee. However, it was discovered that PRP injections were more beneficial in reducing pain, improving symptoms and possibly delaying surgery when compared to HA injections. A combination of PRP/HA injections were shown to have the best results, but this combination does not show up clinically very often.

Conclusions: This project found that PRP injections are more efficient at improving symptoms in patients that experience knee osteoarthritis when compared to HA injections. These injections can be used by primary care providers who have extra training or an orthopedic provider. These injections can help streamline treatment of osteoarthritis if performed by a primary care provider by providing symptom relief until the problem is completely surgical.

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146. Efficacy of Complementary Manual Therapies for Labor Pain Management

Emily K. Yenter, Julie Solberg, MPAS, PA-C

Physician Assistant Graduate Student

Labor and delivery pain is commonly considered to be the most pain a woman will ever experience. Options for pain control during labor include pharmacological and nonpharmacological. The purpose of this systematic literature is to determine if complementary manual therapies such as massage therapy, acupuncture, and reflexology are effective nonpharmacologic management tools for labor pain. The electronic databases PubMed and ClinicalKey were searched, and the ten studies chosen for this review were randomized controlled trials published within the past ten years. Current research provides significant data supporting these three complementary modalities as effective nonpharmacologic management tools to control labor pain. Pain was effectively reduced at multiple points throughout the labor process in each of these studies. Future research could be conducted in the US using therapies in combination as well as using therapies to supplement pharmacological pain management. This research could aid in providing patient education on additional pain control methods during the childbirth process.

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147. Supplementation with Vitamin D and Calcium and Pre-eclampsia Compared with Daily Prophylactic Aspirin

Katja Berge, PA-S, Kristen Carr, MPAS, PA-C, DipACLM

Physician Assistant Graduate Student

Pre-eclampsia is a hypertensive disorder that occurs during pregnancy. Onset is typically around the 20th week of gestation and serious complications may occur if it is not properly managed. Complications from pre-eclampsia include preterm delivery, disease progression to eclampsia, organ damage, placental

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abruption, and neonatal complications. Initial management involves the use of antihypertensive medications. Current guidelines recommend the initiation of 81 mg aspirin starting at 12 weeks gestation for women with increased risk factors. The goal of this literature review is to examine the effectiveness of calcium and vitamin D supplementation compared to daily prophylactic aspirin use for prevention of pre-eclampsia. The databases utilized for this literature review include Pub-Med, Cochrane Library, Clinical Key, and Google Scholar. Additional relevant studies were found in reference lists of the included studies. This comprehensive review will discuss initiation of therapy, dosing, and pregnancy outcomes. Review of the literature showed a decrease in blood pressure with the use of calcium and vitamin D supplementation. However, there was a greater impact shown with calcium supplementation in populations with a dietary deficiency than those without a dietary deficiency in calcium. The effect of 150 mg daily prophylactic aspirin was shown to reduce the occurrence of preterm pre-eclampsia but did not impact pre-eclampsia after 37 weeks of gestation. Calcium and vitamin D supplementation alone are not currently recommended for prevention of pre-eclampsia during pregnancy. Current guidelines in the United States are to follow the ACOG recommendation with a daily aspirin starting around the 12th week of gestation.

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148. Efficacy of Platelet Rich Plasma Injections to Combat Chronic Tendinopathies

Rachel Kisse, PA-S

Physician Assistant Graduate Student

Tendinopathy is a clinical syndrome marked by persistent localized pain and tendon thickening, stemming from repetitive overuse-induced trauma. This musculoskeletal condition poses diagnostic and management challenges due to its chronic nature. Management entails a multifaceted approach, encompassing activity modification, pain control, and rehabilitative exercise. The pathophysiological shift from inflammation to degeneration highlights the need for changes in comprehensive management strategies in which platelet rich plasma (PRP) injections have gained growing interest with limited literature support for its use in clinical practice. This literature review was performed to inform clinicians about the properties, safety, and efficacy of PRP injections as an adjunctive therapy in chronic tendinopathies. A comprehensive review of 12 clinical trials, exploring the efficacy of PRP injections was performed. The Primary focus of this review investigated the trends in efficacy, including pain reduction and activity improvement in both epicondylar and achilles tendinopathies, using various functional assessments. The findings indicate a positive trend in the efficacy of PRP injections for pain reduction, functional improvement, and fostering tendon regeneration in both epicondylar and Achilles tendinopathies. Combining PRP with physical therapy often yields superior outcomes. Comparisons with steroid injections reveal divergent onset patterns, with steroids providing rapid relief, while PRP exhibited prolonged effectiveness beyond two years. These results urge further exploration of optimal PRP formulations, concentrations, injection intervals, and the role of ultrasound guidance. This comprehensive analysis of PRP injections showcases their potential as an alternative for chronic tendinopathies, emphasizing tissue regeneration and safety. Addressing current limitations and optimizing protocols through further research will enhance our understanding and utilization of PRP in tendinopathy treatment.

149. Mobilized Healthcare: The Future of Accessible Medicine

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Physician Assistant Graduate Student

This literature review discusses the impact that MIH teams can have in our health system. It is well known that there are communities that benefit from MIH teams such as rural or underserved areas; however, this paper discusses a variety of other demographics that may benefit from implementation of MIH teams. It will also evaluate how MIH teams alter patient Emergency Department (ED) visits, hospital admissions, facility spending, and patient outcomes. MIH is a form of preventative medicine that may be better optimized

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by healthcare facilities going forward, and this article helps to weigh the pros versus cons of MIH team implementation in local communities. Databases utilized for the initial article search were Google Scholar, Cochrane, Elsevier, and PubMed. Keywords for the initial search included mobilized integrated healthcare, patient outcomes, rural communities, urban communities, hospital spending, and hospital admissions. The search yielded 2,522 articles prior to the exclusion criteria being implemented which was publication dates being prior to 2017, studies that were not primary research, not in the English language, and had limited quantitative data or small sample sizes. Ultimately 10 articles were included in the final review. Current literature demonstrates how MIH teams can help reduce overall hospital and ED admissions as well as decrease hospital spending and show patient outcome improvement overall. These findings further support the concept that communities should initiate MIH teams more abundantly.

Key Words: Mobile Integrated Healthcare teams, Patient Outcomes, Rural Communities, Urban Communities, Hospital Spending, Hospital Admissions

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150. Sebaceous Carcinoma: Comparing Outcomes of Wide Local Excision and Mohs Micrographic Surgery

Stephany Dimoulas, PA-S, Russell Kauffman, PA-C.

Physician Assistant Graduate Student

Sebaceous carcinomas (SC) have their origin in the sebaceous glands of the dermis and may develop as a result of de novo mutations, from benign sebaceous neoplasms, or as a result of microsatellite instability and loss of mismatch repair gene expression secondary to Muir-Torre Syndrome (MTS). SCs may also arise from the Meibomian glands, the glands of Zeis, or the sebaceous glands of the caruncle if occurring periocularly. Although SCs may occur at any sebaceous gland-containing location, the most common areas of involvement include the periocular, head, and neck regions. Given its capacity for nodal and distal metastasis as well as its association with significant morbidity and mortality, surgical excision must be pursued. The high recurrence rate and tendency of misdiagnosis that are associated with SCs, warrant swift diagnostic measures and the establishment of a gold-standard method of surgical treatment. Therefore, the purpose of this literature review is to compare the efficacies of MMS and WLE in the prevention of recurrence and metastasis of both extraocular and ocular SCs. Research articles were included if they analyzed either procedure individually or if they directly compared the two surgical modalities. No specific requirements were set, however patient inclusion criteria were evaluated in each article and included if similar themes were present. The current data available provides insufficient evidence for the recommendation of a single superior surgical modality. At this time, both modalities can be considered similarly efficacious.

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151. Mood Stabilizers vs Stimulants for the Management of Attention-Deficit/Hyperactivity Disorder and Comorbidity Bipolar Disorder

Karina K. Van Slyke, PA-S

Physician Assistant Graduate Student

BD and ADHD share a lot of similar symptoms such as comorbidities, age of onset, chronic, enduring course of illness with interference of vocational, educational, and developmental milestones. There is immense challenge when it comes to differentiating these disorders due to significant overlap and variable courses of psychopathology in children. Providers need to be aware of the medications that are beneficial for each condition separately and which medications can benefit both conditions. Mood stabilizers are commonly used in bipolar disorder while stimulants are a common treatment for ADHD. A literature review was performed using search databases such as PubMed to answer the question of whether mood stabilizers, stimulants, or the combination of the two would have the most positive effect on these two disorders in children. A total of 14 articles fit the criteria for this literature review. The diversity of

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pharmacological interventions, including mood stabilizers like lithium and divalproex sodium, and atypical antipsychotics such as aripiprazole and risperidone, underscores the complexity of managing this population. The study by Biederman et al. (2008) demonstrated that the mood stabilizer risperidone did improve both mania symptoms and ADHD symptoms in children, with improvements of ADHD seen with symptoms of hyperactive-impulsive and inattentive. The reviewed literature suggests that stimulant medications, such as lisdexamfetamine dimesylate and mixed amphetamine salts, may contribute to an improved quality of life for individuals with comorbid ADHD and BD. This literature review determined that children with BD and comorbid ADHD respond well and show improvement in ADHD symptoms when treated with polypharmacy of a mood stabilizer and a stimulant, with the suggestion that the mood stabilizer be started first before adding the stimulant.

Keywords: attention deficit disorder with hyperactivity, ADHD, bipolar disorder, central nervous system stimulants, antipsychotic agents, anticonvulsants, and piperazines.

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152. Statin Therapy vs. Plant-based Diet for Reduction of Plaque Burden in Coronary Artery Disease

Molly Zak, BS, Kristen Carr, MPAS, PA-C, DipACLM

Physician Assistant Graduate Student

Coronary artery disease is one of the most common chronic health conditions to affect adults in the United States, with heart disease being the leading cause of death. Contributing factors include high prevalence of processed foods containing saturated fats, low fiber diets and poor overall nutrition, and physical inactivity. These practices increase risk of low-density lipoprotein cholesterol (LDL-C) plaque buildup and calcification within arteries that supply the heart, leading to decreased blood flow and subsequent oxygen supply. Treatment for coronary artery disease has traditionally been dominated by HMG CoA-reductase inhibitors, or statins. These medications are more effective than the alternative therapy medications called fibrates, and more affordable than the injectable cholesterol medication class of PCSK9 inhibitors. To determine other possible treatment options for reducing plaque buildup, a literature review was completed using retrospective and case/control studies that emphasized specific dietary changes and exercise regimens. Many participants have hesitations about statin therapy due to side effects including myalgias and arthralgias. The results of this review confirm that statin therapy remains an effective treatment for stabilization of low-density lipoprotein plaques. Additionally, specific, and consistent dietary modifications can contribute to slowed progression of disease. Primary motivation for treatment resistance was also evaluated in this literature review.

Keywords: Coronary artery disease; plaque accumulation; statin therapy; atorvastatin; plant-based diet; LDL reduction

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153. Minimally Invasive Therapies and Mesenchymal Stem Cells in the Treatment of Arthropathy

Steven Bateman, PA-S and Jay Metzger, Ph.D., PA-C

Physician Assistant Graduate Student

It is estimated that 27% of adults over 45 years of age suffer from osteoarthritis of the hip secondary to articular cartilage damage over the lifespan. Joint pain diminishes life quality, limits range of motion and overall activity, and frequently impairs basic ambulation. These functional deficits worsen the progression of comorbidities that are often referred to as lifestyle-related chronic disease as physical activity subsequently declines. This literature review explores the efficacy of minimally invasive therapies that precede and delay surgical intervention in adult patients experiencing functional limitations and pain in major joints. The study examines the effectiveness of various interventions, including physical therapy,

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corticosteroid injection, hyaluronic acid injection, platelet-rich plasma injection, and mesenchymal stem cell (MSC) injection. A comprehensive search of PubMed utilizing MeSH terms yielded 114 relevant studies, which were screened based on inclusion criteria. Keywords such as "mesenchymal stem cells," "arthroplasty," and "joints" were used in the search process. While the review reveals a limited number of studies on MSC therapies with small sample sizes, their proposed mechanism of action remains promising. Low side-effect profiles and evidence of induced regeneration within the joints are encouraging, but studies evaluating their effectiveness compared to other treatments are lacking. Incidentally, findings suggest that corticosteroid injections may accelerate joint disease progression, underscoring the value of alternative treatments such as hyaluronic acid or platelet-rich plasma in the early stages of arthropathy. In conclusion, although MSC therapies lack a robust evidence base, their potential warrants further investigation, while caution is advised regarding the use of corticosteroids in the management of arthropathy.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

155. Association of Rural-Urban Emergency Department Location and Management of Fractures in Elderly visits in United States

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Medical Student

Purpose: Bone fractures remain a common reason for emergency department (ED) visits, especially among the elderly. Given the high prevalence of elderly bone fractures in the ED, it is important to analyze the quality of care across healthcare settings, especially in rural areas where healthcare disparities have been well-established. However, fracture management differences in rural vs urban ED's remains understudied. This study aimed to identify the association between rural-urban ED location and management of fractures in elderly visits in the U.S.

Methods: We conducted a retrospective analysis of elderly (65+ years) fracture visits to EDs utilizing the 2013-21 National Hospital Ambulatory Medical Care Survey Emergency Department datasets. We compared demographics, clinical workup, and treatment of elderly fracture visits in urban and rural EDs. SPSS Complex Samples 29.0 was used to account for the complex sample design. Chi-square and GLM Means tests were performed with all significance tests two-sided and $P < 0.05$ for significant. This study was approved by the Institutional Review Board of the University of North Dakota.

Results: Of the estimated 6.95 million elderly fracture visits to U.S. EDs from 2013-21, 78.7% were in urban EDs and 21.3% in rural EDs. Elderly fracture visits to rural EDs were more likely to be White (98.1% vs 86.9%, $p = .001$) and urgent/semi-urgent triage (92.5% vs 83.2%, $p = .050$). There was no association between ED location and gender ($p = .167$), age ($p = .723$), Medicare ($p = .147$), region ($p = .462$), pain ($p = .297$), upper fractures ($p = .856$), or lower fractures ($p = .849$).

Clinically, 66.6% of elderly fracture received opioid analgesics, 33.8% were admitted and 24.7% went to the operating room. Rural EDs elderly fracture visits were more likely to be cast, splinted or wrapped (42.4% vs 54.2%, $p = .018$) and less likely to be admitted (36.8% vs 22.7%, $p = .023$). There was no association between ED location and (any analgesic ($p = 0.275$), opioid ($p = 0.703$), NSAIDs/Acetaminophen ($p = 0.738$), any imaging ($p = .586$), X-ray ($p = 0.432$), or CT scan ($p = 0.130$).

Conclusion: We found similar rates of imaging and analgesic use in rural and urban EDs in the treatment of elderly fracture visits. However, there were differences in management with rural ED visits having higher rates of casting/splinting/wrapping and lower rates of admission for elderly fractures.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

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44. THE IMPACT OF ADP INHIBITION ON TRAUMATIC BRAIN INJURY OUTCOMES

Dana J. Nielsen, MD; Amanda Mathies, BS; Tyler Sang, PhD; Li Cao, PhD; Chase Howe, BS; Steven Briggs, MD

Medical Resident/Fellow/Transitional

Purpose: The purpose of this study is to identify the influence of adenosine diphosphate (ADP) inhibition on patient outcomes after a traumatic brain injury (TBI), as measured by thromboelastography with platelet mapping (TEG-PM). Patient outcomes were defined as a) hospital length of stay; b) ICU length of stay, c) mortality and d) ventilator days.

Method: This cohort study was conducted at a Level I trauma center, identifying patients 18 years or older who presented to the trauma center with TBI via the electronic medical record. Patient outcomes were defined as a) hospital length of stay (LOS); b) ICU LOS, c) mortality, and d) days on ventilator. Data were also collected on patient characteristics, injury severity using AIS and GCS, and progression of hemorrhage on CT. Outcomes of patients whose ADP inhibition less or equal to 60% were compared to those patients whose ADP inhibition was greater than 60%. Patient outcomes were also compared by ADP inhibition quartiles to pinpoint whether patients with high ADP inhibition have worse outcomes.

Results: A total of 98 patients were included in the current analysis. Patients with ADP \leq 60% were older with lower global severity scores (ISS) and significantly higher GCS. No significant difference in mortality, hospital or ICU length of stay, or progression of lesion on CT scan. In the quartile analysis, GCS was significantly lower and AIS significantly higher in the 4th quartile compared with the other quartiles. Again, mortality, ICU and hospital days, progression of hemorrhage on CT and days on the ventilator were not significantly different across quartiles.

Conclusions: Our study contributes to the work that did not find a significant connection between level of ADP inhibition and outcomes. In our experience, patients with ADP less than 60% inhibited had smaller ISS and greater GCS, implying their injuries were less severe than the group with greater ADP inhibition, which is consistent with prior study. The equivalent ICU and hospital length of stay and mortality, which persisted in both of our analyses, seems to indicate that the ADP inhibition plays a more minimal role in patient outcomes, at least in our population. Our hypothesis that ADP inhibition would be associated with worse outcomes was not reflected in our study. Given our findings, we argue against a narrow focus on exclusively managing ADP in traumatic brain injury patients.

46. Factors Associated With Mammography Screening: Findings From A Nationally Representative Dataset

Rita Ahmad, MD, Abe E Sahmoun, Ph.D.

Medical Resident/Fellow/Transitional

Purpose: Breast cancer is the most common cancer and the second leading cause of death from cancer among women in the United States. The key element of breast cancer prevention is early detection, and mammography screening is an important component of early detection. Previous studies have shown that mammography screening is associated with a reduction in breast cancer-related mortality for women.

The aim of this study was to assess factors predicting and affecting adherence to mammography screening in the United States.

Method: A retrospective analysis was conducted of adult women using the 2021 National Health Interview Survey (NHIS). The American Preventive Services Task Force recommends biennial screening mammography for women aged 50 to 74 years. Inclusion criteria were women 50-74 years of age, who had

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a mammogram within 2 years as part of a routine exam, and who didn't have a history of breast cancer. We analyzed demographic and behavioral variables in relation to reported breast cancer screening. SAS v9.4 was used to analyze the data in a manner that accounts for the NHIS complex sample survey design. Bivariate comparisons were performed using Chi-square test, all significance tests were two-sided, p-value < .05 for significance. Institutional Review Board approval was obtained from the University of North Dakota.

Results: Of the estimated 46,163,035 (unweighted n=6,334) women respondents, the majority (72.8%) had a mammogram within the past two years. Women who reported having anxiety (p=.000), were underweight (p=.020), did not have health insurance (p=.000), were current smokers (p=.000), lived in rural areas (p=.003), and had poor general health (p=.000) were significantly less likely to have had a mammogram within the past two years.

Conclusions: We identified several modifiable risk factors for non-adherence to mammography screening. Breast cancer remains a complex and heterogeneous disease. Regular screening with mammography is the most effective method to detect early-stage disease and decrease mortality. Promoting breast cancer screening among currently unscreened and low screened women may reduce future health disparities.

48. Blunt Adrenal Injury Does Not Affect Outcomes in the Pediatric Population with Isolated Abdominal Injury- A National Trauma Data Bank Review

Anthony Duncan MD, Iktesh Chahal MD, Dustin Nowotny MD, Hilla Sang Ph.D, Mentor Ahmeti, MD

Medical Resident/Fellow/Transitional

Purpose: The incidence of blunt abdominal injury (BAI) in the adult population has been estimated to be between 0.03% and 4.95%. However, the impact of BAI on the pediatric population remains unknown.

Method: We conducted a retrospective review of National Trauma Data Bank datasets for the years 2017-2019. We included patients under the age of 18 who experienced blunt trauma and had suffered a blunt abdominal injury with an Abbreviated Injury Scale (AIS) severity score of 2 or higher.

Results: Out of the 8,064 pediatric patients with isolated abdominal trauma, 134 patients also suffered from BAI. We found no difference in the outcomes of patients with blunt adrenal injury in terms of mortality, length of stay in the intensive care unit (ICU) and hospital, and the number of ventilator days. Within poly-trauma patients BAI was associated with worst patient outcomes.

Conclusions: This study demonstrates that BAI has minimal clinical impact on patient outcomes in isolation. However it is associated with worst outcomes in poly trauma patients suggesting correlation with increased trauma burden.

50. Unveiling the Intersection: Race's Role in Age Disparities Among American Indians in Emergency Surgery

Anthony Duncan MD, Conor Roche MD, Mark Williamson Ph.D, Mentor Ahmeti MD

Medical Resident/Fellow/Transitional

Purpose: American Indian and Alaska Native (AIAN) populations have been shown to have severe health disparities, with increased 30-day mortality rates and surgical complications. They continue to represent a population that has worst outcomes however still under represented within the medical literature. Further research into AIAN is critical to start to determine why these differences exist.

Method: A retrospective review of patients undergoing abbreviated laparotomies between 2015 and 2023. Logistic regression was used to compare variables (age, race, gender, ASA, Apache II, ICU admission, Ventilation, number of operations and time until abdominal closure.)

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Results: The AI/ANs undergoing abbreviated laparotomies had a mean age of 47.5 years, whereas white patients had a mean age of 62.1 years ($p < 0.0001$). There were no statistically significant differences in mortality rates. Non-mortality complications were equally distributed between the two groups. Logistic regression analysis identified age, APACHE II score, and procedure count as significant predictors of mortality.

Conclusions: American Indians are presenting at notably younger ages compared to their White counterparts (62 vs 48 years old). Despite comparable outcomes between the groups, this highlights a distinct age-related gap within our American Indian/Alaska Native (AI/AN) population, underscoring the necessity for heightened care in this specific patient demographic.

52. Penetrating Intracranial Carotid Artery Trauma: Case Report of a Rare Injury

Wade Hopper, DO; Alessandra Spagnolia, MD; Alexander Drofa, MD; Andrew Terrell, MD

Medical Resident/Fellow/Transitional

Background: Carotid artery injury has an incidence of 0.2% in the National Trauma Data Bank. The true incidence of intracranial carotid injury is unknown but can be estimated at less than one in 1000 trauma-related inpatient admissions in America. Operatively managed penetrating carotid trauma has a mortality rate approaching 20%, and the selection of appropriate operative approach is not straightforward. We present a case of penetrating carotid trauma successfully managed via combined approach by neurosurgery and otolaryngology teams.

Case Presentation: A 74-year-old woman fell into a honeysuckle bush. She presented with a branch embedded in the left cheek and blindness of the right eye. Further workup revealed the branch had penetrated the maxillary bone, pierced the right optic nerve, and lodged near the intracranial portion of the right internal carotid artery. She underwent emergent operative intervention via right pterional craniotomy with microsurgery and endoscopic endonasal transsphenoidal surgery. The foreign body was removed and a traumatic carotid laceration was repaired. The patient recovered and was discharged to a skilled nursing facility on postoperative day 14.

Discussion: The management of facially penetrating foreign bodies begins with assessment for neurologic deficits and vascular injury. We recommend leaving such objects in place and not removing them until definitive imaging is obtained. We present an interesting case of penetrating trauma to the intracranial carotid artery in which a retained foreign body was removed with satisfactory patient outcome using the combined surgical approach of endonasal transsphenoidal endoscopy, craniotomy, and neck dissection.

54. Clinical Reasoning: Elderly male with isolated bitemporal hemianopsia

Ramiz Kirmani, Arman Saied, Edjay Hernandez, Dane Breker

Medical Resident/Fellow/Transitional

Background: Bitemporal hemianopsia often indicates optic chiasm pathology. While pituitary adenomas are common causes, traumatic chiasmopathy is rare, resulting from high-velocity closed-head injuries. Pituitary tumors press on the chiasm due to their proximity to the sella turcica, traumatic chiasmopathy leads to varying degrees of visual deficits. Diagnostic challenges include delayed presentations and underreporting. This case emphasizes the importance of a comprehensive diagnostic approach, especially after remote head trauma in patients with visual field deficits.

Case Presentation: An 81-year-old male presented to neuro-ophthalmology with incidental bitemporal hemianopsia noted during routine optometry follow-up for low-pressure glaucoma. The patient did not notice the visual field loss and had never had a prior visual field test. He had no history of pituitary tumors, brain radiation, or brain surgery. He had a history of amblyopia in the right eye due to exotropia since childhood but never underwent patching or strabismus surgery. In the 1970s, he was involved in a snowmobile

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collision, resulting in a loss of consciousness for an unspecified period. He did not recall any vision complaints after the crash. Physical examination showed reduced visual acuity and exotropia in the right eye. OCT RNFL showed generalized thinning of the RNFL. Perimetry demonstrated bitemporal visual deficits. MRI demonstrated optic chiasm bisection and encephalomalacia, consistent with prior trauma. Despite functional vision, imaging confirmed traumatic chiasmopathy discovered years after the event, which is a rare consequence of head injury. Considering the results of his imaging studies and the lack of functional impairment, we did not recommend any additional diagnostic testing and treatment.

Discussion: Traumatic chiasmopathy is a rare condition that affects around 3.2% of head trauma survivors with optic pathway injuries. Injuries range from minor tears to complete transection, often caused by high-velocity closed-head injuries. Visual field defects typically ma

56. Surgical Management of an Intentionally Ingested Vape Device Chronically Impacted within the Duodenum of an Adult Male

Audra L King, David R Velez, Mentor Ahmeti

Medical Resident/Fellow/Transitional

Most foreign body ingestion cases are accidental in the adult population. Intentional ingestion of foreign bodies in adults is typically associated with psychiatric disorders or developmental delay. In most cases, foreign bodies pass spontaneously through the gastrointestinal tract or can be managed endoscopically. Rarely, surgical intervention is indicated. We present a unique case of surgical management of an intentionally ingested vape device that was chronically impacted within the duodenum of an adult male present for six weeks before intervention without associated perforation. The foreign object was removed via exploratory laparotomy with duodenotomy and primary duodenorrhaphy with an uncomplicated postoperative course. There are only two previously reported cases of an ingested vape device. One was managed by observation, and the other was removed endoscopically. There are no previously reported cases of an ingested vape device that required surgical management.

58. CNS Blastomycosis presenting as a Space Occupying Lesion

Shubhangi Gupta, MD, Avish Nagpal, MD, MPH

Medical Resident/Fellow/Transitional

A 53-year-old male presented to the emergency room with tingling and numbness on his left jaw and left arm which had been occurring intermittently for the last 6 weeks. MRI of the head revealed a lobulated 1.6 X 1.6-centimeter mass in the right posterior frontal lobe. Patient underwent a brain biopsy and pathological analysis of the mass revealed presence of necrotizing granulomas. No tissue had been sent for microbiological studies. Testing for HIV and Mycobacterium tuberculosis specific interferon gamma release assay were negative. Since the patient resided in the upper Midwest region, consideration was given to the presence of blastomycosis of the central nervous system. Therefore, a fungal stain on the brain tissue was requested which revealed presence of broad-based budding yeast forms. Further testing revealed positive urine and serum Blastomyces antigens thereby establishing the diagnosis of CNS blastomycosis. Patient was started on treatment with liposomal amphotericin B and required Burr hole drainage. His symptoms improved rapidly following the procedure and he was transitioned over to oral antifungal therapy with voriconazole. This case highlights a rare presentation of a relatively rare geographically restricted disease. Diagnosis of Blastomycosis requires a high index of suspicion and knowledge of disease endemicity.

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60. Unique Papillary Thyroid Cancer (PTC) Metastasis to the Skin: a case report.

Mikale Kuntz, BS., Jeff Maddock, MD, Luke Roller, MD, Elena Rodgers-Rieger, MD.

Medical Student

Cutaneous metastasis of papillary thyroid cancer (PTC) is an unusual phenomenon with limited documented cases in medical literature. PTC is the most common of the thyroid cancers. Typically characterized by slow growth and a favorable prognosis, PTC is confined primarily to the thyroid gland and regional lymph nodes. However, in rare instances, aggressive behavior may lead to distant metastases, with the lungs and bones being the most affected sites. Nevertheless, the skin is an infrequent target for thyroid cancer dissemination. This case report presents a unique clinical scenario involving a patient diagnosed with papillary thyroid cancer who developed skin metastases. We aim to contribute to the growing body of knowledge concerning this uncommon manifestation of PTC by describing this patient's clinical presentation.

62. The effect of dual anti-platelet therapy on bleeding, transfusion and long-term outcomes after transcatheter aortic valve replacement (TAVR)

Ashley Matter, Greta Schwartz, Jacob Tupa, Dr. Hunter Row, Dr. Abe Sahmoun, Dr. Thomas A. Haldis, Dr. Cornelius Dyke

Medical Student

Introduction: Transcatheter aortic valve replacement (TAVR) is rapidly replacing surgical aortic valve replacement (SAVR) for patients with severe aortic stenosis due to its efficacy and safety profile. Complications exist however, especially vascular access complications which may require transfusion. While bleeding and transfusion negative impact outcomes after SAVR, the impact of bleeding events during TAVR less clear. Additionally, patients undergoing TAVR frequently have undergone percutaneous coronary interventions before their procedure and may be on anti-thrombotics at the time of their procedure.

Methods: All patients who underwent TAVR between 2012 and 2021 were reviewed (n=1184). Bleeding severity and TAVR outcomes were defined using Valve Academic Research Classification 3 (VARC). Anti-platelet and anti-thrombotic medications at the time of the procedure were documented. Exploratory data analysis was performed using summary statistics and bivariate analysis. Overall survival and survival estimates were calculated.

Results: Bleeding requiring transfusion during hospitalization occurred in 117 patients (9.9%), with 88 (6.3%) transfused within 24 hours of TAVR. Patients who were transfused were significantly more likely to be on clopidogrel (34.2% vs. 24.3%; p=.019) or Ticagrelor (5.1% vs. 1.8%; p=.031) along with aspirin before TAVR. Preoperative aspirin alone did not impact bleeding (9.6% v 9.9%; p=.216) but did improve long-term survival (median survival 7.7 vs 5.5 years p=.003). Preoperative use of clopidogrel and aspirin reduced long-term survival (median survival 5.1 vs 7.8 years; p<.001). VARC Class 3 bleeding reduced long-term survival compared to lesser bleeding scores (p<.001).

Conclusion: While dual anti-platelet therapy at the time of TAVR does not affect in-hospital and short-term outcomes, it does increase the risk of bleeding and transfusion following TAVR. However, medium-term survival was significantly reduced for patients who bled or were transfused. Therefore, consideration should be given to halting dual anti-platelet therapy at the time of TAVR. This shift may change clinical decision making regarding percutaneous interventions in patients before TAVR, who would likely require dual anti-platelet therapy.

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66. Community Health Aides/Practitioners: Increasing Access to Primary Care for American Indians/Alaska Natives

Danni Dearing, BS; S. Cristina Oancea, MS, MS, PhD

Medical Student

Purpose: American Indians/Alaska Natives (AI/ANs) continue to face many disparities of health, including decreased access to health care. Community Health Aides/Practitioners (CHA/Ps) are Tribal members who are trained to offer acute, emergency, and primary care services to their communities. CHA/Ps may play a significant role in increasing access to health care for AI/ANs but currently only exist in the state of Alaska. The purpose of this study was to determine the association between access to CHA/P services and a Having a Primary Care Provider (HPCP) among AI/AN.

Methods: This cross-sectional study used the 2018-2022 Behavioral Risk Factor Surveillance System data for AI/AN respondents in Alaska, Idaho, Oregon, and Washington (n=2,373). Weighted and adjusted logistic regression models were conducted overall and subgroup analyses were performed for significant effect modifiers. Confounders were selected based on previous literature.

Results: Overall, among AI/AN, having access to CHA/P services significantly increased the weighted and adjusted odds (WAO) of HPCP by 73% (95%CI:1.19–2.52) when compared to those without CHA/P access. Among AI/AN who were married/member of an unmarried couple, and never married, with CHA/P access, the WAO of HPCP were 127% (95%CI:1.28–4.04) and 133% (95%CI:1.21–4.47) significantly greater than among those without CHA/P access, respectively.

Conclusions: Study findings suggest that CHA/P access is significantly associated with increased access to primary care for AI/ANs, with the exception of separated, divorced or widowed individuals. Understanding this association can inform Tribal policy for Tribal health organizations considering incorporating CHA/P services into their programs.

68. A Retrospective Study on the use of Methenamine in the Prevention of Recurrent Urinary Tract Infections

Connor D. Griffin, Tze Shien Lo, MD.

Medical Student

Intro: Urinary Tract Infections (UTIs) are the most common cause of outpatient infections in the US, with prevalence increasing with age. Methenamine Hippurate (MH) is an FDA approved preventative strategy for recurrent UTIs that may be underutilized. MH is metabolized to formaldehyde in the urinary tract and exhibits nonspecific antimicrobial properties. Emerging antibiotic resistance is a global health concern prompting interest in non-antibiotic agents such as MH, but insufficient data exists to provide a viable alternative to the more widely used low dose antibiotic prophylaxis for recurrent UTIs. Acquired drug resistance does not appear to develop from the use of methenamine, as MH is an antiseptic. With an aging population in a time of increasing antibiotic resistance, more data is warranted on the efficacy of methenamine for UTI prevention.

Methods: Retrospective analysis of all patients from the Fargo VA who had taken MH for a minimum of 6 months between May 15 2013 and May 15 2023 was completed. A UTI episode was defined as a clinician-reported symptomatic UTI that was treated with a discrete course of antibiotics. The end of a UTI episode was defined as occurring 14 days after the last dose of therapeutic antibiotics, if symptoms/treatment persisted past 14 days it was counted as the same episode. UTI history while taking MH was compared to UTI history immediately preceding MH initiation for the same duration of time. Results were analyzed using the PSPP statistical software program.

Results: 55 patient records were initially reviewed. 32 charts were analyzed after assessing exclusion criteria. There was a statistically significant difference for number of patients with at least one UTI pre-MH: 30; post-MH: 17, (p<0.05), as well as for males only, pre-MH: 27; post-MH: 15, (p<0.05). For number of UTI episodes, there was a statistically significant difference before and after MH initiation for the entire

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cohort pre-MH: 84; post-MH: 34, ($p < 0.05$), and for males only pre-MH: 77; post-MH: 24, ($p < 0.05$). The number of females with at least one UTI and number of UTI episodes for females were not statistically significant.

Conclusion: The study demonstrates a reduction in overall episodes of UTIs while taking MH for recurrent UTI prophylaxis. In combination with an aging population and increasing rates of antibiotic resistance, consideration should be given to MH for prophylaxis of recurrent UTIs. However, more data is needed, and collection is ongoing.

70. Factors Associated between Younger and Elderly Homeless Adult Visits to United States Emergency Department

Matthew Cohoe, B.S., Jackson Wilson, B.S., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: Researchers have noted the increasing average age of homeless adults, with the elderly homeless population projected to triple in the next decade. This could heavily impact emergency department services, often the homeless population's only source of healthcare. The aim of this study was to determine the factors associated with elderly versus younger adults homeless visits to U.S. emergency departments.

Method: We conducted a retrospective analysis of homeless adults utilizing the 2012-21 National Hospital Ambulatory Care Survey Emergency Department datasets. We compared demographic and clinical factors of younger to elderly homeless adult ED visits.

Results: Of the estimated 1 billion adult U.S. ED visits from 2012-21, 1.1% were by homeless individuals. Of these homeless visits, 61.6% were 18-49 years old and 38.3% were 50 years or older. There was no association between homeless age category and gender ($p = .151$), race ($p = .079$), insurance ($p = .175$), or region ($p = .072$).

Elderly homeless visits had a higher rate of arriving by ambulance (50.8% vs. 39.8%, $p = .002$) and having procedures provided (43.0% vs. 35.7%, $p = .011$). There was no association between homeless age and time of visit ($p = .287$), weekend visits ($p = .668$), wait time ($p = .570$), length of visit ($p = .318$), triage level ($p = .788$), or diagnostic services ($p = .067$).

There was no difference in the rate of being given medication between elderly and younger homeless visits ($p = .350$), although elderly received a higher number of medications (2.6 vs 2.1, $p = .001$). Elderly homeless visits had lower rates of having psychiatric diagnosis (37.8% vs. 52.9%, $p = .001$) and substance abuse diagnosis (16.9% vs. 26.6%, $p = .001$). There was no association between homeless age and injury diagnosis ($p = .141$). Elderly homeless visits had a higher rate of admission (17.4% vs. 11.5%, $p = .024$). However, once admitted there was no difference in the length of stay ($p = .123$).

Conclusions: We found elderly homeless had higher treatment rates in terms of procedures, total medications given, and admission, although the age groups had similar rates of acuity, work up, and diagnostic services in the ED. Furthermore, elderly homeless had a lower rate of psychiatric and substance abuse diagnoses. Future studies may be directed towards defining the specific diagnoses and treatments involved in elderly visits. As the average homeless age increases, hospitals should anticipate changing needs among this population.

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72. Utility of Incorporating Lower Extremity Ultrasound in Initial Venous Thromboembolism Workup in Adults with Elevated D-Dimer and Negative CT Pulmonary Angiogram

Grace Lavandowska, B.S., B.A., April Hagemeister, B.S., Logan Schmaltz, M.D., Venkatkiran Kanchustambham, M.D.

Medical Student

Purpose: An estimated 900,000 people are affected by deep venous thrombosis (DVT) and pulmonary embolism (PE) in the U.S. each year. The current guidelines for venous thromboembolism (VTE) diagnosis recommend obtaining CTPA imaging when there is a high suspicion for PEs. CTPA has an 86% sensitivity for detecting PEs. A study in 2016 revealed many patients will have a positive CTPA study after an initial negative CTPA. Current guidelines do not recommend obtaining a lower extremity venous duplex ultrasound (LEVDU) for VTE workup unless there are abnormal chest radiograph findings and a contraindication to CTPA or if the patient presents with lower extremity findings. Our study aims to explore the utility of incorporating LEVDU during the initial VTE workup in adults aged 18-50 years who presents with elevated D-dimer and negative CTPA imaging. Many patients die from VTE each year therefore earlier detection and intervention could reduce mortality from complications of VTEs.

Methods: A retrospective chart review was performed with inclusion criteria of patients greater than 18 years old who had an elevated D-dimer greater than 0.5mg/L and negative CTPA in 2017, and had venous dopplers of left, right, or bilateral lower extremities within 12 months. 2017 was chosen since it was a time prior to the Sars-CoV-2 pandemic and this virus is known to increase the risk of blood clots and vasculitides. Exclusion criteria included patients less than 18 or over 50 years old, pregnant women, patients with cancer history, and patients on anticoagulation.

Results: After chart review, 129 patients aged 18-50 years met full inclusion criteria. Of the 129 patients, 9 patients were screened with LEVDU at the index visit—all negative for DVT. Five patients had a follow-up CTPA and LEVDU within 12 months of those zero had a DVT or PE. There were positive findings in patients over 50 years, however, age itself is a risk factor, which was an exclusion criterion. Statistical analysis was not run due to no patients having a positive pulmonary embolism on follow-up.

Conclusions: There were no VTEs within a 12-month period occurring in those with an initial elevated D-dimer and negative CTPA. Incorporating LEVDU during initial presentation is therefore unlikely to improve morbidity or mortality complications of VTEs. This study supports current VTE screening guidelines and practices as appropriate and no additional testing during the initial presentation is indicated.

74. Impact of Completing Away Rotations During Dermatology Residency on the Mohs Fellowship Match

Claire Diede BS, David R Carr MD MPH, Kathryn T Shahwan MD

Medical Student

The Micrographic Surgery and Dermatologic Oncology (MSDO) fellowship has match rates ranging from 54-61% since 2017. Dermatology residents applying for MSDO fellowship often complete away rotations to learn different surgical techniques, explore programs, and demonstrate their candidacy. A 2019 survey of MSDO program directors (PDs) revealed that interpersonal skills, like teamwork and work ethic, are regarded most highly, and away rotations provide opportunities to demonstrate these skills. However, away rotations themselves were rated of lower importance. This study aimed to further explore the impact of completing Mohs away rotations on the MSDO fellowship match. Individuals who applied to MSDO fellowship programs through sfmatch between 2017-2022 were eligible. An online survey asking about gender, degrees, residency region, home fellowship program, publications, number of MSDO programs applied to, away rotations and their attributes, and match outcome was created using SurveyMonkey. The survey was sent out to the American College of Mohs Surgery and Association of Professors of Dermatology email listservs and advertised on social media. Ninety-nine subjects completed the survey; 56% were female and 93% were MDs. In 2022, 23% of subjects applied, 18% in 2021, 11% in 2020, 19%

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in 2019, and 14% in 2018 and 2017. Most applicants were from programs in the Midwest (34%) or Northeast (33%), and 48% had a home fellowship program. The majority matched (73%), with 18% matching at their home program and 32% matching at a program they rotated with. Sixty-nine subjects (70%) completed Mohs away rotations, with 16% completing 1, 23% completing 2, and 30% completing 3 or more. Most away rotations were 1 week long (64%), occurred during the final year of residency (55%), were unfunded (78%), and were limited to shadowing (73%). Chi-squared tests revealed that gender, medical degree, residency region, number of publications, number of programs applied to, completion of away rotations, and number of away rotations had no significant association with match outcome. Having a home fellowship program was the only factor that influenced match success ($p=0.001$). While 32% of participants matched at a program they rotated with (whereas only 18% matched at their home program), there was no significant relationship between completing away rotations and the likelihood of matching. Limitations include the survey design and the small sample size, inhibiting multivariate analysis.

76. Comparing Universal and Selective Pediatric Lipid Screening: Multifaceted interventions, Unexpected Findings, and Broader Implications for Familial Hypercholesterolemia Management

Noah L. Antes, B.S., Abe E. Sahmoun, Ph.D., Carlos D. Miranda, M.D.

Medical Student

Purpose: Familial hypercholesterolemia (FH) stands as the most prevalent life-threatening genetic disorder, impacting approximately 1 in 250 individuals worldwide. The guidelines for universal lipid screening in patients ages 9 to 11 years old between the United States Preventative Services Task Force (USPSTF) and other prominent institutions including the Centers for Disease Control (CDC), American Academy of Pediatrics (AAP), and the National Heart, Lung, and Blood Institute (NHLBI) contradict each other based on current evidence. The aim of our study was to compare universal and selective pediatric lipid screening in the upper midwest region of the U.S.

Methods: In a Midwest hospital system in the Fargo, ND, we implemented several interventions to increase lipid screening compliance by educating pediatricians, utilizing best practice advisory tool on the electronic health record, developing a protocol for the interpretation, management of FH, and creating a lipid clinic for persistent and or high-risk dyslipidemia. Children between the ages 9 to 11 and 17 to 18 years old were classified as universal screening group and compared to children between ages of 2 to 8 and 12 to 16 years old were classified as the selective screening group according to the guidelines for universal lipid screening. The diagnosis of FH was ascertained based off the US (MEDPED) criteria. We compared universal and selective screening using Chi-square tests for categorical variables and Wilcoxon signed-rank test for non-normally distributed or t-test for continuous variables. All statistical tests were two-tailed with p -value ≤ 0.05 considered to be significant. Statistics were performed using SAS software V9.4, SAS Institute, Cary, NC, USA. This study was approved by Sanford Health IRB.

Results: 164 patients diagnosed with dyslipidemia were analyzed. The majority 84 (51%) was classified as selective lipid screening group. 46 (28%) met criteria for a clinical diagnosis of FH. When comparing universal and selective lipid screening, we found no significant difference in patients meeting US (MEDPED) criteria (52% vs. 48%; $p=0.879$). There was no difference between patients meeting criteria for FH diagnosis within the universal and selective screening groups (28% vs. 29%) in selective screening group.

Conclusions: The comparable results between the universal and selective lipid screening groups suggests the importance of implementing both screening practices in the pediatric population.

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78. Analyzing Fall Risk Among Older Adults, with a Focus on Polypharmacy

Christianah Jemiyo, Junguk Hur, Donald Jurivich, Dawn Denny, Glenda Lindseth, and Zahra Afghah – UND, Michael Johnson, Jorin Backer and Zachary Downs - Aspire Clinical Intelligence

Visiting Scholar

The study investigated factors contributing to falls among older adults in a nursing care facility across four time periods, centered around June 23, 2023. Two analyses were conducted: falls in the preceding and following 3 and 6 months. The aim was to identify variables influencing falls, including demographics, medication count, SLUMS score, and health status. Methods involved categorizing falls into fallers and non-fallers, followed by statistical analyses such as chi-square tests, ANOVA, correlation, univariate & multivariate binary logistic regression, and the application of machine learning algorithms, including Support Vector Machines (SVM), Random Forest, and XGBoost, to explore associations. Results from 3,798 participants showed significant associations between falls and various factors. No gender-based differences were found in falls, while age-based differences were absent. Correlation analysis revealed relationships between weight, number of medications, and falls. Falls within the last 3 and 6 months were associated with product line, polypharmacy, and age, with antidepressant usage also impacting falls in the last 6 months. Falls in the next 3 and 6 months were associated with product line, SLUMS score, age, and antidepressant use. The study underscores the importance of product line, number of medications, and antidepressant use in predicting falls among elderly individuals, aiding in the development of targeted interventions to mitigate fall risk in various senior living environments. Additionally, the integration of advanced machine learning techniques enhances our understanding of the complex interplay between diverse factors contributing to falls, paving the way for more accurate risk assessment and intervention strategies.

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Video Presentations

156. Incidence and Risk Factors of Brain Metastasis in HER-2 Positive Primary Breast Cancer: A Retrospective Analysis

Hallie Thompson, MD, PGY-3; Anu Gaba, MD; and Abe E Sahmoun, Ph.D

Medical Resident/Fellow/Transitional

Introduction: Breast cancer (BC) is the most prevalent malignancy and the second leading cause of cancer-related death among women worldwide. Despite the progress in early diagnosis through screening and effective treatment, BC recurrence and metastasis remain a significant risk for lower survival. Brain metastasis (BM) occurs in nearly one-third of HER-2+ patients. BM is associated with both poor quality of life and prognosis. The aim of this study was to identify modifiable risk factors associated with increased risk for developing BM in HER-2+ primary BC.

Methods: This was a retrospective study that examined demographics, clinical, and treatments variables in HER-2+ primary BC women. Bivariate analyses were conducted comparing women with HER-2+ BC who developed BM to women with metastasis to other organs using t-test for continuous variables and Chi-square or Fisher's exact tests for categorical variables. All significance tests were two-sided and p-value < 0.05 was considered significant.

Results: 42 women diagnosed with HER-2+ primary BC were analyzed. 27 (64%) of women developed BM. The mean age (\pm SD) was 51.5 (12.9) years for women with BM and 51.3 (14.1) years for no BM ($p=0.96$). There was no association between race and BM occurrence (White: 64% vs. other: 67%; $p=1.00$). The median tumor size (IQR) was 18.5 (12-31) mm for women with BM and 27.5 (13-50) mm for no BM ($p=0.26$). There were no significant differences in cancer histology, hormonal receptors positives (ER+/PR+), Lymph nodes involvement, or BC management. Liver metastasis was associated with increased risk of brain metastasis (82% vs. 18%; $p=0.04$). The estimated median time to BM was 1.4 (95% CI: 0.9-2.7) years. Almost half 18 (42.9%) of women died. The estimated median time to death was 4.3 (95% CI: 2.2-5.2) years.

Conclusions: This descriptive small study found that diagnosis of liver metastasis was associated with increased risk of BM. Brain MRI use in women diagnosed with liver metastasis could be beneficial to cancer. Future studies should use the National Cancer Database to have the adequate power to detect other risk factors for developing BM. Lastly, examining differences in pathological molecular biology by comparing the differences in the breast primary lesions of patients with BM and those without BM could be helpful in predicting the occurrence of BM.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

157. Acute Colonic Pseudo-Obstruction: A Complication of Living Donor Nephrectomy That Has Not Yet Been Described in the Literature

Riley Moore

Medical Resident/Fellow/Transitional

Acute colonic pseudo-obstruction (ACPO) is a rare condition in which the colon is found to be dilated in the absence of obstruction. The exact pathophysiologic mechanism of ACPO is unknown, but it is thought to be due to a decrease in parasympathetic tone from the sacral nerve plexus. This leads to an atonic distal colon and functional obstruction. Diagnosis of ACPO is based on history, physical exam and imaging. Patients will often present with symptoms of obstruction, abdominal distension and have a history of recent surgical procedure or take predisposing medications. In this case report we describe a case of a healthy 46-year-old male who was diagnosed with ACPO after elective donor nephrectomy. This is a case that has not yet been described in the literature.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

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158. Post-Graduation Outcomes in a Dedicated Rural Surgery Training Program; a Program Review

Valerie J Pendleton, DO, Stefan Johnson, MD, FACS

Medical Resident/Fellow/Transitional

Purpose: Recognizing the generational shift in surgical education with an increasing emphasis on fellowship training, the purpose of this study is to review post-training outcomes for graduates participating in a surgery residency program with a dedicated rural surgery track.

Methods: This study reviewed rural surgery residency outcomes including post-training practice location, geographic setting (rural vs. urban vs. suburban), and whether graduates pursued fellowship for additional specialty training. This study was performed at the University of North Dakota General Surgery Residency, in Grand Forks, North Dakota.

Results: Twenty-six general surgery residents were reviewed that had completed their training from 2013-2019, nine of whom were assigned to a dedicated rural surgery track versus seventeen who were designated to a standard surgery track. Notably, 100% of rural track residents directly entered practice (either metropolitan or rural) after completing their general surgery residency, whereas roughly 59% of standard track residents pursued general surgery practice and approximately 41% of whom sought out additional fellowship training. Among rural track graduates who directly entered practice after the completion of their training, 67% initially pursued rural practice locations versus 29% of standard track graduates who similarly entered rural practice at the end of their training.

Conclusions: Opportunities in surgical residency with an emphasis on rural surgery training may facilitate a more robust pipeline from residency to independent practice, particularly in rural versus urban communities

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

159. Infrequent Malignant Thyroid Pathologies

Jackson (John) Walsh, MD; Jessica Otten, ARNP; Erin Follman, MD; Michael Traynor, MD

Medical Resident/Fellow/Transitional

Background: Thyroid cancers make up 2-4% of cancers in the US, with an estimated 43,000 new diagnoses in 2023. Classically, we talk about the most common thyroid malignancies: Papillary, Follicular, Hürthle cell, Medullary, and Anaplastic. Papillary Thyroid cancer makes up the vast majority of these cancers (70-80%), with the remaining types making up the remaining >95% of all thyroid cancers. What is less well defined is the incidence of less common pathologies seen after thyroidectomy. Thyroid lymphoma has been documented as an infrequent thyroid malignancy, but other studies investigating the prevalence of these infrequent pathologies is lacking.

Methods: For this study, a chart review looking at a single surgeon's pathology reports from thyroidectomies & lobectomies performed between 2000-2020. More than 1600 charts have been reviewed, with another several hundred still to be reviewed. These pathology reports were separated into benign & malignant pathologies and the malignant pathologies were then further subdivided into the various cancer types.

Results: As expected, the vast majority (97%) of the malignant thyroid pathologies were in line with the expected frequencies of thyroid cancers. Papillary carcinoma made up the majority of thyroid malignancies (87%), followed by Follicular/Hürthle (8%), Medullary (1%), and Anaplastic (1%). Only 18 of the 615 malignant pathologies did not fit within these classic cancer types.

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Conclusion: A wide variety of infrequent thyroid malignant pathologies were noted: Adenocarcinoma (likely lung primary), neuroendocrine tumor, Squamous cell carcinoma, Colorectal adenocarcinoma, Renal clear cell, Hyalinizing trabecular tumor, oncocytoma (newer studies considering this benign), and paraganglioma. Of the infrequent malignant pathologies, Lymphoma was the most common with an incidence of 7, the rest having only 1 or 2 occurrences in our study.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

160. Beyond The Norm: A Case Report of Early Onset Lung Adenocarcinoma

William Litchfield MD, Shabbir Haiderbhai MD, Arman Quraishi MD, Nicole Sinclair and Riley Clark MD

Medical Resident/Fellow/Transitional

Lung adenocarcinoma, a subset of non-small cell lung cancer (NSCLC), predominantly affects older, male smokers and is the most prevalent primary lung cancer in the United States. Typically diagnosed around the age of 70, it is uncommon in young individuals. Here, we present a compelling case of a 20-year-old female who presented with multiple occlusive right upper extremity deep vein thromboses accompanied by pleural and pericardial effusions. Imaging revealed a right upper lung mass, and subsequent fluorodeoxyglucose (FDG) positron emission tomography demonstrated avid metastatic disease. Biopsy of the lesion confirmed adenocarcinoma, exhibiting positive immunohistochemical (IHT) stains for Pankeratin, CK-7, TTF01, and Napsin-A, supporting the diagnosis. Biomarker and immunohistochemical staining indicated positivity for ALK and PD-L1. The patient was diagnosed with stage IVa lung adenocarcinoma and initiated on Carboplatin and Pemetrexed, with a tentative treatment plan of four cycles.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

161. A unusual case of infective Endocarditis Disease caused by *Granulicatella adiacens*

Derek Anderson, S.Nwabia, Y.Dorji, S.Singhal, T.Lo

Medical Resident/Fellow/Transitional

Infective Endocarditis is an uncommon life-threatening disease that has strong risk factors associated with it such as cardiac valvular abnormalities and implanted cardiac devices. Endocarditis is the inflammation of the inner layer of the heart, usually involving the heart valves, both native and prosthetic. IE is most commonly caused by gram-positive streptococci, staphylococci, and enterococci infection. These groups of organisms account for 80% to 90% of all cases throughout the world. Additionally, IE can be caused by *G. adiacens* which is a nutritionally variant streptococcus.

Nutritionally variant species (NVS) were first described in 1961 as fastidious gram-positive bacteria that grew as satellite colonies around other bacteria. *G. adiacens* was formerly known as *Abiotrophia adiacens* and is seen as the normal flora of the human mouth, genital and intestinal tracts. *Abiotrophia* and *Granulicatella* cause sepsis and bacteremia and are causes of 5-6% of infective endocarditis. Despite being a part of the oral, gastrointestinal, and urogenital commensal flora, *G. adiacens* is rarely implicated in infections due to their difficult isolation and differentiation techniques as compared to other streptococci.

Case Presentation:

87-year-old patient with past medical history of coronary artery disease s/p CABG, sick sinus syndrome s/p pacemaker, aortic stenosis, carotid artery stenosis s/p CEA, HFpEF and lacunar CVA who was admitted to the hospital with shortness of breath and bilateral lower extremity swelling. Patient was diagnosed with acute on chronic diastolic heart failure and underwent imaging that showed bilateral pleural effusions. He underwent right-sided thoracentesis and IV diuresis with improvement in his respiratory status and initial echocardiogram showed ejection fraction of 55-60% with grade 2 diastolic dysfunction, moderate/severe aortic stenosis. During his hospitalization and subsequent diuresis he developed fever and blood cultures were positive for *G. adiacens*. Due to patient's implanted pacemaker there was concern he may have

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endocarditis and TEE showed vegetations on the anterior/posterior portion of the mitral valve as well as RV pacemaker lead. Pt was treated with 6 weeks of IV vancomycin and subsequently with Amoxicillin suppressive therapy indefinitely and leave the pacemaker in place.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

162. Factors Associated with Hospitalization Among Hypotension Visits to United States Emergency Departments, 2012-21

Joel Zimmerman, B.S., Dylan Wrede, B.S., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: The purpose of the study was to determine factors associated with hospitalization of adult visits with hypotension to United States emergency departments.

Method: We retrospectively analyzed adults presenting with hypotension to the emergency department utilizing the 2012-2021 National Hospital Ambulatory Care Survey Emergency Department datasets.

Results: Of the estimated 998 million adult visits to U.S. EDs from 2012-21, 7% had hypotension. Of these 26% were hospitalized. Hospitalized visits were more likely to be male (42.1% vs 33.0%, $p=.001$), older (68.4 vs 50.4 years, $p=.001$), White (81.0% vs 75.3%, $p=.001$), and urban (88.0% vs 82.2%, $p=.001$).

Hospitalized visits had shorter wait times (32.4 vs 37.7mins; $p=.015$) with higher rates of immediate triage (45.6% vs 14.1%; $p=.001$) and hypoxemia (7.7% vs 2.7%; $p=.001$). They were less likely to have a normal pulse (70.8% vs 80.6%; $p=.001$), respiratory rate (54.7% vs 73.3%; $p=.001$), and severe pain (29.1% vs 41.8%; $p=.001$).

Those hospitalized had higher rates of concurrent congestive heart failure exacerbation (8.6% vs 2.6%; $p=.001$) and shock (3.7% vs 0.1%; $p=.001$) and comorbidities of hypertension (63.5% vs 30.3%; $p=.001$), diabetes (30.9% vs 14.9%; $p=.001$), congestive heart failure (22.3% vs 6.6%; $p=.001$), cerebrovascular accident/stroke (11.9% vs 4.8%; $p=.001$), MI, CAD, or ischemic heart disease (24.6% vs 9.3%; $p=.001$), and COPD (20.5% vs 7.8%; $p=.001$).

Hospitalized visits had higher rates ($p=.001$ for all) of laboratory tests, including basic metabolic panel (27.5% vs 12.0%), comprehensive metabolic panel (67.8% vs 39.1%), complete blood panel (86.42% vs 50.6%), and brain natriuretic peptide (15.6% vs 3.8%). They were also more likely ($p=.001$ for all) to receive imaging (x-ray, 66.5% vs 37.6%), CT scan (40.5% vs 21.8%), and MRI (1.8% vs 0.9%), ECGs (65.2% vs 27.4%), and cardiac monitoring (31.6% vs 10.3%).

Medication rates were higher ($p=.001$ for all) for hospitalized patients for diuretics (10.5% vs 2.6%), antiplatelets (12.1% vs 4.9%), anticoagulants (11.5% vs 4.9%), ACE inhibitors (2.4% vs 1.2%; $p=.005$), beta-blockers (2.9% vs 2.6%), calcium channel blockers (4.3% vs 1.9%), vasodilators (5.7% vs 1.5%), vasopressors (4.6% vs 1.0%), inotropes (1.5% vs 0.4%).

Conclusion: We found that 7% of ED visits presented with hypotension, with 26% being hospitalized. Hospitalized hypotensive patients had significantly more comorbidities and required significantly more ED management.

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163. Rural Residence, A Risk Factor of Failure in Smoking Cessation

Sarah DiDonna, B.S., James R. Beal, Ph.D., & Abe E. Sahmoun, Ph.D.

Medical Student

Purpose: Smoking is a leading risk factor for negative health outcomes with cessation being an important social and clinical preventative measure. The purpose of this study was to assess the association between rural and urban residence in smoking cessation among United States adults.

Method: We conducted a retrospective analysis of adult smokers utilizing the 2022 U.S. Behavioral Risk Factor Surveillance System (BRFSS) dataset. We compared demographic factors and smoking cessation between individuals in rural or urban settings. SAS 9.4 was used to analyze data using Chi-square and t-tests. All significance tests were two-sided, P-value ≤ 0.05 for significance. UND IRB approved this study.

Results: Of the estimated 10 million U.S. adults in 2022, 91.7% reported urban residence and 8.3% rural. Rural residents reported higher rates of being 65+ years (20.3% vs. 16.6%, $P=0.016$), White (82.9% vs. 65.4%, $P=0.000$), married (41.5% vs. 36.5%, $P=0.007$), not graduating high school (22.0% vs. 18.6%, $P=0.000$) and being in fair-poor health (33.6% vs. 28.1%, $P=0.003$). There was no association between residence and gender ($P=0.683$) and insurance ($P=0.102$).

Overall, 51.2% of smokers quit smoking. Rural smokers had a lower cessation rate (44.5% vs. 51.8%, $P=0.000$). Rural smokers had smoked significantly longer (32.9 vs. 28.8 years, $P=0.000$) and had a higher rate of COPD, emphysema, or chronic bronchitis than urban smokers (22.2% vs. 17.3%, $P=0.003$). Among smokers that stopped smoking in the last 12 months, rural smokers had been smoking longer (31.0 vs. 27.4 years, $P=0.000$). There was no association between residence and having a personal doctor ($P=0.897$), asthma ($P=0.338$), and cancer ($P=0.322$).

Conclusions: We found only slightly more urban than rural smokers quit smoking in 2022. Rural smokers had a lower cessation rate compared to their urban counterparts. However, rural smokers were older, less educated, and had been smoking longer than urban smokers. These are important findings as no previous studies have illuminated the cessation discrepancy between rural and urban smokers.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

164. Treatment of Common Skin Diseases by Primary Care Physicians and Dermatologists

Brailyn Weber, B.S., **Chloe Kaelberer, B.S.**, Abe E Sahmoun, Ph.D., James R Beal, Ph.D.

Medical Student

Purpose: Skin diseases have a profound impact on individuals' quality of life. The aim of this study was to compare the treatment of common skin diseases among primary care physicians and dermatologists in US ambulatory clinics, with the goal of identifying treatment discrepancies across specialties.

Methods: We conducted a retrospective review of adult visits for common skin diseases (atopic dermatitis, contact dermatitis, and psoriasis) utilizing the 2011-16 National Ambulatory Medical Care Survey (NAMCS) datasets. We compared the prescribing patterns for topical steroids, anti-infectives, and other topical medications between physicians specializing in family medicine (FM), internal medicine (IM), and dermatology.

Results: Of the estimated 1.8 billion adult ambulatory care visits from 2011-2016, 2.5% were for common skin diseases. Of these visits, 32% were seen by FM, 15% by IM, and 51% by dermatology. FM and IM visits were less likely to have private insurance coverage (57.8% and 61.2% vs. 74.2%, $p=0.001$), be of white race (85.1% and 75.1% vs. 90.1%, $p=0.001$), and occur in an urban setting (86.6% and 91.1% vs. 96.6%, $p=0.001$) than dermatology visits. FM and IM visits had a higher rate of encountering new problems (52.2% and 50.7% vs. 35.7%, $p=0.001$) compared to dermatology visits. There was no association between physician specialty and patient sex ($p=0.703$), patient age ($p=0.113$), and geographical region ($p=0.456$).

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FM and IM physicians exhibited lower rates of conducting skin examinations compared to dermatologists (44.8% and 43.5% vs. 87.0%, $p=.001$). FM physicians had lower rates of prescribing topical steroids compared to IM physicians and dermatologists (36.3% vs. 44.2% and 49.0%, $p=.007$). Primary care physicians were less likely to prescribe anti-infectives (6.7% and 3.8% vs. 11.9%, $p=.001$) and other topical medications (7.2% and 7.8% vs. 17.8%, $p=.001$) compared to dermatologists.

Conclusions: Common skin diseases are a substantial burden in ambulatory care clinics, accounting for 2.5% of adult visits. Primary care physicians play a significant role in managing these conditions, with distinct prescribing patterns compared to dermatologists. Notably, primary care physicians were less likely to prescribe a wide array of topical medications and were also less likely to conduct skin examinations compared to dermatologists. These discrepancies highlight the need for standardized treatment approaches across specialties to optimize patient care.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

165. Association between race and use of antidepressant medication during pregnancy

Nicole A. Sinclair, Danielle R. O'Hare, Abe E. Sahmoun, and James R. Beal

Medical Student

Purpose: Mental illness during pregnancy is more likely to have adverse outcomes on Black and Hispanic women compared to White women with a decreased likelihood of receiving mental health services. The purpose of this study was to determine the association between race and antidepressant use during pregnancy.

Method: We conducted a retrospective analysis of visits by adult (18+ years) pregnant women using the 2012-19 National Ambulatory Medical Care Survey. We compared antidepressant use during pregnancy by race (White, Black and Other). Antidepressant use included comparisons any type, specific classes of SSRIs, and miscellaneous (including 5-hydroxytryptophan).

Results: Of the estimated 238 million visits involving adult pregnant women in US from 2012-19, 76.9% were White, 14.3%-Black, and 8.9%-Other. Overall, 7.6% were on antidepressants. White and Other women were more likely to have private insurance than Black women (60.1% and 75.7% vs. 34.7%, $p=.001$). Other pregnant women were older (31.2 vs. 29.6 and 28.3 years, $p=.001$) and be in the West region (61.2% and 32.5% vs. 12.1%, $p=.001$) than White and Black women. Other and Black women were more likely to be in a Metropolitan Statistical Area than White (97.6% and 94.4% vs. 91.6%, $p=.038$). There was no association between race and patient's primary care physician ($p=.715$), new patient ($p=.267$), referred patient ($p=.711$), solo practice ($p=.236$), or practice owner ($p=.432$).

There was no association between race and comorbidities of depression ($p=.413$) or alcohol/substance abuse ($p=.437$). White women received a higher rate of mental health counseling (0.6% and 0.0% vs. 0.0%, $p=.001$), while Black women were more likely to be returned to referring physician (4.3% vs. 1.2% and 0.7%, $p=.038$). There was no association between race and return for a visit ($p=.905$) or being referred to a new physician ($p=.067$).

There was no association between race and antidepressant use during pregnancy (White-8.0%, Black-6.5% and Other-5.8%, $p=0.463$). White women were more likely to be prescribed SSRI antidepressants (3.2% and 0.8% vs. 1.2%, $p=.025$), while there was no difference in use of miscellaneous antidepressants (White-4.5%, Black-5.4% and Other-4.7%, $p=0.819$).

Conclusions: We found no difference in antidepressant use during pregnancy by race. However, White women had higher rates of SSRI antidepressants. Further studies should assess if pregnant women have chronic and pregnancy-related depression.

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166. Association Between Race and Management of Type 2 Diabetes Mellitus in United States Clinics, 2014-19

Anyamaria R. Edwards B.S., Mark Raymond, B.S., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: This aim of this study was to determine the association between race and management of type II diabetes mellitus (T2DM) adult clinic visits in the United States.

Method: We conducted a retrospective analysis of adult T2DM visits using the 2014-2019 National Ambulatory Medical Care Survey datasets. We compared T2DM management (preventative screenings, lab. tests, counseling, medications) by race.

Results: Of the estimated 821 billion adult visits from 2014-2019, 14.1% had T2DM. Of T2DM visits, 75.9% were White, 18.9%-Black, and 5.2%-Other. Black and Other visits were more likely to be female (62.4% and 67.2% vs patients (47.7%, $p=.003$) and be in urban areas (94.0% and 97.5% vs. 87.3%, $p=.016$). Black and Other visits had lower rates of private insurance (62.1% and 66.6% vs. 72.9%, ($p=0.023$) and being in the Midwest (8.3% and 10.2% vs. 27.6%, $p=.001$). There was no association between race and age ($p=.532$), patient's primary care physician ($p=.454$), new patient ($p=.075$), visits in 12 months ($p=.064$), solo practice ($p=.655$), or practice owner ($p=.365$).

Clinically, 67.6% of visits had A1c checked and 56.9% had A1c in control ($>7\%$) in the last 12 months. There was no association between race and rates of having A1c checked ($p=.153$) or A1c in control ($p=.092$) in the last 12 months. Black visits were more likely to have their blood pressure checked in the last 12 months (99.7% vs 96.5% and 97.3%, $p=.001$). There difference among race and rates of having fasting blood glucose ($p=.875$), serum creatinine ($p=.844$), or total cholesterol ($p=.798$) in the last 12 months. Black and White visits had lower rates of obesity than Others (30.7% and 29.3% vs. 6.8%, $p=.014$). Rates were similar for comorbidities of smoking ($p=.142$), hyperlipidemia ($p=.572$), and hypertension ($p=.073$).

We found similar rates among races of preventative screenings of foot ($p=.182$), eye ($p=.285$), and neurologic exams ($p=.972$). Also, rates were similar for counseling for nutrition ($p=.190$), exercise ($p=.482$), weight loss ($p=.236$), and diabetes education ($p=.168$). Finally, rates of antidiabetic medication utilizing among the races were similar for any antidiabetic agent ($p=.329$), and specific classes: Sulfonylureas ($p=.329$), Biguanides ($p=.815$), Insulin ($p=.868$).

Conclusions: We found that management of T2DM was similar across races in U.S. ambulatory care clinics from 2014-19. This is an improvement from previous studies that found racial disparities in A1c control and eye exams.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

167. The Association between Depression and Length of Hospitalization for Ischemic Events in United States Emergency Departments

Joshua Kaelberer , B.S., Maria Tibesar, B.S., Abe E Sahmoun, Ph.D., James R Beal, Ph.D.

Medical Student

Purpose: Previous studies suggest mental illness can affect a patients hospital course, including an increased length of stay. The purpose of this study was to determine the association between depression and the length of hospitalization for ischemic event visits to emergency department in the United States.

Method: We conducted a retrospective review of adult ischemic event visits utilizing the 2014-21 National Hospital Ambulatory Medical Care Survey datasets. We compared the length of stay between those with and without depression among hospitalized ischemic event visits to U.S. EDs. Depression included affective disorders and major depressive disorders.

Results: Of the estimated 8.5 million adult visits for ischemic events to U.S. EDs from 2014-21, 65.2% or 5.6 million were hospitalized. Overall, those hospitalized for ischemic events were on average 69 years old,

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White (76.6%), and did not have private insurance (64.5%). Furthermore, 8.7% had depression. Those admitted with depression were more likely to be female than those not admitted (65.7% vs. 41.1%, $p=.023$). There was no association depression status and age ($p=.479$), race ($p=.218$) insurance ($p=.199$).

Those admitted with depression had higher rates of history of CVA/TIAs (79.3% vs. 56.4%, $p=.026$), hypertension (96.5% vs. 70.1%, $p=.001$), and total comorbidity (6.0 vs. 3.5, $p=.001$). There was no association depression status and other ischemic event risk factors of CAD/MI ($p=.635$), hyperlipidemia ($p=.131$) obesity ($p=.059$), diabetes ($p=.635$), and alcohol-substance abuse ($p=.387$).

There was no association between depression and length of hospitalization (depression=4.7days vs. No depression=5.5 days, $p=.328$). Furthermore, there was no difference in wait time ($p=.879$), fever ($p=.265$), normal pulse ($p=.748$), normal respiratory rate ($p=.496$), high blood pressure($p=.933$), low blood pressure($p=.666$). Those admitted with depression had a higher rate of having a procedure performed (81.0% vs. 67.5%, $p=.037$), however, there were similar rates of laboratory tests ($p=.247$) and if medications were given ($p=.352$).

Conclusions: We found 8.7% of visits hospitalized with ischemic events had depression in U.S. EDs from 2014-21. Depression was not associated with length of stay among those hospitalized for ischemic events, which is contrary to previous studies. Future studies should examine depression and length of hospitalization for ischemic heart disease.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

168. Assessment of Food Security and Diet Quality in the United States, 2022

Brianna E. Lupo, James R. Beal, PhD, Abe E. Sahmoun, PhD

Medical Student

Purpose: Food insecurity affects 10.8% of American households, an estimated 33.8 million people, and is associated with chronic disease in adults including obesity, cardiovascular disease, and type 2 diabetes mellitus. The purpose of this study was to determine the association between food security and quality of dietary intake in adults in the United States.

Methods: We conducted a cross-sectional analysis of adults ages 20-65 years old using the 2022 National Health Interview Survey-Adult (NHIS) dataset. We compared reported food security to the quality of dietary intake. For this study, we used the NHIS-calculated food security variable to create two categories: food secure and food insecure. Food secure included the categories “high food security and marginal food security” and food insecure included the categories “low food security” and “very low food security. SAS 9.4 was utilized to analyze data using Chi-squared and two-sided t-tests with significance set at $p<.05$. Institutional Review Board approval was obtained from the University of North Dakota.

Results: Of the estimated 243 million adults aged 20-65 years in the United States, 7.9% had food insecurity. Adults with food insecurity were more likely to be 18-49 years old (61.7% vs. 52.3%, $p=.000$), female (61.7% vs. 52.3%, $p=.000$), participate in Supplemental Nutrition Assistance Program (39.8% vs. 10.9%, $p=.000$), and participate in Women, Infants & Children Program (13.6% vs. 5.8%, $p=.000$). They were less likely to be White (65.7% vs. 78.1%, $p=.000$), earn a bachelor’s degree (19.8% vs. 34.7%, $p=.000$), be married (31.4% vs. 53.4%, $p=.000$), and work 35+ hours a week (69.3% vs. 81.5%, $p=.000$).

Food insecure adults consumed a significantly lower amount of salad servings (2.8 vs. 3.4, $p=.000$) and a significantly higher amount of sugared soda servings (3.0 vs. 1.9, $p=.000$) and sugared fruit drink servings (1.3 vs. 0.7, $p=.000$) in the past month. There was no significant difference between food security and fruit consumption ($p=.701$), vegetable consumption ($p=.216$), or fried potato consumption ($p=.057$).

Conclusions: This study identified that US adults ages 20-65 years old with food insecurity have poorer quality of dietary intake with lower salad intake, higher sugared beverage intake, and higher juice intake than their food secure counterparts. These findings suggest further opportunity for dietary intervention with potential to improve health of American adults of lower means.

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169. Association between Race and Management of Mild Traumatic Brain Injury in United States Emergency Departments

Annika O. Price, B.S., Amanda P. Mathies, B.S., Austin J. Hill, B.S., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: Previous small studies point to racial disparities in the treatment of mild traumatic brain injury (mTBI) in emergency departments (ED). The purpose of this study was to determine the association between race and management of mTBI in adult ED visits in the United States. **Method:** We conducted a retrospective analysis of the management of adult (18 years and older) mTBI visits using the 2012-2021 National Hospital Ambulatory Medical Care Survey Emergency Department datasets. We compared the ED management of mTBI between races, including diagnostic imaging, laboratory studies, procedures, treatments, and dispositions. **Results:** This study included approximately 18 million estimated adult visits for mTBI. Of these visits, Whites account for 79.2, Blacks-17.1%, Other-3.7%. Black visits were younger (40.5 vs 52.5% and 47.0 years, $p=.001$) and more likely to not have any insurance (19.4 vs. 9.5% and 10.4%, $p.004$) compared to Whites and Others. There was no association between race and sex ($p=.166$). Black visits had higher rates of motor vehicle-related reasons for visit (58.4% vs 41.5% and 39.9%, $p=.001$) and lower rates of accident or falls (20.9% vs 36.3% and 34.3%, $p=.001$) compared to Whites and Others. Black and Others had higher alcohol (6.8% and 9.5% and 3.2%, $p=.025$) and violence-related (11.9% vs 12.7% and 5.7%, $p=.001$) reason for visits than Whites. Black visits reported higher rates of severe pain than Whites and Others (22.7% vs. 14.8% and 8.5%, $p=.025$). Black individuals were less likely to receive a CBC (22.0% vs. 31.8% and 31.1%, $p=.008$), an EKG (11.8% vs. 19.1% and 19.8%, $p=.014$), and to be admitted (4.4% vs. 8.0, % and 6.3%, $p=.039$) compared to Whites and Others. Black visits had a higher rate of receiving any analgesics than Whites and Others (65% vs 55.5% and 57.8%, $p=.039$). However, there was no association between race and receiving an opioid ($p=.328$) or NSAID/acetaminophen ($p=.199$). Black and White visits were more likely to receive a CT head scan than Others (69.5% and 74.4% vs. 60.0%, $p=.023$). **Conclusions:** We found racial disparities in the management of the estimated 18 million adult visits for mTBI to U.S. EDs between 2012-2021. This is congruent with previous studies. We found Black and White visits were more likely to receive a CT head scan than Others. Black patients were less likely to receive a CBC, EKG, and to be admitted than White and Other. Black patients were more likely to receive analgesics than White and Other patients.

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170. Factors Associated with Substance Use Disorder Screening among Primary Care Physicians in the United States, 2014-19

Emily Anderson, B.S., Jordan Oliphant, B.A., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: Substance use is an important cause of preventable death in the US. Substance use screening tools are quick, inexpensive, and could be instrumental in saving an individual's life. The purpose of this study was to determine factors associated with substance use disorder screening among primary care physicians.

Method: We conducted a retrospective analysis of adult primary care clinic visits utilizing the 2014-19-National Ambulatory Care Survey datasets. Inclusion criteria included adults 18 years or older seen by a primary care physician for a new or chronic problem or preventive care visit. We compared the rates of demographic and clinical factors among adults screened and not screened for substance abuse. Substance abuse screening included the presence of NIDA/NM, ASSIST, CAGE-AID, or DAST-10 within the medical record.

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Results: Of the estimated 1.7 billion primary care visits, 1.5% or 26 million were screened for substance abuse. Screened visits were more likely to be White (89.9% vs. 79.8%, $P=.008$) and a new patient (19.8% vs. 9.9%, $P=.015$). There was no association between screening and gender ($P=.121$), age ($P=.874$), private insurance ($P=.787$), regional ($P=.180$), and metropolitan area ($P=.220$), and being the patient's primary care physician ($P=.493$).

Clinically, screened visits had higher comorbidities rates for alcohol abuse (4.8% vs. 1.1%, $P=.048$) and substance abuse (15.9% vs. 3.6%, $P=.001$). There was no rate difference with screening and having depression ($P=.322$). Screened visits were more likely to be prescribed an opioid use disorder medication (4.8% vs. 09%, $P=.001$). There was no difference with screening and number of medications ($P=.381$).

Management factors showed screened visits were more likely to be to receive counseling for substance abuse (11.8% vs. 1.1%, $P=.001$) and alcohol

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171. Comparing Management of Psychiatric Disorders in Rural and Urban Clinics in the United States

Connor Sheridan BS, Sean Keup BS, Kyle Wegner BS, Abe E. Sahmoun, Ph.D., & James R. Beal, Ph.D.

Medical Student

Purpose: The primary objective of this research was to examine if the management of psychiatric disorders varies between rural and urban clinics in the United States.

Method: A retrospective review of adults with psychiatric disorders was conducted using the 2011-2019 National Ambulatory Medical Care Survey datasets. Demographic, clinical, and management factors of adult psychiatric disorder visits were compared between rural and urban clinics.

Results: Of the estimated 4.5 billion clinic visits in the US, 20.2% had a psychiatric disorder. There was an increasing trend in the rate of psychiatric disorder visits from 2011-2019 ($P=.001$). Rural clinics had a higher rate of psychiatric disorder visits compared to urban clinics (24.3% vs. 19.7%, $P=.010$). Overall, 11.5% of psychiatric disorder visits occurred in rural clinics.

Rural visits were more likely to be White (94.5% vs. 87.5%, $P=.001$), have government insurance (48.6% vs. 39.2%, $P=.001$), and occur in the Midwest (36.2% vs. 32.9%, $P=.010$). There was no association between rural-urban visit and age ($P=.134$), gender ($P=.096$), established patient ($P=.198$), and time spent ($P=.218$).

Clinically, rural visits were more likely to occur with a primary care physician (74.2% vs. 56.7%, $P=.020$), seen by patient's primary care physician (66.8% vs. 48.6%, $P=.008$), and for a new problem (26.1% vs. 21.2%, $P=.048$). Rural and urban visits had similar comorbidities rates of depression ($P=.955$), ADHD ($P=.190$), anxiety ($P=.865$), bipolar ($P=.831$), acute stress ($P=.387$), or alcohol-substance abuse ($P=.801$).

Rural visits were less likely to receive a neurologic exam than urban visits (8.4% vs. 13.6%, $P=.022$), while rates of alcohol abuse counseling ($P=.223$), mental health counseling ($P=.215$), psychotherapy ($P=.529$) were similar. Additionally, there was no difference in the rate of prescriptions for psychotropic medications including antidepressants, anxiolytics, sedatives, hypnotics, antipsychotics, anticonvulsants, and CNS stimulants (all $P>.05$).

Conclusion: We found psychiatric conditions made up an increasing proportion of clinic visits. Rural clinics had a higher rate of psychiatric disorders compared to urban clinics. Management of psychiatric disorders was comparable between rural and urban clinics with similar rates of counseling and medications, except for neurologic exams, despite rural clinics having a lower rate of specialized medical providers.

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172. UNNECESSARY ANTIBIOTICS USE FOR COMMON RESPIRATORY ILLNESS IN URGENT CARE SETTING

Jaelyn Baisch, Miriah Forness, Abilene Leitch, Maxx Enzmann, Paul Carson, Emily Perry, Dubert Guerrero

Medical Student

Purpose: Inappropriate use of antibiotics for viral upper respiratory infections (URI), pharyngitis or bronchitis directly contributes to antibiotic resistance. Assessment of unnecessary antibiotics prescribing practices can lead to educational interventions that can reduce inappropriate prescribing and, in effect, antibiotic resistance. We examined common reasons for inappropriate antibiotics prescription for nonspecific URI in a primary urgent care setting.

Methods: This was a single-center, point-prevalence study of Sanford Health urgent care clinics in Fargo, North Dakota. Antibiotic prescribing data were collected via an electronic algorithm, which included all urgent care encounters with ICD-10-CM codes for AURI, bronchitis, or pharyngitis without a positive Group A Streptococcus test. We excluded all subjects who may have required antibiotics for other reasons. Performance was reported as an appropriate care rate (ACR), or the percentage of encounters with "never" indications and no antibiotic prescribed, compared to total encounters with "never" indications. A subset of patient charts were reviewed for provider documentation of reasoning for inappropriately prescribing antibiotics.

Results: Of 13,336 respiratory encounters from January 1, 2022 to November 30, 2023, 10,318 encounters appropriately resulted in no antibiotics prescriptions reflecting an ACR of 77.4%. Manual review of 226 encounters for URI, showed 53 (23%) were inappropriately prescribed a macrolide. Reasonings documented by providers included the idea that macrolide is indicated for URI. Of 21 patients with rhinitis, 4(19%) was prescribed antibiotics due to description of purulent rhinitis. Other common reasons, antibiotics were prescribed for bronchitis (n=38), include colored sputum 4(11%), duration of >2 weeks 9(27%) and congestion 3 (8%). A total of 36 patients were prescribed antibiotics for pharyngitis without nucleic acid testing. Reasons for antibiotics prescription were tonsillar involvement 6(17%) and presence of exudates 4 (11%).

Conclusions: Almost 1/3 of patients in the urgent care setting are inappropriately prescribed antibiotics for pharyngitis, URIs and bronchitis. We examined common reasons documented by providers for inappropriate antibiotics prescription in this setting. With this data, we plan to implement further education intervention to improve antibiotics prescribing in the outpatient setting.

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173. Association Between Rural and Urban Residence with Prevalence of Cancer in Adults within the United States

Rebecca C Rist, A.B., April D Hagemester, B.S., James R Beal, Ph.D., Abe E Sahmoun, Ph.D.

Medical Student

Purpose: Living in a rural setting poses unique risks, including decreased access to healthcare, increased exposure to pesticides, unclean drinking water, and other related agricultural chemicals and environmental toxins, some of which increase the risk of cancer. The purpose of this study was to determine the association between rural and urban residence and prevalence of cancer in adults in the United States.

Method: We conducted a retrospective analysis of the prevalence of cancer in rural and non-rural settings in United States adults utilizing the 2022 Behavior Risk Factor Surveillance System dataset. We compared the prevalence of adult cancer in rural and urban areas in United States. Rural populations will be defined as nonmetropolitan counties (Micropolitan/Noncore) and Urban populations will be defined as metropolitan counties (Large central metro, Large fringe metro, Medium metro, and Small metro). Chi-square tests were

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performed, all significance tests were two-sided, and $P < .05$ were considered significant. This study was approved by the Institutional Review Board of the University of North Dakota.

Results: Of the estimated 260 million adults in this study, 6.2% reported living in rural areas and 93.8% in urban areas. Rural adults were more likely to be 65+ years (28.2% vs. 22.7%, $p = .000$), White (77.5% vs. 57.7%, $p = .000$), only graduate high school (36.0% vs. 27.0%, $p = .000$), and no health insurance (9.7% vs. 8.5%, $p = .002$). There was no association between rural-urban status and gender ($p = .238$). Overall, 8.2% of adults reported having cancer. Rural adults had a higher prevalence of cancer to their urban counterparts (9.5% vs. 8.1%, $p = .000$). Also, rural adults were more likely to report a fair or poor health status (22.3% vs. 17.5%, $p = .000$). There was no association between rural-urban status and having a personal doctor ($p = .056$).

Conclusions: We found 8.2% of adults have cancer in the U.S., with those in rural areas having a higher prevalence than those in urban areas. Rural adults had risk factors associated with cancer, including increased age, lower level of education status, fair or poor health status, and lack of health insurance. There is a need for increased public health campaigns and policies aimed at increasing resources and access to healthcare, especially in rural communities, as cancer treatment is one of the most expensive medical treatments.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

174. Association Between Ambulance Arrival and Hospitalization among Adults with Shortness of Breath in United States Emergency Departments

Regan Washist, B.A., B.S., Marie Tate, B.A., B.S., Bo Lauckner, B.S., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: Patients with shortness of breath have a high utilization of ambulance, with arrival by ambulance leading to increased diagnostic tests. The purpose of the study was to determine the association between ambulance arrival and hospitalization of adult visits with shortness of breath in United States emergency departments.

Method: We conducted a retrospective analysis of adult (18+ years) ED visits for shortness of breath utilizing the 2012-21 National Hospital Ambulatory Medical Care Survey Emergency Department datasets. We compared ambulance to other modes of arrival to the emergency department and hospitalization.

Results: Of the estimated 978 million adult US ED visits between 2012 and 2021, 15.7% were for shortness of breath. Of the estimated 154 million ED visits for shortness of breath, 25.3% arrived via ambulance. Ambulance visits were more likely to be male (45.9% vs 43.6%, $p = .047$), older (61.1 vs. 50.1 years, $p = .001$), have government insurance (75.0% vs 56.2%, $p = .001$) and visited the ED within 72 hours (4.4% vs 3.3%, $p = .035$). Ambulance visits were less likely to have a private residence (85.9% vs 98.4%, $p = .001$). Clinically, ambulance visits had higher rates of immediate triage (44.8% vs 29.9%, $p = .001$), low blood pressure (12.0% vs 5.7%, $p = .001$), low oximetry (6.8% vs 3.8%, $p = .001$), and fever (3.8% vs 2.0%, $p = .001$). Ambulance visits had lower rates of wait time (28.0 vs. 38.1 mins, $p = .001$), normal pulse (69.8% vs 74.4%, $p = .001$), normal respiratory rate (47.3% vs 57.2%, $p = .001$), and severe pain (33.3% vs 39.8%, $p = .001$). Management factors showed ambulance visits had higher rates of receiving any imaging (83.7% vs 80.1%, $p = .001$), xray (77.6% vs 73.4%, $p = .001$), CT scan (23.4% vs 18.6%, $p = .001$), BiPAP/CPAP (4.7% vs 1.2%, $p = .001$), nebulizer therapy (15.1% vs 12.3%, $p = .001$), IV fluids (56.4% vs 42.9%, $p = .001$), cardiac monitor (34.0% vs 25.8%, $p = .001$), and medications (4.1 vs. 3.3, $p = .001$). Ambulance visits were more likely to be hospitalized (43.4% vs 19.2%, $p = .001$) and length of stay (6.2 vs. 4.6 days, $p = .001$). They also had longer length of visits (355.0 vs. 289.3 mins, $p = .001$).

Conclusions: ED visits for shortness of breath arriving via ambulance had higher triage levels, received more diagnostic tests and procedures, and were hospitalized more often those arriving by other modes.

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These findings confirm previous studies that arrival by ambulance leads to increased diagnostic tests but adds the new findings of increased hospital resources.

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175. Association of Race and Management of Adult Nonurgent Visits for Pain in United States Emergency Department, 2012-21

Hollie Bearce M.S., Kendra Roland, M.PH., Abe E Sahmoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: The purpose of this study was to determine the association between race and management in adult nonurgent visits for pain in the United States Emergency Departments (ED).

Methodology: A retrospective analysis was conducted of adult non-urgent visits for pain to the ED comparing management of pain by race using the 2012-2021 National Hospital Ambulatory Care Survey Emergency Department datasets. Non-urgent was defined as triage level of non-urgent or semi-urgent. We compared the management (laboratory tests, imaging, and medications) of pain by race.

Results: Of the estimated 338 million visits for pain to the ED, 30.9% or 104 million were for non-urgent pain. Of non-urgent pain visits, 71% were White, 25.4%-Black, and 2.9%-Other races. Black and Other visits were younger (40.8 and 41.7 vs. 43.7years; $P=.001$) and more likely to live in urban rural areas (91.7% vs. 92.8% and 78.7%; $P=.003$). Black visits were more likely to have government insurance White and Other visits (56.8% vs. 51.7% and 48.1%; $P=.001$). There was no association between race and gender ($p=.194$) or private residence ($p=.363$).

Clinically, Black visits reported a higher rate of severe pain (70.2% vs. 64.3% and 62.6%; $P=.001$) and Black and White visits had more comorbidities (0.8 and 0.9 vs. 0.6; $P=.001$). Black visits were less likely to receive diagnostics (64.3% vs. 67.8% and 67.8%; $P=.028$) and Black and Other visits received lower rates of imaging (53.5% and 49.6% and 59.1%; $P=.001$). Black and Other visits were less likely to receive opioid analgesics (32.2% and 35.2% vs. 40.2%; $P=.001$), while Black and Other visits were more likely to be prescribed a non-opioid analgesic (53.5% and 50.9% vs. 46.4%; $P=.002$). There was no association between race and wait time ($p=.187$), length of visit ($p=.142$), seen in 72 hours ($p=.609$), alcohol abuse ($p=.141$), substance abuse ($p=.415$), basic metabolic panel ($p=.517$), comprehensive metabolic panel ($p=.114$), urinalysis ($p=.674$), xray ($p=.195$), MRI ($p=.831$), US ($p=.665$), any analgesic ($p=.775$), medications ($p=.182$), admitted ($p=.069$), or length of stay ($p=.431$),

Conclusion: Racial disparities exist in the management of adult nonurgent visits for pain in US EDs. Minority visits reported higher rates of severe pain, but had lower rates of diagnostics, imaging, and opioid analgesics than White visits.

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176. Association Between Rural/Urban Residence and Having a Personal Doctor Among Melanoma Patients

Cole Rokke, Thomas Baker, James R. Beal, and Abe E. Sahmoun

Medical Student

Background: Melanoma is a potentially lethal skin cancer arising from malignant changes of melanocytes. Early screening and detection are key to patient outcomes, yet these may differ in urban versus rurally due to differences in healthcare access, education, and lifestyle. This study's aim was to assess the association between type of residence and having a personal doctor among adults diagnosed with melanoma.

Methods: This retrospective review used data from the CDC's 2018-2022 Behavioral Risk Factor Surveillance System telephone interview survey. We compared having a personal doctor between rural and

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urban adults with melanoma. Inclusion criteria was adults with melanoma. Exclusion criteria was adults without melanoma. We used the NCHS Urban-Rural Classification Scheme to stratify urban versus rural. Data analysis used summary statistics and bivariate comparisons. All significance tests were two-sided, with $p < 0.05$ considered significant. SAS 9.4 was used to analyze the data while accounting for the BRFSS complex sample survey design. Data was analyzed using the sampled visit weight that was the product of the corresponding sampling fractions at each stage in the sample design.

Results: Approximately 1.8 million melanoma patients were surveyed, 91.3% from urban settings and 8.7% from rural. Rural regions demonstrated a higher percentage of adults 65 and older (64.3%) compared to urban (56.5%) ($p=0.023$). Education level showed significant disparities between the urban and rural setting ($p=0.000$). A higher percentage of rural residents did not graduate high school (11.0%) compared to urban (7.0%). More urban (35.8%) than rural (17.2%) residents completed post-secondary education.

Most reported having a personal doctor (urban: 93.8%, rural: 92.5%). The percentage of rural participants who answered "none" to having a personal doctor (7.5%) was not significant compared to urban participants (6.2%) ($p=0.368$). Family medicine and internists were often the primary doctors (urban family medicine: 46%, internists: 28.2%; rural family medicine: 53.5%, internists: 25.5%). Though there was no significant difference in the type of doctor providing the most care ($p=0.202$). Insurance coverage (urban: 96.4%, rural: 97.2%) had no significant difference between groups ($p=0.559$).

Conclusion: While there were some differences in demographics and healthcare characteristics between urban and rural cancer patients, many parts of cancer care appeared to be comparable.

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177. Association between Rural-Urban Residence and Depression and Anxiety Symptoms among Children in the United States

Lauren R. Hollingsworth, B.S., James R. Beal, Ph.D., and Abe E. Sahnoun, Ph.D.

Medical Student

Purpose: Previous research has established that demographic factors play a role in mental health outcomes. However, the relationship between rural or urban residence and psychiatric disorders has not yet been elucidated. The purpose of this study was to determine the association between rural-urban residence and depression and anxiety symptoms in children in the United States.

Method: A retrospective analysis of children aged 5-17 years was conducted utilizing the 2022 National Health Interview Survey-Child dataset. We compared the rates of depression and anxiety symptoms among children who live in rural and urban areas. Depression was defined by the frequency of "how often the child seems very sad or depressed," while anxiety by the frequency of "how often the child seems very anxious, nervous, or worried." "Rural" was defined as nonmetropolitan counties (Micropolitan/Noncore), and "urban" as metropolitan counties (large central metro, large fringe metro, medium metro, and small metro).

Results: Of the estimated 5.4 million children in the U.S. in 2022, 33.5% had depression and 54.1% anxiety symptoms. Overall, 13.1% of children lived in rural areas. Rural children were more likely to be white (83.0% vs. 70.3%, $p=.001$), not have health insurance (6.2% vs. 4.2%, $p=.049$), be a U.S. citizen (99.0% vs. 96.3%, $p=.004$), be on food stamps (26.9% vs. 21.8%, $p=.048$), and have some difficulty learning (11.4% vs. 7.7%, $p=.048$). There was no association between rural-urban residence and age ($p=.617$), gender ($p=.773$), food insecurity ($p=.118$), WIC benefits ($p=.326$), 2+ hours screen time ($p=.077$), sport participation ($p=.775$), bullying ($p=.055$), or being a victim of violence ($p=.070$).

Rural children had a higher rate of daily depression symptoms compared to urban children (9.4% vs. 6.7%, $p=.016$), while there was no difference in rate of daily anxiety (19.5% vs. 19.0%, $p=.819$). Rates for other health were similar between rural and urban children including BMI (.103), general health ($p=.873$), use of mobility equipment ($p=.226$), and ADHD ($p=.321$).

Conclusion: We found that 33.5% of children experience depression symptoms and 54.1% experience anxiety symptoms. Children who live in rural areas reported experiencing daily depressive symptoms at a

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higher rate than their urban counterparts. However, rates of daily anxiety symptoms were similar. These findings reinforce the importance of increased mental healthcare access, especially in rural areas.

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178. Association Between Food Insecurity and Obesity among Children in the United States

Grace Lavandowska B.S., B.A., Tatiana Roberts B.S., James R Beal, Ph.D., Abe E Sahnoun, Ph.D.

Medical Student

Purpose: Food insecurity is a topic of interest due to the presumed effect on the health of the general population. Food insecurity in the pediatric population is of significant interest as dietary habits are established in childhood and food insecurity is believed to increase the risk of obesity. The purpose of this study was to analyze the relationship between food security and childhood obesity.

Methods: A retrospective analysis was conducted of children, aged 5-17 years, using nationally representative data from the 2016-22 National Health Interview Survey-Child datasets. Food security levels were categorized as food security (high and marginal food security) and food insecurity (low and very low food security). SAS 9.4 for Windows will be used to analyze the data in a manner that accounts for the NHIS complex sample survey design. Analysis was performed using Chi-square tests with two-sided P-values and P<.05 was significant. This study was approved by the IRB of the University of North Dakota.

Results: Of the estimated 53 million children, 10.5% or 5.5 million had food insecurity. Food insecurity was associated with Black race (31.3% vs 12.7%, P=.000), no health insurance (7.7 vs. 4.0, P=.001), 3+ children≥ 18 (50.0 vs. 39.5%, P=.000), and being a non-citizen (6.0% vs. 3.0%, P=.003). Food security was not associated with age (P=.333) or gender (P=.591).

Food insecurity children were more likely to be receiving WIC benefits (16.5% vs 7.1%, P=.000), food stamps (51.6% vs 19.1%, P=.000), and free/reduced school lunches (84.7% vs 56.8%, P=.000). Food insecurity was associated with being obese (8.1% vs 4.6%, P=.043).

Conclusion: We found children with food insecurity had a higher rate of obesity, which is similar to previous studies. Furthermore, food insecurity was associated with race, poverty ratio, health insurance status, citizenship, or federal nutrition assistance programs. These findings show there are avenues of change that could be pursued to mitigate these known risk factors earlier in childhood.

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179. Association Between Rural Residence and Pregnancy Outcomes among North Dakota Women with Pre-eclampsia

Mikayla Sabella, B.A., Alexa Weninger, B.S., Abe E Sahnoun, Ph.D., & James R Beal, Ph.D.

Medical Student

Purpose: Hypertensive disorders of pregnancies are on the rise in women living in rural and urban areas in the US. The purpose of this study was to determine the association between rural versus urban residence and pregnancy outcomes among women with pre-eclampsia in ND.

Methods: We performed a retrospective analysis of singleton, resident, in-state births utilizing 2007-2020 North Dakota Birth Records. We compared maternal and infant outcomes between urban and rural mother's residence. Maternal outcomes included postpartum transfusion, admission to ICU, unplanned hysterectomy, eclampsia and unplanned operation after delivery. Infant outcomes were preterm, low birthweight, NICU admission and infant mortality.

Results: Of the 133,355 women included in this study, 5.3% had pregnancy-induced hypertension or pre-eclampsia. Women in rural areas were younger (27.6 vs 28.4 years, P=.001), with higher rates of teen

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pregnancy (8.1% vs 3.7%, $P=.001$), and being unmarried (38.2% vs 32.0%, $P=.001$). Rural women were more likely to be American Indian (AI) (19.4% vs 4.7%, $P=.001$), not attend high school (9.7% vs 5.5%, $P=.001$), and have government insurance (40.1% vs 26.4%, $P=.001$). Women in rural areas had higher rates of alcohol/drug use (38.2% vs 32.0%, $P=.001$), and smoking during pregnancy (15.5% vs 10.7%, $P=.001$). There was no association between residence and gestational diabetes ($p=.555$), maternal infections ($p=.084$), and adequate prenatal care ($p=.070$).

Maternal outcomes showed rural women were more likely to be admitted to the ICU after delivery (0.7% vs 0.4%, $P=.011$). There was no association between residence and maternal transfusion ($p=.451$), unplanned hysterectomy ($p=.417$), eclampsia ($p=.908$), and unplanned operation after delivery ($p=.122$). Rural women newborns had lower rates of low birthweight (12.7% vs 15.3%, $P=.002$) and NICU admission (16.6% vs 18.8%, $P=.016$). There was no association between residence and premature rupture ($p=.834$), precipitous labor ($p=.675$), c-section delivery ($p=.261$), preterm birth ($p=.684$), or infant mortality ($p=.525$).

Conclusions: Among women with pre-eclampsia, rural women had higher rates of maternal risk factors. This did not result in increased morbidity, except for ICU admissions. In fact, we found rural women were less likely to have low birthweight and NICU admission. Women with pre-eclampsia in rural areas were likely to be AI, unmarried, have no high school education or have government insurance.

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180. Cervical Cancer Screening Among US-born and Foreign-born Women in the United States

Abigail Pleiss, B.S., Regina Schlichting, B.S., James Beal, Ph.D., Abe Sahmoun, Ph.D.

Medical Student

Purpose: Routine cervical cancer screening has decreased cervical cancer incidence and mortality yet significant disparities in cancer incidence by race and ethnicity persist in the United States. Research on uptake of the various cervical screening methods among US immigrants is limited. The purpose of this study is to determine the association between immigrant status (foreign-born and US-born women) and cervical cancer screening in the US.

Method: We conducted a retrospective analysis of women who were eligible for cervical cancer screening using the 2021 National Health Interview Survey (NHIS) dataset. We specifically examined variables assessing cervical cancer screening utilization and compared US-born and foreign-born women. Analysis was performed using summary statistics and bivariate comparisons (Chi-square tests and GLM Means). Significance tests were two-sided, p -value < 0.05 for significance.

Results: The sample consisted of 9,131 female survey respondents, of which 78.5% were born in the US or US territory and 21.5% were foreign-born. US-born women were more likely to have ever had cervical cancer screening (87.3% vs 74.4%, $p=0.000$) but less likely to have been screened within the past year (47.0% vs 50.2%, $p=0.014$). US-born women were more likely to have had an abnormal Pap smear within the past 5 years (10.7% vs 8.5%, $p=0.046$). Rates of HPV testing at most recent screening did not differ among groups, but Pap testing at the most recent screening occurred more often in US-born women (96.3% vs 93.9%, $p=0.000$). The reason for the most recent screening did not differ between groups. The reason a patient did not have screening in the past 5 years did differ; respondents either did not know why screening was not performed (36.8% US-born vs 43.6% foreign-born, $p=0.000$), did not know they needed screening (12.1% vs 11.9% foreign-born, $p=0.000$), their physician did not order testing (14.1% US-born vs 16.9% foreign-born, $p=0.000$), the patient had not had problems (10.2% US-born vs 13.3% foreign-born, $p=0.000$), or other reason (26.8% US-born vs 14.3% foreign-born, $p=0.000$).

Conclusions: We found that overall rates of cervical cancer screening among US-born and immigrant women in this sample were comparable to those typically reported in the US, though immigrant women were less likely to have been adequately screened. These results suggest a need for more thorough secondary prevention of cervical cancer screening among the US immigrant population.

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181. Association between Rural-Urban Status and Management of Cholelithiasis and Cholecystitis in United States Emergency Departments

Allie D. Stover, Jack M. Dirnberger, Abe E. Sahmoun, PhD, James R. Beal, PhD
Medical Student

Introduction: Gallstone disease is common amongst adults in the United States and incidence is increasing. However, many who are affected do not experience any symptoms. Those that have symptomatic disease can be managed in various ways, though removal of the gallbladder is considered the standard of care. Less-invasive operative techniques are typically preferred, but they are not always available to rural patients.

Methodology: This is a retrospective review of emergency department (ED) visits for cholecystitis and cholelithiasis utilizing the 2013-2021 National Hospital Ambulatory Medical Care Survey-Emergency Department (NHAMCS-ED) datasets used to comparing rural versus urban patient demographics and management.

Results: We found no significant difference in rates of cholelithiasis or cholecystitis between rural and urban patient groups. Rural EDs tended to use abdominal CT scan (39.3%) as primary form of diagnostic imaging whereas urban EDs favored abdominal ultrasound (52.8%). Use of abdominal ultrasound was significantly higher in urban EDs [52.8% urban vs 38.3% rural, $p < 0.05$]. Additionally, transfers to the operating room were significantly higher in urban EDs [11.1% urban vs 1.2% rural, $p < 0.001$]. Rates of admission to the hospital and length of stay were not significantly different.

Conclusions and Significance: Our findings suggest that management of cholelithiasis and cholecystitis in rural emergency departments is less likely to involve ultrasound imaging and treatment with operative intervention. This may be due to lack of clinical knowledge, limited availability of ultrasound machines, and/or lack of training in ultrasound imaging. Furthermore, rural patients with gallstone disease are less likely to be operated on even though rates of cholelithiasis and cholecystitis were not found to be statistically different than urban patient groups. This may be due to lack of surgical staff and physicians, transfer to urban facilities, or patient preference for non-invasive care. Further research is indicated to explore reasons for these differences in care and how they might influence patient outcomes.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

182. Polypharmacy Management of Adults with Attention Deficit/Hyperactive Disorder in the United States, 2011-19

Caylor Adkins, Abe E. Sahmoun, and James R. Beal

Medical Student

Purpose: Though there are established guidelines for the treatment of ADHD in children and adolescents, the guidelines for treating adults are less well defined. The purpose of this study was to analyze factors and trends related to polypharmacy management of adults with ADHD in clinics in the U.S.

Methods: We conducted a retrospective analysis of adult ADHD visits utilizing the 2011-2019 National Hospital Ambulatory Care Survey datasets. We compared demographic and clinical characteristics among adults with ADHD by monotherapy and polypharmacy of ADHD medication. Monotherapy consists of ≤ 1 ADHD drug prescription and polypharmacy is having ≥ 2 ADHD drug prescriptions.

Results: Of the estimated 4.5 billion adult clinic visits from 2011-2019, 1.7% had ADHD, with 91.8% managed with monotherapy and 8.2%-polypharmacy. Polypharmacy patients were younger (33.4 vs 38.1, $p = .02$) and more likely to be male (60.6% vs 46.2%, $p = .015$). Polypharmacy visits were more often for a new problem (24.9% vs 11.2%, $p = .001$) and to a medical specialist (67.6% vs 54.4%, $p = .049$), but fewer visits were established patients (73.3% vs 92.5%, $p = .001$). There was no association between polypharmacy and race ($p = .602$), private insurance ($p = .112$), being patient's primary care provider ($p = .076$) and urban/rural living (.594).

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Clinical management demonstrated that nonstimulants were used by 2.6% of total visits with increased use from 2014-19 ($p=.001$). ADHD stimulant utilization rate was 78.2% and remained stable from 2014-19 ($p=.228$). Overall, 9.1% of adult ADHD visits were not on any ADHD or psychotropic medication. Polypharmacy visits were on more medications overall than monotherapy visits (4.9 vs. 3.0, $p=.001$). Polypharmacy visits had higher rates of CNS stimulants (100.0% vs 76.2%, $p=.001$). and nonstimulants (28.9% vs 0.2%, $p=.001$). Polypharmacy visits had a lower rate of depression (23.7% vs 38.8%, $p=.001$). There was no association between polypharmacy and alcohol-substance abuse ($p=.704$), psychotherapy (.616), psychotropic polypharmacy ($p=.440$), psychotropics ($p=.397$), antidepressants (.124), antipsychotics (.959), and anxiolytics, sedatives, hypnotics (.224).

Conclusion: ADHD accounts for 1.7% of adult clinic visits. ADHD adults managed with polypharmacy tend to be younger, male and to be treated by a medical specialist.

Future studies should focus on the 9% of adults ADHD visits who are not treated with ADHD medications or psychotropics.

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183. Association between Rural-Urban Location and Alcohol-related Emergency Department Visits in the United States

Trenton T. Bohan, B.S., Abe E. Sahmoun, Ph.D., and James R. Beal, Ph.D.

Medical Student

Purpose: The Emergency Department (ED) is a common entry point into the healthcare system for many alcohol-related concerns. Previous studies demonstrated a 47% increase in alcohol-related ED visits in the US between 2006 and 2014. The aim of this study was to determine the association between rural-urban location and alcohol-related ED visits in the US.

Methods: We conducted a retrospective study of adult, aged 18+, alcohol-related emergency department visits utilizing the 2013-21 National Hospital Ambulatory Care Survey Emergency Department datasets. We compared the demographic and clinical factors of alcohol-related visits between rural-urban EDs, defined by Metropolitan Statistical Area. SPSS Complex Samples 29.0 was used to account for the complex sample design. Analysis was performed using Chi-square tests and GLM Means with $P<.05$ significant. Institutional Review Board approval was obtained from the University of North Dakota.

Results: Alcohol-related visits accounted for 2.4% of the estimated 940 million adult ED visits from 2013-21. Rural EDs had a lower rate of alcohol-related visits than urban EDs (1.6% vs 2.5%, $P=.003$). The annual rate of alcohol-related visits remained stable in rural ($P=.264$) and urban ($P=.185$) EDs between 2013-21.

Rural EDs accounted of 10.3% of alcohol-related visits to U.S. EDs. Rural ED alcohol-related visits were more likely to be White than urban EDs (88.5% vs 75.5%, $P=.023$). There was no association between ED location and gender ($P=.881$), average age ($P=.598$), insurance status ($P=.075$) or Region ($P=.234$).

Rural EDs had a shorter wait time (20.1 vs 33.9 minutes, $P=.001$) and length of visit (266.7 vs 420.2 minutes, $P=.001$) compared to urban EDs. There was no difference in rate of comorbidities of depression ($P=.579$), alcohol-substance abuse ($P=.810$), being seen in the last 72hrs ($P=.332$), injury-poison-related visits ($P=.145$), hospital admission rates ($P=.482$) or average length of stay ($P=.936$).

Conclusion: Alcohol-related visits accounted for 2.4% adult ED visits from 2013-21. Rural EDs had a lower rate of alcohol-related visits than urban EDs, with the annual rates of alcohol-related visits remaining stable at both locations from 2013-21. These results indicate that alcohol-related visits are still a significant health concern and urban EDs carry a slightly higher burden compared to rural EDs. These findings suggest there is an opportunity for both urban and rural communities to address alcohol use.

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184. Mental Health Illness Prevalence in Post-Stroke Patients

Carriveau W, Kelly M, Sahmoun AE, PhD, Beal JR, PhD

Medical Student

Background: Each year in the United States, strokes affect over 795,000 individuals with an economic burden estimated at nearly \$33 billion. Mental health disorders are a comorbidity in stroke survivors known to reduce the quality of life and effectiveness of rehabilitation. In recognizing these patient and economic burdens, we aim to understand current trends in post-stroke mental health illness. Therefore, the purpose of this study was to determine the associations between mental health illness and post-stroke survivors between 2011-2019.

Methods: We conducted a retrospective analysis using the database between 2011-2019. Data analyzed included patients ages 50 and older with a diagnosis of cerebrovascular disease/stroke or transient ischemic attack; patients without served as the non-stroke control. Mental health illness was defined as depression, bipolar, anxiety, acute stress, other mood disorder, unspecified/acute/chronic post-traumatic stress disorder, and/or history of depression. Demographic and clinical data was analyzed using summary statistics and bivariate comparisons (Chi-square, GLM Means). All significance tests were two-sided, P-value < .05 for significance.

Results: Of the 1.56 billion documented visits in the ambulatory setting from 2011-2019, 3.3% documented a history of stroke, while 17.1% documented a mental health disorder. There was an increased rate of mental health disorder diagnosis among post-stroke survivors compared to non-stroke controls between 2011-2019 (22.4% vs 16.9%, P=0.013). Most post-stroke patients utilized government insurance (79.0%, P=0.001), and had increased comorbid conditions, yearly visits, and prescribed medications as compared to non-stroke controls (4.4 ± 0.1 vs 2.3 ± 0.0 , 5.5 ± 0.3 vs 4.6 ± 0.1 , 7.1 ± 0.3 vs 4.9 ± 0.1 , P=0.001, respectively).

Conclusions: From 2011-2019, there were increased rates of mental health illness among post-stroke patients. In addition, they more frequently utilized government insurance, and had increased yearly healthcare visits, comorbid conditions, and prescription medications. Further efforts should be made to identify and treat mental health illness in post-stroke patients.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

185. Association of Screen Time and Utilization of Mental Health Services in School-aged Children in the United States

Lauren A. Blum, B.S., Sarah D. Streed, B.A., James R. Beal, Ph.D., Abe E. Sahmoun, Ph.D.

Medical Student

Purpose: Mental health disorder rates among youth are increasing within the same period that reliance on and use of technology is also increasing. The relationship between the two has been highly debated, with pros and cons to each argument. The purpose of this study was to determine the association between screen time and utilization of mental health services in school-aged children in the United States.

Methods: We performed a retrospective analysis of children (aged 5-17) using the 2019-2022 National Health Interview Survey-Child. We compared screen time usage (<2 vs. 2+ hours/day) by children and receiving counseling or medication from a mental health professional. SAS 9.4 for Windows was used to analyze the data using Chi-square tests and t-tests, with all significance tests will be two-sided and P<.05 being significant. Institutional Review Board approval was obtained from the University of North Dakota.

Result: Of the estimated 53 million U.S. children, 67.8% had 2+ hours/day of screen time and 32.2% <2 hours/day. Children with 2+ hours of screen time was associated with being older (12-17 years vs 5-11 years: 56.6% vs 28.0%, p=.000), male (52.3% vs 48.8%, p=.037), black (16.5% vs 10.5%, p=.000), and

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food insecure (11.4% vs 8.5%, $p=.013$). There was no association between screen time and health insurance ($p=.466$) or living in urban/rural areas ($p=.077$).

Clinically, 2+ hours of screen time daily was associated with receiving counseling from a mental health professional in the last 12 months (15.9% vs 9.5%, $p=.000$) and currently taking medication for a mental health disorder (10.7% vs 6.4%, $p=.000$). There was no association between screen time and having a personal doctor ($p=.676$), needing counseling in last 12 months but did not receive due to cost ($p=.201$), delayed counseling due to cost, in last 12 months ($p=.248$), and currently receiving services for mental health ($p=.077$).

Conclusion: We found a positive association between increased daily screen time by children and receiving counseling from a mental health professional and medication for a mental health disorder. Furthermore, it was found that children who are older, male, black, or food insecure have higher daily screen time exposure. Given the increasing reliance of the education system on learning via tablets, laptops, and screens in general, this study highlights the importance of early recognition of signs of mental health disorders in younger populations.

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186. Anatomic predictors of peripheral vascular access complications during transcatheter aortic valve replacement

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Medical Student

To investigate vascular access site risk factors using pre-operative imaging analysis, aortoiliac disease burden (ADB) score, ilio-femoral tortuosity, common femoral artery anatomical characteristics and disease patterns as a method of predicting vascular access complications during transcatheter aortic valve replacement (TAVR).

Consecutive patients undergoing TAVR from 2012-2022 at a single North Dakota hospital were retrospectively reviewed. Sectra IDS7 software was used for vascular analysis of the infrarenal, iliac and femoral vascular beds. Wilcoxon signed-rank test was used for non-normally distributed or t-test for normally distributed continuous variables and Chi-square or Fisher's exact tests for categorical variables were utilized to examine the association of each variable with vascular complications.

1389 patients were evaluated with 80 (5.8%) patients identified with vascular access complications. There was no difference in the incidence of diabetes, hypertension, renal disease, or obesity between groups. Patients with higher preoperative STS risk scores were more likely to suffer a vascular access complication (4.1% v 3.3%; $p=.020$). Other significant preoperative clinical predictors of vascular access complications included the presence of chronic obstructive pulmonary disease, coronary artery disease (CAD), peripheral vascular disease and previous percutaneous femoral arterial access.

ADB of the common and external iliac arteries were predictive of vascular complications. Patients who had left-sided or other alternative vascular access also were more likely to have a vascular access complication than patients with right-sided access. Left sided CFA vs. Right sided CFA access was associated with VAC ($p<.001$). Multivariate analysis shows CAD, heart failure, and intra-procedure intervention have decreased odds of vascular complications, while peripheral vascular disease PVD has increased odds.

Vascular access complications contributed to increased morbidity and prolonged hospital stays. While we did not observe a significant difference in one-year survival, our study may lack the power to detect a distinction. Quantifying vascular disease using the TASC scoring system offers further precision in identifying patients at risk for complications during TAVR. Posterior calcification and left sided CFA access were associated with increased complications. A formalized approach to peripheral vascular analysis may enhance patients' outcomes in TAVR.

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187. Differences in Management and Outcomes of Type 1 Diabetes and Type 2 Diabetes among American Indian/Alaskan Native and White Populations

Parker Heger, John Beaudrie, Seth Buryska, James Beal and Abe Sahmoun

Medical Student

Purpose: To investigate differences the management of diabetes in American Indian and White adults in the United States

Method: Retrospective analysis of adults with diabetes was performed using the 2018-2022 Behavioral Risk Factor Surveillance System datasets. We compared the management of American Indian/Alaskan Native (AI/AN) and White adults with diabetes mellitus (type 1 or type 2). SAS 9.4 was used in analysis using Chi-square tests and t-tests, with all significance tests two-sided, and $P < 0.05$ significant. This study was approved by the IRB of the University of North Dakota.

Results: Of the estimated 9.6 million adults with diabetes, 97.5% were White and 2.5% AI/AN. AI/ANs were more likely to be under 65 years (71.6% vs. 49.4%, $p = .001$), not graduate high school (24.9% vs. 11.5%, $p = .000$), not have health insurance (5.5% vs. 3.0%, $p = .019$), and live in rural areas (19.4% vs. 13.2%, $p = .001$). There was no association between race and gender ($p = .260$).

Clinically, AI/ANs were less likely to have a personal doctor (94.3% vs. 97.3%, $p = .000$). and to rate their health as good or better (52.6% vs. 61.3%, $p = .007$). There was no association between race and exercised within 30 days ($p = .815$), current smoker ($p = .145$), hypertension ($p = .396$), history or stroke ($p = .103$), and history or MI/CHD ($p = .985$).

Management factors showed AI/ANs had a lower rate of daily number of glucose checks (2.2 vs. 5.1, $p = .000$) and a higher rate of retinopathy compared to Whites (26.6% vs. 16.7%, $p = .000$). There was no association between race and diabetes education ($p = .054$), insulin use ($p = .486$), number of feet checks by provider ($p = .554$), and time since last eye exam ($p = .200$).

Conclusions: We found AI/ANs adults with diabetes had worse access to health care with lower rates of health insurance and having a personal doctor. This may account for the health disparities of lower rates of good general health, daily glucose checks, and increased rates of retinopathy in AI/ANs compared to Whites. These findings may help policy makers and providers increase resources to reduce these disparities, particularly as AI/ANs have a higher disease burden. Continued research is needed to further understand health care disparities and outcomes in these groups to implement systemic changes in the equity and quality of diabetic care they receive.

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188. FETAL ALCOHOL SPECTRUM DISORDER AND PEDIATRIC NEUROLOGY: ARE WE MISSING THE CONNECTION?

Michael Burd, James Miles, Graysen Myers, Bailey Engesether, Erika Johnson, Larry Burd

Medical Student

Purpose: The estimated prevalence of Fetal Alcohol Spectrum Disorder is 1-5% for children in North America. Despite this prevalence, FASD is discussed only sparingly in pediatric neurological literature. This project had two objectives, firstly to determine the number of pediatric neurology articles reporting on FASD compared to the number of articles reporting on ADHD or ASD. The second objective was to examine a sample of pediatric neurology patients and determine the prevalence of ADHD, ASD and FASD within the sample. Our intention was to facilitate discussion regarding a potential incongruence between the prevalence of FASD in clinical pediatric neurology, and the level of attention FASD receives in medical literature.

Method: Scoping Review: A medical librarian first searched the National Library of Medicine catalog for journals focused on pediatric neurology. A Pub Med search using a combination of MeSH terms and title

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keyword terms were then used to identify pediatric neurology journals. This list was limited to include only journals currently indexed for MEDLINE, and journals that were previously indexed for MEDLINE. Journals not published in English were excluded. Next the included journals were searched using a combination of MeSH terms and keyword terms to locate all articles published on the three conditions of interest – FASD, ASD, and ADHD. Chart Review: We reviewed the charts of pediatric neurological patients who received referrals to a local behavioral health clinic between the years of 2020-2023. During the chart review, all FASD, ADHD, and ASD diagnoses were quantified.

Results: Our scoping review of pediatric neurology articles through the present date, found 1043 articles discussing ASD, 685 articles discussing ADHD, and only 58 articles discussing FASD. Our chart review of 40 patients from a pediatric neurology clinic found that 20% received a diagnosis of FASD alone, and also observed strong rates of comorbidity between the conditions of interest, with FASD presenting comorbidly in 21% of patients with ADHD, and 2.5% of patients with ASD.

Conclusions: The results of our study show minimal discourse regarding FASD in the current literature. This is problematic considering the high estimated prevalence of FASD, and the high rates of comorbidity our study identified between FASD and common conditions such as ADHD and ASD. By facilitating awareness, research, and recognition of FASD, clinical outcomes and quality of life can be improved.

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189. Association Between Rural/Urban Residence and Body Mass Index Amongst United States Youth

Lindsey M. Martens, Amanda J. Hansmann, James R. Beal, Abe E. Sahmoun

Medical Student

Obesity prevalence has been increasing among United States youth. Not only is childhood obesity associated with a stigma leading to psychiatric issues, but it can also lead to comorbid conditions later in life such as sleep apnea, cardiovascular disease, and diabetes. Barriers to healthy habits in rural communities include decreased availability of fresh foods, exercise facilities, and healthcare professionals. Urban communities have fewer outdoor spaces, increased exposure to fast food, and greater healthcare demands. The purpose of this study was to assess the association between rural/urban residence and obese/overweight youth. We hypothesized that rural youth would have higher rates of obesity than their urban counterparts.

A retrospective review of the BMI of children (ages 2-17) was conducted utilizing the 2022 National Health Interview Survey (NHIS) dataset. The NHIS is an annual cross-sectional survey intended to provide nationally representative estimates on a wide range of health statuses in the US. Related variables to overweight/obese BMI in youth in urban versus rural settings were analyzed including age, gender, race, health insurance, citizenship status, food stamps, screen time >2 hours daily, sports team participation, well-child visit status, and WIC benefits. The NCHS Urban-Rural Classification Scheme, a stratification system based on US county and county-equivalent for rural-urban status, was used to define rural populations as nonmetropolitan counties and urban populations as metropolitan counties.

Of the estimated 64,811,570 (unweighted n=6,575) respondents, 12.9% reported living in a rural residence. Compared to urban youth, rural youth were more likely to be: White (70.3% vs. 81.2%; p = 0.007), overweight/obese (14.4% vs. 18.8%; p = 0.04), receive food stamps (21.8% vs. 28.5%, p = 0.007), and a US citizen (96.6% vs 99.1%, p = 0.003). There were no other significant differences between the covariates and the residence status.

Youth in rural populations were more likely to be overweight/obese compared to urban youth, supporting our hypothesis. Going forward, obesity prevention efforts should be tailored to address residence-specific barriers to healthy habits. Youth BMIs could be compared amongst various urban communities to determine if certain locations have implemented successful measures that helped to reduce childhood obesity rates. This analysis could be mirrored in rural communities.

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190. Delayed Diagnosis of Congenital Imperforate Hymen resulting in Obstructing Hematometocolpos

Brenna Hanson, B.S. and Courtney Hanson, B.S.

Medical Student

Background: The incidence of imperforate hymen is approximately 0.05-0.1%, making it a rare congenital anomaly of the female genital tract. This condition arises when the hymen completely blocks the vaginal opening, causing a buildup of menstrual blood flow and vaginal secretions known as hematocolpos. Imperforate hymen is commonly diagnosed in newborns or in adolescence with the onset of menses. It typically presents as a vaginal bulge and is often associated with cyclic pelvic pain, abdominal mass, urinary retention, dysuria, constipation, and dyschezia. Early detection and treatment are crucial to limit complications and improve overall patient outcomes. In this case, we present an adolescent female with an imperforate hymen resulting in significant hematometocolpos, leading to a large abdominal mass and pyelonephritis.

Case Presentation: A 12-year-old female with a recent history of recurrent constipation presented with suprapubic cyclic abdominal pain. Additionally, she reported urinary hesitancy and incontinence. Thelarche and axillary hair growth occurred about two years before her presentation, but she denied any history of menarche. Over the past month, she noticed a bulge near her introitus and an enlarging abdominal mass. During the physical examination, the physician observed a definite lower abdominal mass, significant labial swelling, and a membranous tissue obstructing the vaginal opening. Initial imaging revealed marked fluid distention of the vaginal and uterine cavities, consistent with hydrometrocolpos. A diagnosis of an imperforate hymen was made. Urgent surgical intervention was necessary; thus, an incision of the hymen was made, and 1200ml of chocolate brown blood was drained from the vaginal canal. The hymenal tissue was reapproximated and the cervix was identified prior to the end of the procedure.

Discussion: This case highlights the importance of early gynecologic care and physical examination. Education on normal female anatomy and development is often considered a taboo topic. However, social factors may increase the need for standardized education in schools. A dual effort between improved female adolescent education and routine gynecologic care are essential for early detection and treatment of female reproductive tract anomalies.

[Video Presentation](#) | [Live Q&A \(Zoom\)](#)

191. "Low-fat" Spindle Cell Lipoma of the Eyelid

Trenton T. Bohan, BS and Sri Krishna Arudra, MD

Medical Student

Background: Spindle cell lipoma (SCL) was first described by Enzinger and Harvey in 1975 after identifying lipomas with unique microscopic characteristics that were easily misdiagnosed as liposarcoma. These lesions are composed of mature fat cells admixed among uniform bundles of spindle cells in a collagenous to myxoid stroma that stain strongly positive for CD34 and negative for S100. SCL is a benign lesion most commonly affecting males between the ages of 45-70 years old considered curable by local resection only. We present a peculiar case of a "low-fat" variant of SCL of the eyelid.

Case Presentation: A 91-year-old male presented to his ophthalmologist for evaluation of a left lower eyelid nodule that had been present for an unspecified duration. The lesion was removed by excisional biopsy. A soft, white mass measuring 1.9 x 0.6 x 0.6 cm was received by pathology. Light microscopy of the mass revealed skin with a nodular proliferation of spindled fibroblasts within the dermis, increased interstitial mucin, scattered mast cells, and rare mature adipocytes (<5% of the tumor) within a

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background of thickened bundles of collagen fibers. Cytologic atypia and mitotic figures were not observed. Immunohistochemistry staining of the tumor was densely positive for CD34 and negative for S100. These findings were consistent with the diagnosis of a “low-fat” variant of spindle cell lipoma.

Discussion: Spindle cell lipoma exists on a histological spectrum of variable degrees of mature adipose cells including “low-fat” and “fat-free” variants composed of less than 5% mature adipose cells. This case represents just the third reported SCL of the eyelid and the second “low-fat” variant of the eyelid in the literature. “Low-fat” or “fat-free” variants of SCL are particularly challenging to recognize as they are histologically similar to liposarcomas, myxoid solitary fibrous tumors, cutaneous myxomas, schwannomas, and perivascular epithelioid cell tumors (PEComas). Differentiating benign SCL from other masqueraders with higher malignant potential has clinical importance, thus SCL should be considered on the differential diagnosis when examining older males with neck, shoulder, or back lesions. This report presents the case of this patient, reviews the literature of “fat-poor” SCL, and discusses the differentiation of SCL from other histologically similar lesions.

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192. Preconception Clinic and the Prevention of Adverse Pregnancy Outcomes

Nicholas Mathias, Ryan Schulte, Jean Marie McGowan, Peter Van Eerden, Abe Sahmoun, and Jenea Sweeter

Medical Student

Nearly 20% of pregnancies in the United States are complicated by an adverse pregnancy outcome (APO). Chronic diseases impact 14 million American women of reproductive age (15-44 years) and increase the likelihood of APOs which affect the health of the mother or newborn during pregnancy, labor and delivery, and the postpartum period. Preconception counseling offers an approach to reduce APOs by reducing modifiable risk factors and managing chronic disease. This retrospective chart review aims to examine the rate of APOs, highlight key risk factors, and determine the efficacy of preconception counseling in reducing APOs within the Fargo, North Dakota area patient population. Retrospective chart review was performed for 380 patients who received preconception counseling from three providers through the Fargo, ND Sanford Maternal Fetal Medicine Clinic between January 1, 2018, and June 30, 2022. Patients were referred by their primary care providers, specialists or were self-referred. Physicians at the clinic reviewed risk factors for APOs and made recommendations on how to optimize health prior to becoming pregnant. Inclusion criteria for pregnancies included conception occurring more than 30 days after clinic visit to allow for implementation of counseling recommendations, and pregnancies before April 30, 2022 to allow for full pregnancy outcome data collection. Twin pregnancy outcomes were excluded. Analysis was performed on risk factors at time of preconception visit and pregnancy outcomes after the visit. From the 296 patients that met criteria, 100 patients conceived at least once, resulting in 88 complete pregnancies and 37 spontaneous abortions. Prevalence of risk factors for APOs included 63.9% of patients having a history of antepartum hospitalization, 14.5% having chronic hypertension, and 10% with a history of gestational diabetes mellitus. Preeclampsia was seen in 10.2% of pregnancies after intervention compared to the national average of 5-7%. 20% of patients had preterm birth while the national average of preterm births was 10.5%. Adverse pregnancy outcomes were higher than national averages which may be attributed to a higher prevalence of risk factors in patients receiving preconception care compared to the general population. Next steps involve comparing with North Dakota APOs after matching subjects by age and pre-existing risk factors.

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193. Impact of Primary Care Visits on Diabetic Retinopathy Screening

Emma Kangas, B.A., James R Beal, Ph.D. & Abe E Sahmoun, Ph.D.

Medical Student

BACKGROUND: Diabetic retinopathy is a vision-threatening condition that is closely tied to duration and severity of poor glycemic control in individuals with diabetes. An annual dilated diabetic eye exam is an important screening tool to identify diabetes-related eye concerns even before subjective vision changes are identified.

PURPOSE: To determine prevalence of diabetic retinopathy with frequency of visits with health care providers for diabetic care.

METHODS: We conducted a retrospective analysis of adults who participated in the 2021 US Behavioral Risk Factor Surveillance System survey. We compared prevalence of diabetic retinopathy, either 'yes' or 'no' to frequency of primary care visits. Analysis was performed using summary statistics and bivariate comparisons (Chi-square tests and GLM Means). All significance tests are two-sided, P-value <0.05 for significance.

Of the nearly 25,000 respondents in our study, 10.5% had not been to the doctor in the past 12 months, 55.5% had been 1-3 times, and the remaining 34% had been 4+ times. The frequency of having eyes affected by diabetes was significantly higher in people who had been seen by a provider 4+ times in the past 12 months than those who had no visits or 1-3 visits [24.2% vs 14% and 16.4%; P-value: 0.000]. Conversely people who had more primary care visits in the past 12 months had a higher proportion of having an eye exam within the past 12 months [no visits: 54.3%, 1-3: 68.0%, 4+: 72.3%; P-value: 0.000] and were more likely to have participated in diabetic education courses [no visits: 38.2, 1-3: 51.4%, 4+: 57.1%; P-value: 0.000].

CONCLUSIONS: We found that frequency of primary care visits is associated with increased prevalence of diabetes affecting the eye, while also having more eye doctor visits within recommended time intervals (1 every 12 months) and more participation in diabetic education. This study highlights how increased severity of primary disease causes increased disease burden and the importance of early detection and intervention.

KEYWORDS: Diabetic retinopathy, screening, primary care visits, annual dilated diabetic eye exam, epidemiology, BRFSS.

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194. "Who's gonna take care of my babies?" The Impact of Children Treatment Decisions for Women with Metastatic Breast Cancer: A qualitative analysis

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Background: Few studies have explicitly examined the impact that children—and grandchildren—have on treatment decisions in metastatic breast cancer (mBC). This qualitative study examined how being a parent or grandparent influences treatment decisions for women with metastatic breast cancer. **Methods:** A qualitative sub-analysis with a purposive diverse sample of thirteen women with mBC in the Southeastern United States. Semi-structured interviews were conducted to explore treatment decision making, clinician-patient communication, and patient values relevant to treatment decisions. Transcribed interviews were analyzed, and thematic analysis was used to identify recurrent themes by three independent coders. **Results:** Nearly 50% of participants were women of color, 12 had children. Important factors for treatment decision-making involved 7 themes; 5 participants identified children and grandchildren as crucial to their cancer care decisions. Other common factors included side effects (54% of participants) and quality of life (46% of participants). Among participants who identified children as their priority expressed concern about "looking sick". Participants who identified grandchildren as their priority, being able to watch them grow up

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was important in decision making. For women who identified side effects and quality of life as important, children either provided supportive care or were too young to provide support. Conclusions: The presence of children and their relationship with participants was important in making treatment decisions for their cancer, rivaling other factors such as quality of life and side effects of treatment. Future tools should integrate questions about family and children, and how these considerations may impact treatment decisions.

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