12th Annual Research Symposium Abstract Book

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ROSEMAN UNIVERSITY
OF HEALTH SCIENCES

Basic Sciences

1. Nutritional Deficiencies and Associated Oral Health in Adolescents: A Comprehensive Scoping Review

Presenting Author: Amy Blazejewski (Roseman University)

Additional Author:

- Man Hung (Roseman University)
- Samantha Lee (Roseman University)
- Ryann Glenn (Roseman University)
- Johanna Lu (Roseman University)
- Andres Soto (Roseman University)

Purpose

Our research seeks to examine the common patterns seen in presentations of deficiencies and/or disorders in order to better serve our patients to get them the help they need

Methods

A literature search in PubMed, Dentistry & Oral Sciences, Source, Scopus, and Web of Science was conducted on September 13th, 2023. Peer-reviewed articles written in English and published from 2013 containing information on the negative impact of adolescent malnutrition on oral health were considered eligible for review. From the 594 studies obtained from the literature search, 88 studies were included.

Results

There is a high correlation between malnutrition, and oral health and development.
Children that are under or overweight, stunted, and or vitamin deficient are at high risk to experience oral health complications.
Childhood caries is a consequence seen in an overwhelming number of studies on childhood malnutrition, which further perpetuates undernutrition

Conclusions

This review is one of the first to explore the relationship between malnutrition, oral health, and development in adolescents. There is a strong correlation that suggests nutritional deficiencies are associated with sub-optimal oral health in adolescents. While there are many risk factors for nutritional deficiencies in adolescents, educating mothers and increasing access to more nutritious foods is paramount to combat malnutrition-related oral health issues.

2. Quantitative evaluation of mandibular asymmetry with the use of three-dimensional skeletal imaging techniques- A scoping review

- Presenting Author: Erinn Chang (Roseman University)

Additional Author:

- Jonathan Parrish (Roseman University)
- Konstantinia Almpani (Roseman University)

Purpose

Mandibular asymmetry can negatively affect an individual's oral function and facial esthetics. The correction of this deformity can be challenging for clinicians and surgical revision procedures are often required. Accurate quantitative diagnosis is important for optimal treatment results. The skeletal component of the mandibular asymmetry can be objectively assessed with the use of three-dimensional (3D) imaging in a quantitative way, but there are currently no formal guidelines. The aim of this study is to review the available information regarding the quantitative assessment of mandibular asymmetry with the use of 3D skeletal imaging modalities.

Methods

A thorough review of the literature was conducted according to the PRISMA-ScR guidelines. Five large online databases were searched for peer-reviewed human studies, including information about mandibular asymmetry assessment using 3D imaging. Article screening was performed independently by two reviewers using predefined eligibility criteria. Data extraction was also performed independently by two reviewers using a customized data extraction tool.

Results

: 30 studies met the eligibility criteria. Information about article type, study design, participants' characteristics, interventions, and outcomes were extracted and synthesized. For the assessment of mandibular asymmetry, in most studies, the first step was the establishment of a facial and/or mandibular symmetry plane and then the subsequent computation of the degree of asymmetry between the right and left sides of the face and/or mandible. Comparisons were based on landmark-based and volumetric approaches. Most studies reported results based on linear and/or angular measurements between bilateral landmarks. In other studies, a segmentation methodology and quantitative evaluation of the segmented 3D objects were implemented. Fully automated, 3D computer-executed pipelines have also been published but they are not currently commercially available.

Conclusions

Current technology allows for a precise quantitative assessment of mandibular asymmetry with the use of 3D imaging. The development of computer software for the automated assessment of the asymmetry in 3D is expected to significantly enhance clinical practice.

3. Title: Achondroplasia, Sleep Apnea, and Orthodontic Interventions: A Literature Review

- Presenting Author: Hayden McKay (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

Achondroplasia has a primary adverse health effect, mainly sleep apnea, as individuals with achondroplasia often exhibit structural abnormalities in their craniofacial and upper airway regions, predisposing them to this sleep-related breathing disorder. Orthodontic therapies can often help those with sleep apnea like the cases seen in patients with achondroplasia. Consequently, the review investigates the intricate relationship between achondroplasia and sleep apnea and the potential role of orthodontic interventions in mitigating these complications. This comprehensive analysis aims to shed light on the current state of knowledge, identify research gaps, and offer insights into potential therapeutic strategies to enhance the quality of life for individuals living with achondroplasia.

Methods

For this literature review, a systematic search was conducted across multiple electronic databases, including PubMed, MEDLINE, and Google Scholar. The search strategy involved a combination of keywords, such as "achondroplasia," "sleep apnea," "orthodontic interventions," and many other related synonyms. Inclusion criteria included peer-reviewed articles and research studies published up to the modern day written in English. The texts were examining the relationship between sleep disordered breathing in patients with achondroplasia and orthodontic treatments. A screening process was applied to select studies for inclusion, with a focus on relevance and quality. Titles and abstracts were initially screened for relevance, followed by a full-text assessment of those articles in question. Data extraction included study design, participant characteristics, key findings, and details of orthodontic interventions. The summary of findings highlights common themes, variations, and gaps in the existing literature. Thus providing a foundation for a comprehensive overview of the current state of knowledge around achondroblastic patients and their treatment of sleep apnea with orthodontic interventions.

Results

Orthodontics plays a central role in the assessment and management of obstructive sleep apnea (OSA) in individuals with achondroplasia (ACH), given the complex interplay of craniofacial anomalies, age-related airway changes, and surgical considerations. Studies highlight that midface retrusion, maxillo-mandibular anomalies, and skull base abnormalities are strongly associated with increased OSA severity, emphasizing the importance of early, age-appropriate orthodontic evaluation and intervention. While surgical correction is often necessary, persistent skeletal discrepancies frequently require complementary orthodontic management, underscoring the need for a coordinated,

multidisciplinary approach. Orthodontic treatments such as maxillary expansion, staged correction of anterior open bite, and support of midface advancement procedures have demonstrated potential to improve airway volume and reduce apnea indices, though challenges such as CPAP-related forces must be considered. Collectively, the literature supports a phased orthodontic strategy integrated with surgical and medical care to optimize airway function and long-term outcomes for ACH patients with OSA.

Conclusions

In summary, this review underscores the integral role of orthodontics in understanding, managing, and optimizing outcomes in individuals with achondroplasia experiencing obstructive sleep apnea. Orthodontic considerations permeate various aspects, from addressing anomalies and age-related factors to correlating with craniofacial skeletal shape modifications and guiding multidisciplinary follow-up and treatment approaches. The cited studies further validate and contribute to the orthodontic perspective in the comprehensive management of OSA in ACH individuals. There is still a large amount of research that needs to be done to further the treatment modalities for this specific group, and further studies should focus on improvements of sleep quality and facial esthetics.

4. Orthodontic Considerations for Children with Autism Spectrum Disorder: A Scoping Review

- Presenting Author: Kelly Leftwich (Roseman University)

Purpose

This scoping review synthesizes evidence from 14 scientific articles to provides a broad exploration of orthodontic approaches for children and adolescents with ASD, with an emphasis on malocclusion prevalence and complexity, associated behavioral and sensory considerations, and orthodontic interventions. Through the adoption of individualized interdisciplinary approaches, orthodontists can address the complex oral health needs of children with ASD with goals of improving their systemic health, social wellbeing, and quality of life.

Methods

A scoping review was performed. Research articles were deemed eligible for inclusion if they specifically addressed Autism Spectrum Disorder or an underlying component of Autism Spectrum Disorder that could be linked to orthodontic treatment:

Database Sources and Search Strategies
The initial search was conducted across multiple databases, namely PubMed, ScienceDirect, Dentistry & Oral Sciences Source, and Web of Science. These search engines were selected due to their extensive database of scholarly articles, clinical trials and research studies which span medical and dental fields. This intentional selection sought to broaden the scope of sources entered into the review, involving a vast array of scientific contributions. Specific keywords and search strategies were shaped into each database and implemented to ensure the retrieval of a wide range of relevant articles.

The following search terms were used: “Autism, ASD, Children, Pediatric, Epidemiology, Therapy, Malocclusion, Morphology, Functional Appliances, Orthodontics, Orthodontic Appliance, Obstructive Sleep Apnea, OSA, Physiopathology, Sleep Disorder.” The search across multiple databases yielded (14) articles which met the inclusion criteria, elimination of, exclusion criteria, and reviewer discretion for relevance after title and abstract review.

Results

Orthodontic health management of children with autism spectrum disorder presents unique challenges and considerations. Malocclusion presents with higher prevalence and increased complexity, (Alhammadi et al., 2018; da Motta et al., 2022; Farzanegan et al., 2024; Meuffels et al., 2022).

Common comorbid conditions, such as obesity, low muscle tone, motor impairments, and deleterious oral habits may thwart orthodontic care and compliance (Curtin et al., 2010;

Ming et al., 2007).

Children with ASD often experience heightened stress and anxiety during dental appointments, which necessitate more tailored management and desensitizing strategies. (Stein et al., 2014; Herrera-Moncada et al., 2019; Mehta & Uribe, 2022).

The inter-relationship between orthodontics, OSA and ASD highlights the importance of early identification and intervention through multidisciplinary collaboration (Bucci et al., 2023; Tomkies et al., 2019).

Recent advancements in orthodontic treatment modalities now allow for more tolerable alternatives to traditional fixed orthodontic therapy, such as clear aligners (Meuffels et al., 2024).

Conclusions

Future research is needed to explore how to optimize orthodontic practices by integrating expertise from behavior and sensory therapists to enhance the oral health and quality of life for individuals with ASD.

5. THE ROLE OF C1q IN THE DEVELOPING AUDITORY BRAINSTEM

- Presenting Author: Jason Khoury (Roseman University)

Additional Author:

- Karina Cramer (UC Irvine)
- Sima Chokr (UC Irvine)

Purpose

The primary objective of this study was to investigate the role of microglial C1q in the development and functional maturation of the auditory brainstem. Although C1q is established as a key initiator of synaptic pruning in the visual system, its contribution to the precise timing required for sound localization circuitry remains unknown. This research sought to bridge this gap by mapping the expression of C1q within the medial nucleus of the trapezoid body during critical developmental windows and by assessing the physiological consequences of its absence. Specifically, the study aimed to determine if C1q knockout mice exhibit deficits in signal propagation, thereby testing the hypothesis that the classical complement cascade is a necessary mechanism for synaptic refinement and the establishment of normal auditory function.

Methods

Wildtype and C1q knockout mice were transcardially perfused with paraformaldehyde at P8 and P14. Brains were immunohistochemically stained and imaged with a fluorescent microscope. C1q expression was measured by assessing immunopositivity within an outlined region of interest, the MNTB, using FIJI software. Auditory brainstem responses were measured using a TDT recording system and responses were analyzed on the TDT Biosig software. All statistical analyses were performed using GraphPad Prism software.

Results

'-C1q is robustly expressed in the medial nucleus of the trapezoid body (MNTB) both before (P8) and after (P14) the onset of hearing. Immunostaining revealed that C1q is not only present within microglial somas and processes but also specifically surrounds the principal cells of the MNTB, suggesting a targeted interaction.
-There is a distinct shift in C1q distribution relative to the tonotopic axis of the MNTB during development. Pre-hearing (P8): Expression is significantly higher in the medial regions, which correspond to high-frequency sound processing. Post-hearing (P14): The gradient inverts, with expression becoming significantly elevated in the lateral regions, which correspond to low-frequency sound processing.
-C1q knockout (KO) mice exhibit significantly decreased peak latencies compared to wild-type controls. This indicates a reduction in signal propagation time, particularly evident in the lower and middle frequency ranges.
-In addition to latency changes, the loss of C1q results in altered peak amplitudes at later

wave peaks across all tested frequencies, suggesting a disruption in the magnitude of neural synchrony or recruitment.

Conclusions

This study establishes that C1q is a critical component of the developing auditory brainstem, present specifically during the critical windows of synaptic pruning and circuit refinement. We identified a dynamic, tonotropic regulation of C1q, characterized by a medial (high frequency) to lateral (low frequency) shift in expression density that coincides with the onset of hearing. Furthermore, the congenital loss of C1q results in functional deficits, manifested as aberrant signal propagation speeds and altered response amplitudes. Collectively, these findings suggest that the classical complement pathway is essential for the precise maturation of sound localization circuitry.

6. The pro-inflammatory cytokine IL-26 localizes to the nucleus via a VOR complex-associated endocytic pathway

- Presenting Author: Sumaya Alaama (Touro University)

Additional Author:

- Nicole Kwong (Touro University)
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Purpose

Interleukin-26 (IL-26) is a pro-inflammatory cytokine that signals through a heterodimeric receptor complex. Upon binding, this complex induces signaling pathways involving proteins such as Janus kinase 1 (JAK1) and tyrosine kinase 2 (Tyk2), which then phosphorylate and activate signal transducer and activator of transcription (STAT) 1 and STAT3. Unlike most pro-inflammatory cytokines, which are typically anionic, IL-26 is cationic and has been shown to associate with extracellular DNA. This unique property raises the possibility that IL-26 may also engage intracellular compartments in ways not explained by canonical surface signaling alone.

Methods

Our lab has previously identified the VAP-A–ORP3–Rab7 (VOR) complex as a novel cellular pathway involved in regulated intracellular trafficking and nuclear access of protein-associated cargo. Based on this, we hypothesized that IL-26 may utilize a receptor-mediated endocytic mechanism involving the VOR complex to access perinuclear regions following cellular stimulation.

Results

Utilizing LoVo epithelial cells, which express the IL-26 receptor complex, we first confirmed by confocal microscopy that stimulation with IL-26 induced phosphorylation of STAT to pSTAT. We then observed that IL-26 localizes to nuclear envelope invaginations as well as in the nucleoplasm following stimulation. Notably, this localization was markedly reduced upon pharmacologic inhibition of the VOR complex using PRR851.

Conclusions

Together, these findings suggest a previously unrecognized intracellular trafficking route for IL-26 and implicate the VOR complex as a contributing pathway for IL-26 nuclear localization.

7. Evaluating the Effects of Ondansetron on Triple Negative Breast Cancer Cells MDA MB 231

- Presenting Author: Kim Bui (Roseman University)

Additional Author:

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- Rohitha Baskaran (Roseman University)
- Christopher So (Roseman University)

Purpose

Currently, it is unclear how the ondansetron could itself affect the cancer cells function in absence of any chemotherapy. Studying the effects of this drug, a very common drug prescribed to chemotherapy patients for nausea and vomiting, on cancer cells can possibly aid in the development of new therapeutic strategies against cancer. This study analyzes cancer cell growth, death and migration after treatment with high and low concentrations of ondansetron.

Methods

The triple negative breast cancer cell line MDA MB 231 was utilized and treated with ondansetron. Cell death, recovery, migration and colony formation was assessed when high and low concentrations of ondansetron were added. Colony formation was assessed 2 weeks after initial ondansetron treatment. Data was collected and analyzed by graphpad prism.

Results

The addition of ondansetron showed some effects on the triple negative breast cell line. While ondansetron alone did not significantly induce cell death except at very high concentrations, preliminary findings suggest that ondansetron pretreatment may increase cell migration towards a higher concentration of fetal bovine serum (from 10-20%). Further studies need to be performed to address how this is potentially occurring.

Conclusions

This study demonstrates that ondansetron can exert concentration-dependent effects on triple-negative breast cancer cells. The observed effects at high concentrations suggest that ondansetron, potentially through serotonin receptor inhibition or off-target mechanisms outside the serotonin receptor family, may influence cancer cell functions that could be relevant to chemotherapy resistance and outcomes.

8. Exploring the Post-Treatment Effects of Chemotherapeutics on Rat H9C2 Cardiomyocytes

- Presenting Author: Brandon Reed (Roseman University)

Additional Author:

- Girma Belachew (Roseman University)
- Nicolas Cook (Roseman University)
- Johnny Vang (Roseman University)
- Christopher So (Roseman University)

Purpose

Cardiotoxicity is a major adverse effect that limits the use of many chemotherapeutics. The occurrence of this is best associated with doxorubicin. Although cardiotoxicity from other chemotherapeutics occurs less frequently, these drugs may still exert other effects on cardiomyocyte survival and recovery. In this study, we query the effects of a range of chemotherapeutics on rat H9C2 cardiomyocytes. Our previous work showed that doxorubicin caused more cell death after 24 or 72 hours compared to other chemotherapeutics. However, the post-treatment recovery responses associated with each drug remains unclear.

Methods

In prior studies, cardiomyocyte cell number was assessed using the Cell Counting Kit-8 (CCK-8) following 24- or 72-hour drug exposure from high (-4) to low (-10. To evaluate post-treatment effects, cells will be treated with chemotherapeutics within the same concentration range for 24 hours, washed to remove specific drug, and then allowed to recover in drug-free growth media for an additional 24 or 72 hours. Cell number following the recovery period will be quantified again using the CCK-8 assay.

9. Exploring Agents that Modulate the TRPV1 (Transient Receptor Potential Vanilloid 1) Channel

- Presenting Author: Rory Shields (Roseman University)

Additional Author:

- Brandon Reed (Roseman University)
- Christopher So (Roseman University)

Purpose

Activation of the TRPV1 (Transient Receptor Potential Vanilloid 1) channel plays an important role in modulating pain perception. Current, ongoing research is seeking to determine whether pharmacologic agents can alter TRP1 channel activation to influence pain signaling pathways. Identifying compounds that modulate TRP1 activity may provide alternative pathways for pain management. In this study, TRP1 channel activation by capsaicin will be evaluated in human embryonic kidney cells, with additional medications co-administered to assess their effects on channel activation. Initial studies will focus on drugs targeting the purinergic receptor system, which is endogenously expressed in this cell line.

Methods

Human embryonic kidney (HEK) cells expressing T antigen will be stably transfected with TRP1 cDNA using an expression vector. Transfected cells will be treated with capsaicin alone or in combination with purinergic receptor–targeting agents. TRP1 activation will be assessed by measuring downstream ERK phosphorylation using an ELISA-based assay with anti-ERK antibodies. We will also be using the database STRING (string-db.org) to identify further pathways that could affect TRP1 activity.

Results

Work in Progress

Conclusions

Work in Progress

10. Comparison of Minimally Invasive Treatment Modalities for Post-Orthodontic White Spot Lesions

- Presenting Author: Jeremy Kasik (Roseman University)

Additional Author:

- Joe Cheever (Roseman University)

Purpose

The purpose of this study is to explore and compare the different minimally/non-invasive treatment options to treat white spot lesions including remineralizing agents, tooth bleaching (whitening), microabrasion, and resin infiltration to help clinicians make informed decisions.

Methods

A literature search was conducted to identify relevant studies on minimally invasive treatment options for WSL's. Databases including PubMed, Google Scholar, Scopus, and the Cochrane Library were utilized.

Results

Remineralizing agents such as fluoride varnish or CPP-ACP do show improvement in white spot lesions over time, but is dependent upon home care. Tooth bleaching does not resolve the lesions, but rather whitens the surrounding tooth structure to better mask the WSL. Microabrasion has shown improvement in appearance of WSL's due to reducing the amount of tooth structure involved, but isn't as effective in deeper lesions. Resin infiltration has shown the best results in esthetic recovery post-WSL.

Conclusions

Resin infiltration shows the most promising effects when used alone, but a combination of these treatments may be used to achieve an optimal esthetic outcome.

11. Exploring the Effect of the Nucleophosmin Inhibitor NSC348884 on Cervical Cancer HeLa Cells without G Protein Coupled Receptor Kinase 5: Effect on Cell Migration

- Presenting Author: Pamela Galinta (Roseman University)

Additional Author:

- Guadelupe Sanchez (Roseman University)
- Kim Ngan Bui (Roseman University)
- Courtney Wiseman (Roseman University)
- Christopher So (Roseman University)

Purpose

Even with a vaccine to prevent it, there is a need for more targeted therapeutic strategies for cervical cancer. NSC348884 is a novel small-molecule inhibitor of nucleophosmin (NPM1) that disrupts NPM1 oligomerization and may represent a promising targeted approach alone or in association with other chemotherapies. The efficacy of NSC348884 may be increased in cancer cells lacking G protein–coupled receptor kinase 5 (GRK5), a protein previously shown to interact with NPM1 and modulate its function in relation to controlling sensitivity to polo like kinase 1 inhibitors. Loss of GRK5 may alter NPM1 behavior towards pharmacologic inhibition by NSC348884. Therefore, we postulate that cervical cancer HeLa cells with low GRK5 may be more sensitive to this inhibitor. To test this hypothesis, this study aims to evaluate the effects of NSC348884 on cervical cancer cell migration behavior in the context of GRK5 deficiency.

Methods

Cervical cancer HeLa cells with decreased GRK5 protein expression were generated via stable transfection with GRK5-targeting shRNA. Cells stably expressing scrambled control shRNA or GRK5 shRNA were treated or not treated with NSC348884 overnight. Following treatment, 5,000–10,000 cells were seeded into the upper chamber of a Boyden chamber containing 10% fetal bovine serum (FBS). The lower chamber contained media supplemented with 20% FBS to establish a chemotactic gradient. Cells were allowed to migrate overnight. Then non-migrated cells were removed from the upper chamber using a cotton swab. Migrated cells on the lower surface were fixed with methanol, stained with crystal violet, washed, and counted. Data were expressed as the percentage of migrated drug-treated cells relative to untreated cells, and statistical analysis was performed using GraphPad Prism.

Results

Preliminary, our study with the serum- derived chemotactic gradient revealed no significant difference in migration between NSC348884-treated and untreated control shRNA HeLa cells. Similarly, no difference in migration was observed between treated and untreated GRK5 shRNA HeLa cells.

Conclusions

Thus far, migration assays using a fetal bovine serum- established chemotactic gradient demonstrated no effect of NSC348884 treatment on cervical cancer cell migration regardless of GRK5 expression status. Future studies will explore alternative chemoattractants and cellular behaviors (such as cancer cell invasion) to further assess the functional consequences of NPM1 inhibition in GRK5-deficient cells.

12. Exploring the Effect of the Nucleophosmin Inhibitor NSC348884 on Cervical Cancer HeLa Cells without G Protein Coupled Receptor Kinase 5: Effect on Cancer Cell Viability over Various Concentrations

- Presenting Author: Serena Jefferson (Roseman University)

Additional Author:

- Miranda White (Roseman University)
- Courtney Wiseman (Roseman University)
- Pamela Galinta (Roseman University)
- Christopher So (Roseman University)

Purpose

Nucleophosmin (NPM1) plays a critical role in the development and progression of several cancers, including cervical cancer. Therefore, it is possible that pharmacologic inhibition of this protein will negatively impact cancer cell survival and promote cell death. NSC348884 is an NPM1 inhibitor that specifically disrupts its oligomerization, thereby impairing its functional activity. Therefore, it is possible then that this drug can reduce cancer cell viability. Moreover, since G protein–coupled receptor kinase 5 (GRK5) functions as a regulatory interacting partner of nucleophosmin, it is possible that cells lacking GRK5 protein expression may have a different sensitivity to the toxic effect of this medication. Based on this, this study examines the effects of NSC348884 on cervical cancer cell viability across a range of treatment concentrations over 72 hours .

Methods

Cervical cancer HeLa cells with decreased GRK5 protein expression were generated via stable transfection with GRK5-targeting shRNA. Cells stably expressing scrambled control shRNA or GRK5 shRNA, plated at 50,000 cells per well, were treated or not treated with increasing concentrations of NSC348884 for 72 hours Cells were then collected and cell death was assessed by trypan blue exclusion. Statistical analysis was performed using GraphPad Prism.

Results

Preliminary, our study shows that this inhibitor is effective in killing nearly all HeLa cells after 72 hours starting at 1 microM. In particular, there is no difference in its effectiveness in killing HeLa cells that lack GRK5 expression.

Conclusions

So far, our studies suggest that this inhibitor does kill HeLa cells and that there is no difference, at the inhibitor concentrations tested, in its ability to kill these cells if they have or do not have GRK5 protein expression. Future studies will explore drug concentrations between 1 microM and 10 nM to determine further the dose dependency of this medication.

13. Exploring the Effect of the Nucleophosmin Inhibitor NSC348884 on Cervical Cancer HeLa Cells without G Protein Coupled Receptor Kinase 5: Effect on Cancer Cell Viability over Time

- Presenting Author: Zara Maissian (Roseman University)

Additional Author:

- Naomi Hernandez (Roseman University)
- Courtney Wiseman (Roseman University)
- Pamela Galinta (Roseman University)
- Christopher So (Roseman University)

Purpose

NSC348884 interferes with nucleophosmin (NPM1) oligomerization, thereby disrupting its activity. Given the established role of nucleophosmin in the progression of multiple malignancies, including cervical cancer, we propose that inhibition of this protein may alter cancer cell viability, leading to eventual cell death. Additionally, G protein–coupled receptor kinase 5 (GRK5) has been identified as a regulatory binding partner of nucleophosmin, suggesting that decreased GRK5 expression could modify cellular sensitivity to the effect of this drug. In this study, we look at the effect of NSC348884 on the cancer cell viability over a time course of 24 to 72 hours.

Methods

Cervical cancer HeLa cells with decreased GRK5 protein expression were generated via stable transfection with GRK5-targeting shRNA. Cells stably expressing scrambled control shRNA or GRK5 shRNA, plated at 50,000 cells per well, were treated or not treated with low (250 nM) or high (2.5 microM) concentrations of NSC348884 from 24 to 48 hours Cells were then collected and cell death was assessed by trypan blue exclusion. Statistical analysis was performed using GraphPad Prism.

Results

Preliminary, we see that very little toxicity is caused by the drug at the lower concentration. In fact, it appears that the maximum cell death has already happened after 24 hours. At the higher concentration that is only 10 fold higher than the low concentration, almost all cells, regardless of GRK5 expression, are dead. Similarly, maximum cell death is also achieved after 24 hours.

Conclusions

In this study, we report that this drug causes cell death but it appears to maximize after 24 hours. This occurs regardless of the cell line tested. It is unclear why there is no time dependent effect. Potentially, we may see a more time dependent effect between the 2 concentrations tested. Alternatively, this drug may not be stable past 24 hours under our treatment conditions.

14. Mechanisms of pain and defense during phonophobia after fluid percussion injury

- Presenting Author: Sahiti Annadata (Roseman University)

Additional Author:

- Ann Hoffman (UCLA)
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Purpose

Physical symptoms after traumatic brain injury (TBI) including post-traumatic headache and sensory sensitivity can influence emotional symptoms like anxiety and heightened defensive states. These interacting symptoms can lead to complex, chronic comorbidities that are difficult to treat. Calcitonin-gene related peptide (CGRP) is elevated in migraine and implicated in post-traumatic headache. CGRP signaling in amygdala circuits promote fear conditioning through transmitting nociceptive information. Altered CGRP signaling in sensory-emotional networks after TBI may underlie heightened pain and defensive states. We research to determine how traumatic brain injury alters CGRP-related neural activity in pain and defense circuits and whether these effects differ by sex.

Methods

In this study adult female and male rats received mild-moderate lateral fluid percussion injury (FPI) or sham surgery and tested for phonophobia 48h later with 75dB white noise. Brains were processed for c-Fos and CGRP immunohistochemistry and analyzed in the amygdala and periaqueductal gray (PAG).

Results

c-Fos was increased in the ipsilateral lateral amygdala in FPI groups, consistent with our previously published data and now replicated in females. In the ventrolateral PAG (vlPAG), a region that coordinates defensive freezing and pain inhibition, FPI groups had increased c-Fos in CGRP neurons compared to shams. We also found sex differences in sham groups where white noise increased vlPAG c-Fos and overall CGRP expression in females.

Conclusions

Our data suggest that TBI affects CGRP signaling in emotion and pain pathways that may contribute to sensory sensitivity and heightened defensive states.

15. Exploring the Effect of the Nucleophosmin Inhibitor NSC348884 on Cervical Cancer HeLa Cells without G Protein Coupled Receptor Kinase 5: Effect on Cancer Cell Adhesion Post Treatment

- Presenting Author: Cielo Angela Ebonia (Roseman University)

Additional Author:

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- Courtney Wiseman (Roseman University)
- Pamela Galinta (Roseman University)
- Christopher So (Roseman University)

Purpose

NSC348884 is a novel small-molecule agent that targets nucleophosmin (NPM1) by disrupting its oligomeric assembly. Since nucleophosmin is a key protein in the development of various cancers, including cervical cancer, we hypothesize that it may have an effect on cancer cell function. Furthermore, since G protein coupled receptor kinase 5 (GRK5) is a known protein interactor with nucleophosmin to control its activity, it is possible then that reduced expression of G protein–coupled receptor kinase 5 (GRK5) influences cell responsiveness to this inhibitor. In this study, we look at the effect of NSC348884 on the adhesion of cervical cancer HeLa cells on fibronectin- coated cell culture plate surfaces.

Methods

Cervical cancer HeLa cells with decreased GRK5 protein expression were generated via stable transfection with GRK5-targeting shRNA. Cells stably expressing scrambled control shRNA or GRK5 shRNA were treated or not treated with NSC348884 overnight and then replated the next day at 50-100,000 per fibronectin-treated well on a 96 well dish every 5 minutes to assess adhesion progression from 5 minutes to 40 minutes. After the last time point, unadhered cells are washed off, adhered cells are fixed by methanol, stained by crystal violet, washed again and crystal violet absorbance was measured by a plate reader. % absorbance was calculated relative to that of untreated cells. Statistical analysis was performed using GraphPad Prism.

Results

Preliminary, there appears that the treatment affects the adhesion of control shRNA cells more strongly than the GRK5 shRNA cells, with lower adhesion observed at the 5 minute time point for the control shRNA cells treated with this medication. This may suggest that the GRK5 shRNA cells, lacking GRK5 protein expression, may be less sensitive, not more, to the effects of this medication.

Conclusions

This study demonstrates that HeLa cell adhesion to fibronectin is altered in cells expressing GRK5, indicating a change in their initial ability to attach. These findings suggest that the

drug modulates NPM1-associated pathways that are involved in cell adhesion and that GRK5 could play a role in this particular process. Future studies will determine whether this drug similarly affects adhesion to other matrix components, such as collagen.

16. Exploring the Effect of the Nucleophosmin Inhibitor NSC348884 on Cervical Cancer HeLa Cells without G Protein Coupled Receptor Kinase 5: Effect on Cancer Cell Recovery and Colony Formation

- Presenting Author: Courtney Wiseman (Roseman University)

Additional Author:

- Matthew Thanh (Roseman University)
- Taryn Willingham (Roseman University)
- Pamela Galinta (Roseman University)
- Christopher So (Roseman University)

Purpose

NSC348884 is a recently developed nucleophosmin (NPM1) inhibitor that works by interfering with oligomerization of the protein. In this study, we test its effects in cervical cancer cells in terms of interfering with cancer cell growth and colony formation. Furthermore, we will study if this effect will vary in cells with low G protein coupled receptor kinase 5 (GRK5) expression level. This is because GRK5 has previously been demonstrated to interact with nucleophosmin. We hypothesize that there will be a change in sensitivity to the drug in these cells when GRK5 protein expression levels are decreased.

Methods

Cervical cancer HeLa cells with decreased GRK5 protein expression were generated via stable transfection with GRK5-targeting shRNA. Cells stably expressing scrambled control shRNA or GRK5 shRNA were treated or not treated with NSC348884 and then replated at 10,000 cells (to assess recovery after one week) or 1000 cells (to assess colony formation after 1 week). Following 1 week, cells seeded for recovery are collected by trypsinization and counted on an automatic cell counting machine or a manual hemocytometer. Cells seeded for colony formation post drug treatment are fixed by methanol, stained by crystal violet and finally the number of colonies formed and the number of cells per colony are counted under microscopy. For recovery, data was expressed as the percentage of the number of treated cells counted over number of untreated cells counted. For colony formation, data were expressed as the percentage of treated cells per colony ove untreated cells per colony. Statistical analysis was performed using GraphPad Prism.

Results

Preliminary findings indicate that GRK5 shRNA–expressing cervical cancer HeLa cells exhibit reduced recovery one week following treatment. This effect is not consistently observed in control shRNA cells, which has endogenous amounts of GRK5, suggesting increased cellular sensitivity to the drug when GRK5 expression is reduced.

Conclusions

In this study, decreased one-week recovery was observed in GRK5 shRNA cells following treatment. These results suggest that loss of GRK5 expression may enhance cellular

sensitivity to this medication, raising the possibility that the drug could be more effective in cervical cancer cells with reduced GRK5 protein levels. Future studies will further characterize this effect by assessing recovery at additional time points post-treatment and evaluating long-term outcomes such as colony formation.

17. Targeting the JAK/STAT Axis with Baricitinib in Cervical Cancer HeLa Cells Lacking G Protein Coupled Receptor Kinase 2 or 3

- Presenting Author: Vincent Newland (Roseman University)

Additional Author:

- Christopher So (Roseman University)

Purpose

Constitutive activation of signal transducers and activators of transcription (STATs) is implicated in cancer progression, and baricitinib, a Janus kinase (JAK) 1/2 inhibitor, shows emerging anti-cancer potential as a downregulator of the JAK/STAT pathway. Because STATs can also be activated by certain G protein–coupled receptor kinases (GRKs), we investigated the effects of baricitinib in HeLa cells and how GRK2 or GRK3 protein expression knockdown influences toxicity, growth, colony formation, and migration.

Methods

Human cervical HeLa cell lines (control, GRK2 shRNA knockdown, GRK3 shRNA knockdown) were used as the experimental model. Cell viability was measured using the Dojindo Cell Counting Kit-8 assay after 72 hours of baricitinib treatment across a concentration gradient. Cell growth was measured after 1 week of treatment with 9.6 nM baricitinib (previously reported IC50) using a hemocytometer. Colony formation was assessed after 1 week of treatment with 9.6 nM baricitinib by counting colonies (defined as ≥4 cells) under a microscope. Plates were first fixed with methanol and stained using crystal violet. Cell migration was measured after 24 hours of treatment with 9.6 nM baricitinib; cells were then plated in a Boyden chamber and allowed to migrate towards 10 ng/mL Epidermal Growth Factor (EGF) for 1 day. Cells were subsequently fixed, stained with crystal violet, and counted under a microscope. Results were analyzed to compare baricitinib's effects on toxicity, growth, colony formation, and migration between control and GRK-knockdown cells. Statistical analysis was performed using the Student t-test with GraphPad Prism.

Results

HeLa cell viability was reduced only at the highest concentration of baricitinib tested (10 mM). At lower concentrations, GRK3 knockdown cells showed a statistically significant increase in growth relative to the control and GRK2 knockdown cell lines (9.6 nM; Control: 104 ± 12.2; GRK2: 88.5 ± 5; GRK3: 149.1 ± 12). Exposure to baricitinib decreased migration toward EGF across all HeLa cell lines, with GRK3 knockdown cells showing a statistically significant decrease relative to the control cell line (Control: 85 ± 12; GRK2: 73.7 ± 12; GRK3: 42.7 ± 16). Baricitinib treatment did not significantly reduce colony formation, and little difference was observed among the HeLa cell lines (Control: 94.5 ± 11.78; GRK2: 91.5 ± 1.5; GRK3: 80 ± 8.7).

Conclusions

In this study, we investigated the effects of baricitinib on HeLa cells with or without GRK2/3 knockdown. We found that baricitinib influenced toxicity, proliferation, and migration, and to a lesser extent, colony formation, in a context-dependent manner. The key result was that, following baricitinib treatment, GRK3 knockdown cells displayed increased growth but reduced migration, with no significant change in colony formation. These findings indicate that GRK2 and GRK3 differentially affect how HeLa cells respond to JAK/STAT inhibition and suggest that intact GRK2 signaling may drive the altered responses observed when GRK3 is lost.

18. Exploring Thymic Cancer Samples in TCGA: Identifying Calmodulin Mutations

- Presenting Author: Juan Carlos Pascal (Roseman University)

Additional Author:

- Brittany Gomez (Roseman University)
- Christopher So (Roseman University)

Purpose

Signaling pathways contributing to thymic cancer pathogenesis remain not well defined, particularly those involving G protein–coupled receptor kinases (GRKs). Given their role in modulating receptor signaling and cellular homeostasis, understanding how GRK activity is altered in this form of cancer could be important . In this study, we utilized The Cancer Genome Atlas (TCGA) thymic epithelial tumor dataset to identify mutations in GRKs and GRK-associated proteins. We further integrated these findings with STRING protein–protein interaction analysis to identify mutations with potential functional relevance to GRK activity.

Methods

We analyzed the TCGA thymic epithelial tumor dataset to catalog and classify somatic mutations present across samples. The most frequently mutated proteins were identified and cross referenced with the top 100 interactors of each GRK (1-7) identified by STRING. Mutations within overlapping proteins were further characterized.

Results

Analysis of 113 thymic cancer samples from TCGA revealed no mutations within GRK family members. However, several mutated proteins identified in TCGA demonstrated known interactions with GRKs based on STRING analysis. Among these, calmodulin is of interest considering they are known to modify GRK activity. These mutations were prioritized for further investigation.

Conclusions

Although no GRK mutations were identified in TCGA thymic cancer samples, calmodulin mutations were observed. These mutations may have functional implications for GRK regulation, from modifying GRK ability to phosphorylate activated receptors and non-receptor proteins. Future studies will evaluate the effects of these calmodulin mutations on GRK function using in vitro and cellular models.

19. Qualitative Binding Kinetics for Antitrypanosomal Drug Discovery

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Purpose

Potential medicines that have good activity in certain stages of the discovery process often fail later steps, due to increasing biological complexity from proteins to cells to organisms. Increasing the time an antiinfective molecule binds to its target leads to not only increased pathogen cell death, but also decreased off-target effects, as well as better metabolism and excretion profiles. Nevertheless, experiments to test pseudoirreversibility are costly, especially when most compounds won't exhibit this behavior. We have adapted a four-point assay to qualitatively and rapidly check for slow-binding early in the discovery process. As a case study, we used the process to examine inhibitors of glycogen synthase kinase (GSK) from Trypanosoma cruzi, causative agent of Chagas disease.

Methods

This screen is conducted concurrent or postcurrent to a single-point molecular library testing. This four-point method employs high- and low- concentrations of substrate to examine competitiveness and 0- and 30- minute preincubation of molecule with protein to examine slow-binding. This identifies compounds to follow-up with more sophisticated binding kinetics experiments.

Results

Our assay distinguished a few slow binders, including human GSK inhibitor TUN-00001, as well as non-GSK-targeting molecules TUN-00004 and TUN-00066. Other compounds exhibited rapid equilibrium kinetics, with several possessing micromolar potency. Follow up kinetic assays confirmed slow-binding of the hits.

Conclusions

This slow-binding activity may have been missed in canonical inhibitor screens, and our results support a rapid screen for binding kinetics early on. Next steps will include microbiological screens of slow binders. We recommend this paradigm, used concurrent or postcurrent to single-point inhibitor screens for programs focused on small molecules for infectious disease. Early identification of slow-binding molecules can expedite the discovery process for diseases where research resources are limited.

20. Exploring the Relationship between JAK and G Protein Coupled Receptor Kinase 2 in Thyroid Cancer

- Presenting Author: Kristoffer Del Rosario (Roseman University)

Additional Author:

- Dylan Araque (Roseman University)
- Christopher So (Roseman University)

Purpose

Querying protein–protein relationships involved in thyroid cancer development and progression is essential for understanding how this disease evolves and may help identify potential therapeutic targets. One protein whose function in cancer development is unclear is the G protein coupled receptor kinase 2, whose expression is upregulated in thyroid cancer. In this study, we investigated potential associations between Janus kinase (JAK)–related proteins, a key pathway in cancer development, and GRK2.

Methods

STRING (string-db.org) was used to identify the top 100 proteins associated with JAK signaling. The Human Protein Atlas (proteinatlas.org) was queried to assess expression patterns of these proteins in thyroid cancer samples. Protein expression levels of the identified proteins were compared against that of GRK2 to evaluate potential correlations. Coefficient of determination (R^2) analysis was performed to identify the strongest expression correlations. Top 10 proteins with the highest overall correlations were further analyzed to observe changes in expression correlations with GRK2 after stratifying samples by cancer stage.

Results

Preliminarily, most of the proteins we queried demonstrated weak correlations with GRK2 expression. The mean R^2 value across all analyzed proteins was 0.1111. Among the 100 JAK-associated proteins, several displayed stronger associations with GRK2 than the overall cohort. For example, PTPN6 (Protein Tyrosine Phosphatase Non-Receptor Type 6), an enzyme normally involved in immune responses, exhibited the strongest overall correlation with GRK2 expression in the thyroid samples ($R^2 = 0.476$). When stratified by stage, PTPN6 remained the most strongly correlated protein in stage I and II samples ($R^2 = 0.471$). In contrast, GRB2, an adaptor protein within the MAPK pathway, demonstrated the strongest correlation with GRK2 expression in stage III and IV samples ($R^2 = 0.524$).

Conclusions

This study evaluated relationships between GRK2 expression and proteins within the JAK signaling network in thyroid cancer. Although overall correlations were low when you account for all the samples, some proteins demonstrated stronger associations with GRK2,

particularly at later stages of disease. These results suggest that GRK2 may function within JAK-related signaling pathways during thyroid cancer progression.

21. Querying the Relationship between Wnt- Associated Proteins and GRK5 in Breast Cancer

- Presenting Author: Hanna Wing (Roseman University)

Additional Author:

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- Christopher So (Roseman University)

Purpose

Characterizing protein–protein relationships involved in breast cancer is essential for understanding how this disease progresses. In this study, we investigated potential associations between Wnt pathway–associated proteins and G protein–coupled receptor kinase 5 (GRK5), a protein reported to be upregulated in breast cancer with poor survival rates.

Methods

STRING (string-db.org) was used to identify the top 100 proteins associated with Wnt5a signaling. The Human Protein Atlas (proteinatlas.org) was utilized to evaluate protein expression of these proteins in breast cancer samples and correlate them to that of GRK5. Coefficient of determination (R^2) analysis was performed to identify the strongest associations among these samples. Wnt5a related proteins with the highest overall correlations were further studied for protein- GRK5 correlation after stratifying the breast cancer samples based on estrogen receptor (ER) and progesterone receptor (PR) statuses.

Results

Of the 100 proteins identified to be best linked to Wnt5a by STRING, all the proteins demonstrated weak correlations with GRK5 protein expression. The mean R^2 value across all analyzed proteins was 0.023 with MCAM (Melanoma Cell Adhesion Molecule also known as CD146 or MUC18), a cell-surface glycoprotein important for cell adhesion, exhibiting the strongest overall correlation with GRK5 expression (R^2 = 0.179). When we stratified the breast cancer samples by their ER and PR statuses, we actually reduced the R2 for the top five Wnt5a associated proteins with the best overall correlation to GRK5. Notably, the R^2 value for MCAM was reduced to 0.1 across all categories (PR negative and positive. ER negative and positive).

Conclusions

In this report, evaluated the relationship between GRK5 protein expression with that of proteins within the Wnt signaling network in breast cancer. Overall, all protein expression correlations were weak but a couple Wnt-associated proteins showed modest correlations with GRK5. Stratification by ER and PR status did not improve correlations but, in fact, reduced them. More alternative subgroup classifications like when a sample is both PR+ and ER+, could improve correlations potentially.

22. Querying the Relationship between B-Raf and G Protein Coupled Receptor Kinase 2 in Melanoma

- Presenting Author: Syed Husain (Roseman University)

Additional Author:

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- Christopher So (Roseman University)

Purpose

Understanding the relationships between proteins involved in melanoma is critical for uncovering its mechanisms for its development. In this study, we investigated potential connections between proteins within the B-Raf protein network and G protein Coupled Receptor Kinase 2 (GRK2), both of which are notable for their involvement in the development of melanoma but have yet to be connected.

Methods

2 key databases were utilized: STRING (STRING-db.org) was used to identify the top 100 proteins associated with B-RAF and the Human Protein Atlas (proteinatlas.org) was queried for protein expression within its studied melanoma samples. Protein expression of B-RAF related proteins were compared with that of GRK2 to assess potential correlations. Coefficient of determination (R^2) analysis was performed to identify the associations. Those 10 GRK2-protein interactions with the highest correlations were further analyzed after stratifying samples based on patient survival (alive versus deceased).

Results

Most of the 100 B-RAF- associated proteins studied so far demonstrated weak correlations with GRK2 expression. The mean R^2 value across all analyzed proteins was 0.034. Of these proteins, ARRB1 exhibited the strongest overall correlation with GRK2 protein expression ($R^2 = 0.264$). When the overall top ten GRK2-correlated proteins re-examined for their correlation in the same patient samples categorized by their survival status, the ARRB1 correlation decreased in deceased patients, whereas the correlation between GRK2 and GNA11 increased nearly twofold in deceased samples compared with that found when encompassing the overall cohort.

Conclusions

This study evaluated relationships between GRK2 protein expression and proteins within the B-RAF signaling network in melanoma. Although overall correlations were low, select G protein–related signaling proteins, including ARRB1 and GNA11, demonstrated stronger associations with GRK5. For GNA11 this was actually increased when deceased patient samples were evaluated on its own. Overall, these findings suggest that the signaling network involving the G protein–coupled receptors, potentially involving melanocortin-related pathways, may contribute to melanoma.

23. Querying the Relationship between G Protein Coupled Receptor Kinase 5 and Alpha Cardiac Actin-1 (ACTC1) Network in Ovarian Cancer

- Presenting Author: Ava Ghayour (Roseman University)

Additional Author:

- Jamie Khuong (Roseman University)
- Christopher So (Roseman University)

Purpose

Understanding the relationships between proteins involved in ovarian cancer is critical for effective treatment. A proposed biomarker for ovarian cancer, Alpha Cardiac Actin-1 (ACTC1), has recently been found to co-overexpress with G protein Coupled Receptor Kinase 5 (GRK5). In this study, we investigated the potential correlation with GRK5 and proteins within the ACTC1 network or proteins.

Methods

2 key databases were used in our study: STRING (STRING-db.org) was used to identify the top 100 proteins associated with ACTC1. The Human Protein Atlas (proteinatlas.org) was utilized for information on protein expression of key proteins in ovarian cancer samples. Protein expression levels of ACTC1-associated proteins were compared with that of GRK5 to assess potential correlations. Coefficient of determination (R^2) analysis was calculated to identify the strongest GRK5-associated correlations. Top 10 proteins with the highest correlations with GRK5 were further examined after stratifying samples by patient age (≤54 years and ≥55 years).

Results

Most proteins studied so far demonstrated weak correlations with GRK5 expression, with the mean R^2 value across all GRK5-associated proteins being 0.0335. Of these proteins, FBN1 (Fibrillin-1, a protein involved in connective tissue elasticity) exhibited the strongest overall correlation with GRK5 expression (R^2 = 0.206). When the top ten overall GRK5-correlated proteins were re-examined in samples stratified by age, a notable correlation increase was observed between GRK5 and GATA4, a transcription factor, which increased from 0.108 in the full dataset to 0.289 in samples from patients aged 54 years and younger. In contrast, GATA4- protein correlation decreased to 0.047 in samples from patients aged 55 years and older.

Conclusions

This study evaluated protein expression relationships between GRK5 and members within the ACTC1 interaction network in ovarian cancer. Although overall correlations were low, there were some ACTC1-associated proteins that demonstrated stronger associations with GRK5, some of which increased significantly when accounting for age of the sample, such as

GATA4. This suggests that age may influence GRK5 involvement within the ACTC1 protein network.

24. Using C. elegans as an experimental model to test the significance of G-protein coupled receptor kinase-2 during animal development in response to excess glucose

- Presenting Author: Elexis Sambo (Roseman University)

Additional Author:

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Purpose

The immediate and long-term impact of excessive glucose exposure on organismal growth is not well understood. In this study, we utilize the model organism Caenorhabditis elegans to assess the impact of high-glucose conditions on growth. Specifically, we examined the role of G protein–coupled receptor kinase 2 (GRK2) in mediating growth responses to excess glucose since it may interact with insulin receptors.

Methods

Two (designated L4 in our study) or three-day-old (designated adults in our study) C. elegans (wild-type N2 or GRK2 knockout) were cultured on nematode growth media (NGM) plates with or without 400 mM glucose. Organism size was measured in animals grown from egg to the L4 larval stage or to adulthood under control or high-glucose conditions. Measured body lengths, measured under microscopy, were recorded and statistical analysis was performed using graphpad prism.

Results

Exposure to glucose produced some differents effects on organism size in wild-type and GRK2 knockout C. elegans. When length is measured during their L4 stage, GRK2 knockout animals grown in high-glucose conditions were smaller than their non–glucose-exposed counterparts. This size reduction when grown in high glucose was not observed in wild-type N2 animals at this stage. In adult worms, both wild-type and GRK2 knockout animals grown in glucose exhibited reduced body size compared with all animals grown without glucose on NGM plates.

Conclusions

This study demonstrates that the effects of high-glucose exposure may vary in a developmental stage-dependent manner. In the adult stage, GRK2 may not play such a protective role since both animals, knockout or wild type, were smaller in high glucose. A smaller GRK2 loss of function animals in the L4 stage suggests enhanced sensitivity to glucose, potentially keying on GRK2 as a protein that protects the organism from excessive glucose during early stage development. Whether this is related to the insulin receptor pathway is unclear.

25. Using C. elegans as an experimental model to test the significance of G-protein coupled receptor kinase-2 during animal reproduction in response to excess glucose

- Presenting Author: Marc Magpily (Roseman University)

Additional Author:

- Mackenzie Zarriello (Roseman University)
- Christopher So (Roseman University)

Purpose

The immediate and long-term effects of excessive glucose exposure on development and reproduction of organisms remain not well understood. Better understanding of this could help predict the long term impact of excessive sugar indulgence at an early age. In this study, we utilized the model organism Caenorhabditis elegans to examine how early-life exposure to high-glucose conditions influences reproductive output. Specifically, we investigated the role of G protein–coupled receptor kinase 2 (GRK2), a kinase that may interact with insulin signaling pathways, in potentially contributing to excessive glucose effects.

Methods

Three-day-old (adult-stage) C. elegans (wild-type N2 or GRK2 knockout) were cultured on nematode growth media (NGM) plates with or without 400 mM glucose. For the glucose-exposed animals, they were initially grown from eggs on glucose-supplemented NGM plates with OP50 as the food source for 24 hours to ensure high glucose exposure during the L1 developmental stage. Animals were then transferred to glucose-free NGM plates with OP50 and allowed to grow for an additional two days to reach adulthood (roughly at 3 days from egg hatching). On the day of the experiment, 4 adult animals were placed on fresh, glucose-free NGM plates with OP50 and eggs laid were counted after one hour and again overnight. Eggs and larvae were counted and added together as eggs. The number of eggs were then normalized to the number of adult animals to calculate eggs laid per adult, with statistical analysis performed using GraphPad Prism.

Results

Glucose exposure during early development produced C. elegans strain-specific effects on egg-laying behavior. Wild-type N2 animals laid a similar number of eggs during the first hour regardless of prior glucose exposure. In contrast, GRK2 knockout animals that were previously exposed to glucose at the L1 stage exhibited a delay in egg laying during the first hour, resulting in fewer eggs laid. When egg laying was assessed overnight, no differences were observed among all treatment groups.

Conclusions

These findings indicate that early-life exposure to high-glucose conditions affects reproductive timing in a genotype-dependent manner. The delay observed in the loss of GRK2 animals suggests a role for GRK2 in adapting reproductive behavior in animals grown in glucose at an early stage of their development. Potentially, the mechanism of the animal that recognizes sensory cues to encourage egg laying may have been affected by glucose exposure during their early development. Further studies are needed especially those involving exposing the animal to glucose at different developmental stages.

26. Using C. elegans as an experimental model to test the significance of G-protein coupled receptor kinase-2 in fat deposition in response to excess glucose

- Presenting Author: Angela Chiao (Roseman University)

Additional Author:

- Alyssa Caronia (Roseman University)
- Christopher So (Roseman University)

Purpose

The immediate and long-term effects of excessive glucose exposure throughout development of the organism to adulthood could be better understood in order to determine its impact on over health and well being.. In this study, we used the model organism Caenorhabditis elegans to examine how development in a high-glucose environment influences fat accumulation. Specifically, we investigated the role of G protein–coupled receptor kinase 2 (GRK2), a protein kinase shown to affect the function of insulin receptors.

Methods

Wild-type N2 and GRK2 knockout C. elegans were grown from eggs on nematode growth media (NGM) plates with or without 400 mM glucose for 72 hours to ensure exposure throughout development. Animals were collected by aspiration, anesthetized with sodium azide, fixed with formaldehyde, permeabilized with 0.1% Triton X-100, treated with propanol for proper solubility of oil red, and stained with Oil Red O and then washed.. Stained animals were then imaged using light microscopy and a microscope camera, and ImageJ was used to quantify total body area and lipid-red stained area. Fat accumulation was expressed as the ratio of lipid-stained area to total body area of the animal in arbitrary units. Statistical analysis was performed using GraphPad Prism.

Results

All animals examined to date demonstrated successful Oil Red O staining, with noticeable staining in the intestinal area of the C. elegans, which has been shown elsewhere. Furthermore, ImageJ can be used for sizing of both the lipid-stained surface area and the whole animal. Preliminary analysis of a single animal per treatment group show a reduction in lipid staining intensity in glucose-fed animals compared with controls. Additional animals will be analyzed to validate these initial observations.

Conclusions

Thus far, we see that both animals are stained red with noticeable staining in the intestinal area of the C. elegans. Future work will involve quantifying more animals for the size of red lipid staining compared to the whole animal.

27. Effectiveness of a Hybrid Closed Loop System VS Parental Management in Pediatric Type 1 Diabetic Patients

- Presenting Author: Dakota Campbell (Touro University)

Additional Author:

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- Makenzie Craig (Touro University)
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- Nicole Hang (Touro University)

Purpose

The objective of this review is to assess the effectiveness of a HCL system versus non-HCL parental management in pediatric type 1 diabetic patients as reflected in health outcomes. Outcomes of interest are the maintenance of target glycemic levels, HbA1c levels, hypoglycemic incidence, nocturnal glycemia, and prevalence of depression/anxiety among caregivers and patients.

Methods

The studies included are those conducted with patients under the age of 18 with a previous diagnosis of T1DM who are using a HCL system as compared to those who are using caregiver managed standard therapy which may include multiple daily injections and non-HCL technologies. We excluded studies with patients older than 18 years of age or those without a diagnosis of T1DM, as well as studies assessing the effectiveness of a fully closed-loop system due to its novelty and limited body of research

Results

Overall, our preliminary data found that HCL systems have positive effects for pediatric patients, with some of the largest effects being on time in range (TIR). Those being treated with a HCL spent more time in target range and had lower HbA1c values. Differences were also noted in nocturnal blood glucose control. Mental health effects were also observed in the literature, with the most impactful outcomes being lessened feelings of stress and anxiety among caregivers.

28. Unraveling NAD Homeostasis in Pathogenic Fungi and Therapeutic Implications

- Presenting Author: Taylor Webb (Touro University)

Additional Author:

- Syed Naqvi (Touro University)
- Brad Haubrich (Touro University)

Purpose

Nicotinamide adenine dinucleotide (NAD) and its phosphorylated form NADP are universally conserved cofactors essential for redox metabolism, energy homeostasis, and cellular signaling across all domains of life. NAD metabolism has been extensively characterized in mammals and plants. However, NAD metabolism, functional diversity, and therapeutic relevance in fungi remain comparatively underexplored, despite the growing global burden of invasive and drug-resistant fungal infections recently prioritized by the World Health Organization.

Methods

To address this, we have developed search parameters for PubMed and Google Scholar, and we conducted a comprehensive literature review of the fungal NADome, synthesizing current knowledge and state of the field, highlighting conserved and divergent NAD biosynthetic, salvage, and recycling pathways across major fungal phyla, with emphasis on pathogenic species.

Results

Our survey of recent literature revealed substantial pathway diversity among fungi, including distinct precursor utilization, enzyme repertoires, and NAD-dependent regulatory roles in stress responses, virulence, and cellular survival. While NAD-targeting strategies have been increasingly investigated in Candida species, NAD metabolism in other pathogenic fungi, such as Aspergillus and Coccidioides, remains largely uncharacterized, representing a significant gap in antifungal research.

Conclusions

Collectively, these findings indicate that the fungal NADome is both functionally versatile and evolutionarily diverse, and distinction from mammalian pathways suggest druggability of fungal NAD metabolism. This study underscores potential of NAD-related pathways as targets for antifungal agents to help to address the growing global concerns of drug-resistant fungal infections.

29. Don’t Cell Yourself Short: Repurposing Antivirals to Inhibit Acanthamoeba Growth

- Presenting Author: Ashmeet Ghotra (Touro University)

Additional Author:

- Anna Yang (Touro University)
- Quang Ha (Touro University)
- Alexandra Yokomizo (Touro University)
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Purpose

Acanthamoeba keratitis (AK) is an opportunistic infection caused by Acanthamoeba castellanii, which can also cause granulomatous encephalopathy in patients experiencing immunodeficiency. Despite low resources to find new drugs, we need new antiamoebic agents in the armamentarium. One strategy for drug discovery where resources are low is repurposing molecules, or screening compounds discovered for other diseases. Since proteases are known to play a role in AK pathogenesis, we employed a drug repurposing strategy for protease inhibitors.

Methods

First, we developed phenotypic assays for A. castellanii suitable for high-throughput screening. We adapted an endpoint Resazurin fluorescence assay in a 96-well format, using YPG media supplemented for amoeba. Next, bioactivities of known protease inhibitors were tested at 20 μM, using a small panel of compounds with reported activities against a myriad of implications, including ischemia, AIDS, and Covid-19.

Results

This screen identified growth inhibitors bearing diverse pharmacophores. Follow up of a few of these compounds revealed an IC50 for TUN-00065, a calpain inhibitor, to be about 5 μM. Preliminary morphological analysis suggested compromised cell wall upon treatment with TUN-00065, while cells treated with TUN-00064, a SARS-CoV-2 Mpro inhibitor, appeared especially vacuolar. Follow-up screens identified synergy of protease inhibitors with various antiparasitic agents. Four putative Acanthamoeba homologs were aligned with human calpains, demonstrating 5-25 percent identity with human homologs.

Conclusions

These results suggest protease inhibitors may be a new area for therapeutic or prophylactic interventions against AK. Next steps include in vitro screening of amoeba proteases to complement our phenotypic screens.

30. Can We Repurpose Oncology Molecules for Acanthamoeba keratitis?

- Presenting Author: Anna Yang (Touro University)

Additional Author:

- Ashmeet Ghotra (Touro University)
- Quang Ha (Touro University)
- Alexandra Yokomizo (Touro University)
- Brad Haubrich (Touro University)

Purpose

Acanthamoeba castellanii is a free-living protist that can cause an opportunistic infection. Most commonly, it causes Acanthamoeba keratitis (AK), but it can also cause disseminated infection and granulomatous encephalopathy. Treatment is difficult, with a long course of antiparasitic therapy and risk of blindness, and new interventions are needed. Protein kinase inhibitors are well known in oncology, and these could be repurposed as antiamoebic agents. To this end, we screened PKIs against A. castellanii cultures. The inhibitor library was small, but there was chemodiversity among the tested molecules. Trophocidal activity of the PKIs was assessed with a Cell Titer Glo (Promega, Madison WI) assay using modified YPG media, and Resazurin fluorescent assays confirmed hits.

Methods

The inhibitor library was small, but there was chemodiversity among the tested molecules, curated from AOBIOUS, Sigma Aldrich, and Fisher Scientific. Trophocidal activity of the PKIs was assessed with a Cell Titer Glo (Promega) assay using modified YPG media, and Resazurin fluorescent assays confirmed hits.

Results

Initial 20 μM PKI screen identified several inhibitors of trophozoite growth. Follow-up dose response investigation of some PKIs revealed IC 50 s in the micromolar range for compounds TUN-00048 and TUN-00055, respectively. Interestingly, these compounds are known to inhibit human receptor tyrosine kinases, though other tyrosine PKIs in the panel were not as potent. Amino acid alignment of two putative tyrosine kinases from A. castellanii on UniProt were found to share approximately 27 percent identity with Abl1 and Abl2. These findings support the potential utility of repurposing PKIs as therapeutic agents against Acanthamoeba keratitis.

Conclusions

Further studies are needed to expand the compound library and to clone and express A. castellanii tyrosine kinases for detailed structure-activity relationship and selectivity profiling. Such work could lay the foundation for novel, targeted therapies for this difficult-to-treat infection.

31. Surgical Intervention and Developmental Outcomes in Patients with Crouzon's Syndrome

- Presenting Author: Jill Sukraw (Roseman University)

Additional Author:

- Dr. Val Joseph Cheever (Roseman University)

Purpose

Crouzon syndrome is a craniosynostosis disorder characterized by premature fusion of cranial sutures, resulting in midfacial hypoplasia, shallow orbits, and functional impairments involving airway patency, vision, occlusion, and intracranial pressure. Midface deficiency is among the most clinically significant features and frequently requires staged surgical intervention during childhood or adolescence. Early diagnosis and appropriate surgical timing are critical, as progressive cranial restriction may lead to neurodevelopmental compromise and elevated intracranial pressure.
Surgical management aims to balance functional improvement with facial aesthetics. While early intervention may alleviate airway and intracranial constraints, it has been associated with higher complication rates, necessitating individualized treatment planning. Midface advancement procedures, including Le Fort III osteotomy and distraction osteogenesis, have demonstrated predictable skeletal correction and improvements in airway and ocular function. Advances in surgical algorithms and outcome assessment underscore the importance of multidisciplinary, longitudinal care in optimizing long-term functional and skeletal outcomes for patients with Crouzon syndrome.

Methods

This literature review synthesized findings from peer-reviewed publications addressing surgical timing, midfacial advancement techniques, craniometric and aesthetic outcomes, airway changes, orthodontic considerations, and long-term growth patterns in patients with Crouzon syndrome. The review was based exclusively on a predefined set of articles provided by the authors and included randomized studies, retrospective reviews, systematic reviews, surgical case reports, and long-term follow-up studies published between 1986 and 2025. Eligible studies included patients diagnosed with Crouzon syndrome or syndromic craniosynostosis with Crouzon features and evaluated surgical interventions such as cranial vault remodeling, Le Fort I or III advancement, monobloc distraction, rigid external distraction, and adjunctive orthognathic or airway procedures. Data extracted from each study included study design, patient characteristics, surgical techniques, outcome measures, and duration of follow-up. Primary outcomes of interest included craniometric and aesthetic changes, complication rates relative to surgical timing, airway dimension changes, postsurgical growth trends, and functional outcomes related to breathing, occlusion, and vision. Findings were organized into thematic domains encompassing surgical timing and complications, midfacial advancement outcomes, airway and respiratory effects, growth and development, aesthetic results, and syndrome-specific orthodontic considerations. A narrative synthesis approach was used to

integrate results across studies and identify consistent trends, variations, and methodological strengths or limitations.

Results

Fourteen peer-reviewed studies evaluating surgical and interdisciplinary management of Crouzon syndrome were analyzed. Despite methodological heterogeneity, consistent trends emerged across six major domains: surgical timing, midface advancement outcomes, airway function, craniofacial growth, aesthetic improvement, and orthodontic considerations. Earlier craniosynostosis repair was associated with higher postoperative complication rates, particularly in patients younger than six months, although delaying intervention increased risks of elevated intracranial pressure and airway compromise. Midface advancement—most commonly via Le Fort III osteotomy with or without distraction—produced consistent improvements in facial projection, orbital protection, occlusion, and airway patency. While partial relapse during growth was reported, postoperative facial harmony remained superior to preoperative baselines. Airway outcomes showed measurable increases in upper airway volume in pediatric patients and improved nasal airflow in adults following surgical intervention. Longitudinal studies demonstrated improved craniofacial growth trajectories after surgery, although intrinsic growth deficiencies persisted, often requiring staged procedures. Meta-analytic and cohort evidence confirmed significant aesthetic and craniometric improvements across techniques. Early orthodontic intervention was consistently identified as essential for optimizing surgical outcomes and occlusal development.

Conclusions

The literature demonstrates that optimal management of Crouzon syndrome requires a long-term, staged, multidisciplinary strategy tailored to patient-specific anatomical and functional needs. Early cranial vault expansion protects neurological development, while midface advancement profoundly improves airway function, occlusion, and facial balance. Long-term follow-up and orthodontic/orthognathic refinement are essential to address persistent growth deficiencies. Consistent evidence across decades shows that modern surgical interventions offer reliable aesthetic and functional improvement when carefully sequenced and integrated into comprehensive craniofacial care.

32. Enzalutamide resistance pathways in MDAPCa2b and LNCaP prostate cancer cells

- Presenting Author: Andrew Ramirez (Roseman University)

Additional Author:

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- Mira Han (University of Nevada, Las Vegas)
- Ranjana Mitra (Roseman University)

Purpose

Prostate cancer is one of the leading causes of cancer-related deaths in men, with African Americans (AA) disproportionately affected compared to Non-Hispanic White Americans (NHWA). Enzalutamide—a second-generation androgen receptor inhibitor—is a key therapy used to treat advanced metastatic prostate cancer; however, acquired resistance contributes to treatment failure and poorer outcomes. Prior RNA-sequencing-based transcriptomic profiling of enzalutamide-resistant (Enz-R) derivatives from AA-origin MDAPCa2b and NHWA-origin LNCaP cells revealed two distinct resistance programs: a survival-optimized, apoptosis-resistant, and metabolically repressed phenotype in MDAPCa2b-EnzR cells, and a proliferative, DNA-repair-enhanced phenotype in LNCaP-EnzR cells. Building on these findings, this study investigates the molecular and genetic mechanisms underlying these resistance programs in MDAPCa2b and LNCaP models to characterize lineage-specific resistance behaviors and identify potential therapeutic targets.

Methods

To evaluate gene-expression changes underlying enzalutamide resistance between AA- and NHWA-origin cell lines, resistant derivatives of MDAPCa2b and LNCaP cell lines were generated and maintained in continuous enzalutamide (MDAPCa2b Enz-10μM and LNCaP Enz-8μM). qRT-PCR and Western blotting of representative genes involved in apoptosis, metabolism, cell-cycle control, DNA-repair, and AR-signaling pathways will quantify mRNA expression and demonstrate corresponding protein-level changes. Apoptosis will be assessed using the Annexin V-FITC/PI reagent followed by flow cytometry to compare resistance-associated apoptotic differences between Enz-R cell lines and native parental cells (maintained in DMSO). Cellular growth and proliferation will be evaluated using MTT assays, clonogenic assays, BRdU incorporation, and Ki67 staining.

Results

Work in progress

Conclusions

Work in progress

33. Selective Antitumor Effect of LSD1 Inhibition in Rhabdoid Tumors

- Presenting Author: Mikaella Balos (Roseman University)

Additional Author:

- Maleah Agarma (Roseman University)
- Justin Vang (Roseman University)
- Rebecca Lim (Roseman University)

Purpose

Rhabdoid tumors are rare and aggressive tumors that commonly occur in infants and young children. There is no defined standard of care, and the patients overall have a poor prognosis. When the tumors develop in the brain and spinal cord, they are referred to as atypical teratoid rhabdoid tumors (ATRTs). A rhabdoid tumor that grows in the kidneys and soft tissues is called a malignant rhabdoid tumor (MRT). Our lab has recently observed that LSD1 inhibition selectively inhibits the growth of G401 malignant rhabdoid tumor cell lines. LSD1 is a multifunctional demethylase that regulates gene expression by removing methyl groups from mono- and di-methylated H3K4. Additionally, it also regulates the activity and stability of key non-histone proteins, such as SMARCC1 and EZH2, through site-specific demethylation. LSD1 is essential for pluripotency and self-renewal of embryonic stem cells, and it has been reported to be overexpressed in rhabdoid tumors. Our lab will characterize the selective antitumor effect of LSD1 inhibition in rhabdoid tumors and investigate the mechanisms by which inhibition of LSD1 suppresses the growth of rhabdoid tumors.

Methods

Cell lines: HCT116 and G401 are a generous gift from our collaborators, Drs. Hui Zhang and Hong Sun at UNLV. A204 and CHLA-06-ATRT are obtained from ATCC. All cells are maintained in RPMI, McCoy's, or DMEM: F-12 medium supplemented with 10% FBS and 1% antibiotics.

Drug compounds: Dimethyl sulfoxide (DMSO) is used as a negative control. Cisplatin and doxorubicin are used as a positive control. Three different LSD1 inhibitors are to be tested: GSK-LSD1 and LSD1i-IV are purchased from Millipore Sigma, and a novel compound, CBB-2026, is provided by the collaborators, Drs. Hui Zhang and Jun Kang at UNLV.

Growth inhibitory assays: Actively growing HCT116, G401, A204, and CHLA-06-ATRT cells (30-50% confluent) are treated with DMSO or with various concentrations of drug compounds listed above for 48-96 hours. Cells are harvested by trypsin digestion and counted in technical triplicate using a hemocytometer, an EVE automatic cell counter, and/or a CCK-8 kit. The differences between control and drug compounds are compared and plotted. Experiments are conducted in biological triplicate.

Results

Work in progress

Conclusions

Work in progress

34. A Virtual Reality Paradigm for Understanding Nicotine Context Associations

- Presenting Author: Zinnia Saha (Roseman University)

Additional Author:

- Seetha Krishnan (University of Chicago)
- Mark Sheffield (University of Chicago)

Purpose

The hippocampus is important for the formation of drug-place associations. Specifically, a subset of cells called place cells that encode memories of places visited may play a vital role. However, exactly how place cells encode places in which drugs are consumed compared to natural rewards remains unclear. We hypothesized that since drugs are a stronger reward, place cells encoding environments with a drug reward may exhibit greater spatial encoding properties than environments with a water reward.

Methods

We hypothesized that since drugs are a stronger reward, place cells encoding environments with a drug reward may exhibit greater spatial encoding properties than environments with a water reward. We selected nicotine as our drug and two-photon microscopy to image from large populations of hippocampal cells expressing calcium indicators in awake, behaving mice. Two-photon microscopy requires mice to be head-fixed to minimize head movements, therefore, we used a paradigm where head-fixed mice navigate virtual reality (VR) environments via a treadmill. Mice were conditioned with oral nicotine reinforcement in one VR and water in a separate VR on alternating days. Following ten days, mice were given a preference test, by placing them in each VR in a counterbalanced manner without reward.

Results

We found that mice explored the nicotine-VR more than the water-VR, suggesting that nicotine is a stronger reward. We imaged from hippocampal cells during the preference test and found that, contrary to our hypothesis, place cells in the nicotine-VR were more impoverished compared to the water-VR.

Conclusions

This data suggests that place cells may not encode environments with greater rewards with improved spatial encoding properties. We posit that the absence of nicotine from the environment during the preference test disorganized place cells more than the absence of the water reward. Future work imaging place cells during nicotine vs water conditioning and during the preference test will determine if this is indeed true.

35. Kinase-Targeted Therapeutic Approaches in Hepatocellular Carcinoma

- Presenting Author: Elizabeth Bondurant (Roseman University)

Additional Author:

- Baunya Young (Roseman University)
- Dr. Surajit Dey (Roseman University)

Purpose

Hepatocellular carcinoma (HCC) is a common malignancy that represents the 9th leading cause of cancer deaths in the United States. Progression of HCC, as well as the development of liver tumors, is largely modulated by the immune system and ABL1, or proto-oncogene 1, a gene that is consistently over-expressed in HCC. Asciminib, sold under the brand name Scemblix, is a medication used to treat Philadelphia chromosome-positive chronic myeloid leukemia. Asciminib is a novel allosteric tyrosine kinase inhibitor (TKI) that primarily targets the abnormal BCR-ABL-1 protein, which drives rapid tumor cell growth and proliferation. Unlike other TKIs indicated for advanced HCC (including sorafenib, lenvatinib, and donafenib), asciminib's mechanism of action significantly differs. Absciminib is a STAMP inhibitor that uniquely targets the ABL Myristoyl Pocket of the BCR-ABL1 protein, locking the binding site in an inactive state and making it effective against some TKI mutations. TKI mutations represent significant challenges in the treatment of HCC with other, more prevalent TKIs.

Methods

We conducted a PubMed literature search to identify studies on targeted therapies for hepatocellular carcinoma (HCC). Asciminib is a selective protein kinase inhibitor, and was used as a conceptual example of a targeted therapy due to it being selectively targeted for disease associated signaling pathways. To explore its potential effects on HCC, we plan to test cell viability using HCC cell lines, with an MTT assay. Cells will be treated with different concentrations of asciminib, and the MTT assay will measure the number of metabolically active cells by detecting the conversion of MTT to formazan. This will help us evaluate any potential off-target effects of the drug.

Results

Research in progress; data not yet available.

Conclusions

Although this research is still in progress, asciminib represents a potential targeted therapy for hepatocellular carcinoma due to the overexpression of ABL1 in HCC. Its unique mechanism of action distinguishes it from other tyrosine kinase inhibitors currently used in treatment. The overexpression of ABL-1 in HCC suggests that asciminib may be an effective

means of preventing tumor cell division and growth, ultimately improving patient outcomes.

36. Predicting Alternative Transcription Start Site (TSS) Usage: Understanding the 'Language' of Transcriptional Regulation

- Presenting Author: Daniel Witoslawski (University of Nevada, Las Vegas)

Additional Author:

- Mingon Kang (University of Nevada, Las Vegas)
- Mira Han (University of Nevada, Las Vegas)

Purpose

SOTA models for predicting transcriptomic and epigenomic assays struggle to effectively incorporate patterns from distal (far away) regions despite wide receptive fields. It has been proposed that this is a class imbalance problem. We aim to solve the class imbalance problem by manually extracting candidate elements from the raw sequence. We hypothesize that incorporating RNA-Seq data of the promoter for each gene increases model performance in predicting transcription start site (TSS) usage.

Methods

We propose a model to predict alternative TSS usage. We have included a customized encoder module to properly incorporate RNA-Seq data.
We have three methods for incorporating RNA-Seq signal data into the model:
1) Concatenate signal as additional channel to Encoder module
2) Concatenate binned signal values to embedding output of Encoder
3) Separate RNA encoder

Results

We conducted a model ablation study, demonstrating that including RNA-Seq data improves model performance. RNA-Seq performance boost was dampened when activity and contact features were added into the model. More details are elucidated in the results table.

Conclusions

RNA-Seq data improves performance of the model
RNA-Seq is a cost-effective alternative to CAGE-Seq that can provide data relevant to prediction of multi-TSS usage. The proposed model outperforms the base EPInformer model on the task of multi-TSS usage prediction. The pre-trained Encoder module from EPInformer does not improve performance compared to training from scratch.
Adding ATAC-Seq or DNAse activity, as well as HiC data into the fusion layer significantly improves performance, though the task is different from the EPInformer paper. This makes sense, as general expression levels and alternative TSS usage are biologically correlated phenomena.

The reduction of RNA-Seq on model performance when activity and contact features are included implies coupling of chromatin state and transcriptional output.
Chromatin accessibility and 3D structure (HiC) encode a significant portion of the cell-type specific information found in the transcriptome, effectively determining the 'regulatory state' prior to transcription."

37. Comparison of oral and gut microbiome highlights role of oral bacteria in systemic inflammation in HIV

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Purpose

Chronic HIV-1 infection is associated with persistent systemic inflammation despite effective antiretroviral therapy. While gut microbiome contributions to inflammation are well characterized, the role of the oral microbiome remains unclear. We investigated whether oral and gut microbiome composition contributes to systemic inflammation in people with HIV.

Methods

This cross-sectional study analyzed archived samples from 198 participants (99 with HIV, 99 without) from the Los Angeles-based mSTUDY cohort. Paired blood, rectal swab, and saliva samples from initial visits (2014–2018) were used. Oral and gut microbiomes were profiled by 16S rRNA sequencing, and systemic inflammatory cytokines were measured using multiplex assays. Associations between microbiome composition and cytokines were assessed using PERMANOVA and integrative multivariate modeling. Functional relevance was evaluated using in vitro bacterial co-culture, epithelial barrier permeability assays, and anti-bacterial IgG measurements.

Participants with HIV showed distinct oral microbiome composition, including increased *Veillonella*, *Capnocytophaga*, and *Megasphaera* and decreased *Fusobacterium*. The oral microbiome explained a significant proportion of cytokine variation in HIV and contributed more strongly to systemic inflammation than the gut microbiome. Oral *Veillonella* and *Megasphaera* were specifically associated with inflammatory cytokine profiles. Anti-*Veillonella parvula* IgG titers did not differ by HIV status but correlated with microbial translocation markers (sCD14, LBP) among people with HIV. In-vitro experiments demonstrated that *V. parvula* increased oral epithelial permeability and induced monocyte activation, supporting a mechanism linking oral dysbiosis to systemic inflammation.

These findings suggest that the oral microbiome—particularly *Veillonella parvula*—may contribute to persistent inflammation in treated HIV through epithelial barrier disruption, microbial translocation, and immune activation. Targeting oral microbial communities may represent a potential strategy to reduce inflammation-related comorbidities in people with HIV.

Results/Conclusion

This study compared oral microbiomes in 198 men with and without HIV. Persons with HIV showed distinct oral bacterial patterns, including increased *Veillonella* and *Megasphaera*, which correlated with higher inflammatory cytokines such as IL-6. The oral microbiome significantly contributed to systemic inflammation and was linked to gut dysbiosis. *Veillonella parvula* increased epithelial permeability and triggered pro-inflammatory cytokine production and monocyte activation in vitro, suggesting oral bacteria may promote systemic inflammation in well-controlled HIV through microbial translocation and immune activation.

38. Comparing *In Vitro* Effects of Methotrexate and 5-Fluorouracil on Cutaneous Squamous Cell Carcinoma and Superficial Basal Cell Carcinoma Cell Lines

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Purpose

Methotrexate (MTX) and 5-fluorouracil (5-FU) are established antimetabolites used in dermatology for the treatment of cutaneous squamous cell carcinoma (cSCC) and superficial basal cell carcinoma (sBCC). Direct comparison of MTX and 5-FU across both cSCC and sBCC cell lines under the same conditions are limited. In this study we seek to compare the in-vitro effects of MTX versus 5-FU on cell viability and stress/apoptosis-associated responses in cSCC and sBCC cell lines. A direct comparison of MTX and 5-FU in cSCC and sBCC can guide drug selection and support more effective, lower-toxicity treatment strategies in cSCC and sBCC.

Methods

Human cSCC (cSCC-15) and sBCC (sBCC-1/KMC) cell lines will be exposed to graded concentrations of MTX and 5-FU. Dose–response curves will be generated and IC50 values estimated using an MTT assay. After treatment at IC50-based concentrations, cellular metabolism will be assessed using an MTTA assay and reactive oxygen species (ROS) generation measured using an H2DCFDA assay. Quantitative RT-PCR will be used to evaluate treatment-associated changes in selected proliferation, apoptosis, and stress-response gene transcripts. Outcomes will be compared within and between cell lines to determine whether MTX and 5-FU produce similar cellular effects across cSCC and sBCC models.

Hypothesis/Significance

We hypothesize that cSCC and sBCC cell lines will demonstrate comparable in-vitro responses to MTX and 5-FU. Results may help justify further translational work evaluating nonsurgical treatment strategies, particularly for patients who are poor surgical candidates or prefer alternatives to excision.

39. Optimization of Keratinocyte Cell Growth: KBM™ Gold Basal Media vs. DermaCult™ Keratinocyte Expansion Basal Medium

- Presenting Author: Josh Axtell (Roseman University)

Additional Author:

- Kyleen Castro (Regenicin, Inc.)

Purpose

The aim of this study is to determine the most effective media for expanding keratinocyte cells in the creation of autologous skin grafts. This study utilizes both fibroblast and keratinocyte basal media to support skin cell growth in vitro. There is sufficient research which demonstrates that keratinocytes grow at slower rates than fibroblasts.

Methods

Skin cells obtained from human subjects were dissociated into keratinocyte and fibroblast cells representing the epidermal and dermal layers of the donor skin. To improve reproducibility and efficacy, KBM™ Gold Basal Medium (Lonza, Walkersville, MD, USA) and DermaCult™ Keratinocyte Expansion Basal Medium (STEMCELL Technologies, Vancouver, BC, Canada) were compared through seeding and passaging of the cells. Following each generation through Passage three (P3), the total cell counts were compared and analyzed using a LUNABx7 Automated Cell Counter to determine the media that generated the highest yield of keratinocytes and fastest rate of growth.

Results

Preliminary cell count data suggests that DermaCult™ Keratinocyte Expansion Basal Medium exhibits higher yields of keratinocytes than the KBM™ Gold Basal Medium with significantly faster growth rates. Further data analysis is ongoing to confirm these results.

Conclusions

These preliminary results suggest that keratinocyte cell growth rates can be significantly improved with enhanced media such as DermaCult™ Keratinocyte Expansion Medium, with potential relevance towards autologous skin grafts.

40. Querying the Relationship between GRK2 and the KRAS Network in Pancreatic Cancer

- Presenting Author: Valerie Tran (Roseman University)

Additional Author:

- Yoo Ri Whang (Roseman University)
- Christopher So (Roseman University)

Purpose

Understanding the relationships between proteins involved in pancreatic cancer is critical for uncovering its mechanisms and developing more effective therapies.Despite advances in treatment, pancreatic cancer remains one of the deadliest forms of cancer.In this study, we investigated potential connections between proteins in KRAS-mediated signaling and G protein–coupled receptor kinase 2 (GRK2).

Methods

We used two key databases, STRING (https://string-db.org/) and the Human Protein Atlas (https://www.proteinatlas.org/) to guide our analysis. STRING was utilized to identify the top 100 proteins linked to KRAS. The Human Protein Atlas provided data on pancreatic cancer samples, including whether these proteins were upregulated or downregulated. We then assessed correlations between GRK2 expression and the expression of these 100 proteins.R^2 analysis was performed to identify the strongest correlations.The top correlations were further examined for potential age- or gender-specific trends.

Results

Most proteins analyzed showed weak correlations with GRK2 expression.Among the 100 KRAS-interacting proteins, expression patterns varied in relation to GRK2, with some showing stronger associations than others.The average R^2 value across all proteins was 0.05. The strongest correlation was observed with MAPK3, also known as ERK1, (R^2 = 0.3), which exceeded the correlation with KRAS itself (R^2 = 0.1048).Several of the top 10 correlated proteins were members of signaling pathways, including MAPK, PI3K, and G protein networks.

Conclusions

We examined relationships between GRK2 expression and proteins within the KRAS signaling network in pancreatic cancer. Although overall R^2 values were low, several MAP kinase family members and other signaling proteins showed stronger correlations with GRK2. These findings suggest that GRK2 may act as a potential mediator within MAPK and related signaling pathways in pancreatic cancer.

135. Comparative efficacy of zinc-finger nucleases versus CRISPR in paroxysmal nocturnal hemoglobinuria

- Presenting Author: Madelyn Nguyen (Faith Lutheran High School)

Additional Author:

- Athena Ricciardi (Faith Lutheran High School)
- Sarah Robinette (Faith Lutheran High School)
- Sriya Wint (Faith Lutheran High School)
- Stella Lee -Graduate Mentor (Roseman University)

Abstract

Paroxysmal nocturnal hemoglobinuria (PNH) is a rare blood disorder triggered by a random mutation in the phosphatidylinositol glycan class A (PIG-A) gene. The mutation results in defective blood stem cells (producing red blood cells, platelets, and white blood cells) that lack the necessary protective protein. This allows the immune system to then invade and attack. Since the disease is infrequent within patients, there is currently no mainstream cure for PNH. The current treatment options are bone marrow transplants, which lead to a permanent removal of the mutation without rendering the immune system inoperative. However, this procedure is high-risk. This research was to develop and propose more efficient treatments for PNH, while reducing unnecessary risks. The two hypothetical officiant treatments paired with self-inactivating (SIN) lentiviral vectors are zinc-finger nucleases (ZFNs) and CRISPR. Zinc-finger nucleases (ZFNs) are considered highly accurate and precise “scissors” for a genome, which act as restriction enzymes used to target and cut specific genes. ZFNs have been used to remove the PNH-causing mutation permanently. Similarly, CRISPR genomic editing allows for non-homologous end joining, mutation, and insertion. SIN lentiviral vectors work to safeguard the process by “turning off” the gene editing if it extends past the target gene (PIG-A). ZFNs provide great accuracy, while CRISPR is more cost effective and efficient for standard care. Both methods would be examined over a 45-day period to determine the most practical strategy for eradicating the PIG-A mutation. The results would be analyzed daily using FLAER-based flow cytometry to detect and record the amount of cells which contain the mutation. There would be an expected decline in the presence of PIG-A gene mutations in observed stem cells, indicating an improvement in the condition. Using the SIN lentiviral vectors to deliver ZFNs would offer exceptional specificity; however, CRISPR-Cas9 offers simplicity, improved efficacy, and reduced cost, suggesting that it would be a superior method. These methods should help to further understand potential treatments for PNH, as well as other disease states induced by PIG-A mutations.

136. Inhibition of the HLA-DQ2 heterodimeric protein via CRISPR-Cas9 to reduce inflammation in the intestinal lining of patients with celiac disease

- Presenting Author: Addilyn Alexandre (Faith Lutheran High School)

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- Peter Milohnic (Faith Lutheran High School)
- Jillian Sandquist (Faith Lutheran High School)
- Melika Cummings -Graduate Mentor (Roseman University)

Abstract

The purpose of this research was to propose a hypothetical randomized, double-blind, placebo-controlled study to examine the potential of CRISPR-Cas9 therapies to manage celiac disease. Celiac disease is an autoimmune disorder triggered by gluten consumption. The HLA-DQ2 heterodimeric protein binds to a gluten protein (gliadin) and presents the protein to T cells as foreign, triggering an inflammatory response primarily in the small intestine. Certain studies have shown success in using CRISPR-Cas9 in human gene editing, such as research in gastrointestinal cancer and inflammatory bowel disease, but with limitations, such as a lack of variability in preceding treatments and a lack of inflammatory reduction. The focus of this research was to examine the potential of CRISPR-Cas9 to introduce a gene that creates an inhibitor protein to bind to the heterodimeric protein produced by the HLA-DQ2 gene associated with celiac disease. CRISPR-Cas9 has been successfully used to edit the gliadin in wheat, but no current research in humans has been completed. Testing would be performed on patients with confirmed celiac disease (6+ months) who do not have other autoimmune disorders and are between 20-70 years of age. Patients would be required to be gluten-free for 6 months prior to testing to reduce gluten-related antibodies. The treatment group would be injected with a one-time dose using a nonreplicating adeno-associated virus vector, while the placebo group would receive saline. After 2 weeks, patients would be introduced to gluten. At weeks 6,12, and 18, antibody measurements would be taken to compare the treatment group to the placebo group, with the expectation of reduced inflammation in the small intestine after gluten ingestion and increasing quality of life for people with celiac disease.

137. Utilization of CRISPR-Cas9 gene editing via retrovirus to target CD8+ T cells for the suppression of multiple sclerosis (MS)

- Presenting Author: Aaron Bertone (Faith Lutheran High School)

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- Kobie Webb- Graduate Mentor (Roseman University)

Abstract

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system that alters the immune system's detection process, resulting in demyelinating the sheaths that surround neurons. Current therapies largely suppress immune function by blocking lymphocyte migration across the blood brain barrier or by depleting immune cells entirely. Cytotoxic T lymphocytes (CTLs), also known as CD8+ T cells, are vital for eliminating abnormal cells and disabling their functions broadly can compromise overall immune competence. The mechanisms by which CD8+ T cells begin targeting myelin remain unclear, limiting the development of safe targeted therapies. This research study evaluated emerging strategies that aim to selectively impair pathogenic CD8+ T cell activity while preserving overall immune function in multiple sclerosis. It also focused on a proposed mechanism to interrupt myelin sheath degradation via the induction of CD8+ T cell dysfunction. Using PRISMA guidelines, approximately 20 studies were examined for potential methods on CD8+ CRISPR gene editing and delivery via retrovirus, with 12 studies being referenced. Studies underwent extensive review using a refined PICO framework. Variable fragments of the T cell orthoclone monoclonal antibody OKT8 bound to a laboratory-created retrovirus were described as a method for targeting the CD8 alpha molecule. After attachment, the retrovirus would insert a twenty-nucleotide sgRNA sequence complementary to the CD8α gene. In combination with the CRISPR-Cas9 protein, this sgRNA mediates targeted gene cleavage, potentially weakening CD8+ T cell-mediated myelin degradation while maintaining partial immune function. The proposed approach presents notable limitations, including non-specific binding of OKT8 to CD8 alpha molecules on non-CD8+ T cells and the potential for off-target Cas9 activity. This method highlights the potential precision of CRISPR-based applications for selectively modulating pathogenic immune responses in multiple sclerosis. The findings suggest that CD8+ T cells are a critical and previously under-targeted contributor to MS pathology. CRISPR-modulated CD8+ T cell functions may allow for improved disease control while preserving immune competence, highlighting their potential in future autoimmune therapies.

Clinical Sciences

41. Systematic Review of Drug Delivery and Therapeutic Agents in Clinical Trials for the Treatment of Traumatic Brian Injuries

- Presenting Author: Stella Lee (Roseman University)

Additional Author:

Surajeet Dey (Roseman University)

Purpose

Drug Delivery in patients diagnosed with a traumatic brain injury (TBI) is altered due to physiological changes such as the disrupted blood-brain barrier (BBB), which is difficult to permeate. Ensuring efficacy standards are met is challenging because therapeutic agents used for the treatment of TBIs may have different effects. While improving efficacy, it is also vital to reduce the risk of side effects and complications that may arise.

When administering a drug to a TBI patient, advanced drug delivery methods are required such as convention-enhanced delivery (CED), nanoparticle delivery, and mitochondrial drug delivery. These advanced methods help to overcome the challenges systemic routes face, such as bypassing first pass metabolism, crossing the BBB, and entering straight into the brain tissue. After utilizing the advanced drug delivery methods and the drug has entered the brain tissue, then the drug can be observed to categorically distinguish the function and effectiveness for the treatment of TBIs.

Methods

Here we report on advanced drug delivery methods and provide a systematic review of the therapeutic agents used in clinical trials for the treatment of TBIs. The database that was used to obtain information was PubMed, and original research as well as reviews were utilized. We have created a table from original research studies that organize the therapeutic drugs and lists their characteristics.

Results

Some of the promising technologies and therapies include mitochondrial drug delivery, nanoparticles, stem cell and non-stem cell exosomes, cell penetrating peptides, and regulation of osmotic pumps. These therapies are essential to treatment because they account for the tedious nature of drug delivery in TBIs.

By changing the mode of drug delivery by modifications and engineering particles that are specifically designed to reach the target site, therapeutic agents can accurately reach the desired area and begin providing relief to brain injured patients.

Conclusions

TBIs are a difficult condition to treat and manage. With few long-term TBI studies available, it is challenging to understand the brevity of this condition and what the implications of treatment are. However, new technologies make it possible for individuals to regain functionality in their brain.

42. Timing of Sedation Initiation Post-Intubation in the Emergency Department

- Presenting Author: Mariam Alebyan (Roseman University)

Additional Author:

- Mickayla Clark (Roseman University)
- Thomas Clark (MountainView Hospital)
- Chris Williams (MountainView Hospital)
- Hayden Maag (MountainView Hospital)

Purpose

Awareness with paralysis is a concerning complication for patients who are mechanically ventilated. The timely initiation of sedation post-intubation is imperative to prevent patients from being alert when paralyzed. The purpose of this project is to assess sedation initiation times post-intubation in the emergency department (ED) at our institution with the goal of improving the time to initiation of sedation for patients intubated in the ED.

Methods

This study is a pre-post quality improvement evaluation of sedation practices following intubation in the ED. Patients were identified using the electronic health record (EHR) and clinical decision support software, with inclusion criteria being receipt of a sedating agent (propofol, fentanyl, dexmedetomidine, midazolam, or ketamine); post-intubation, and intubation confirmed via chart documentation. Baseline data were collected prior to the implementation of a quality improvement educational program delivered to pharmacists and nurses within the ED, which focused on best practices for sedation initiation following intubation. Post-intervention data were then collected and compared to the baseline to assess the effect of the education program. The primary outcome of the study was time to administration of maintenance sedation post-intubation.

Results

A total of 48 patients were evaluated in the pre-intervention group and 48 patients in the post-intervention group. The median time for sedation initiation post intubation decreased significantly from 28 minutes in the pre-intervention group (95% CI, 17.5 - 52.0; p = 0.0001) to 8.5 minutes post-intervention group (95% CI, 4.0 - 13.0; p = 0.0001).

Conclusions

The implementation of a quality improvement education for ED pharmacists and nurses was associated with a significant reduction in the time to initiation of sedation post-intubation. Median sedation initiation decreased from 28 minutes pre-intervention to 8.5

minutes post-intervention, highlighting the effectiveness of targeted education in improving patient safety and reducing the risk of awareness during paralysis. These findings support ongoing efforts to standardize sedation practices in the ED to enhance timely and safe patient care.

43. Gingival Hyperplasia In Orthodontic Patients

- Presenting Author: Mohamed Ali Basha (Roseman University)

Purpose

The purpose of this literature review is to discuss the most recent information regarding the etiology of gingival hyperplasia in orthodontic patients and treatment methods

Methods

When starting to gather information, it was important to ensure that we found studies that were appropriate for our topic. It was also important to make sure that previous studies had been done on this topic. In this section, we elaborate on our search strategy and selected studies. The following PICO was used: Population being patients with gingival hyperplasia, intervention being orthodontic treatment, no comparison, and outcome being malocclusion. A comprehensive literature review was done using the following electronic databases: Web of Science, PubMed, Cochrane, Medline. Keywords “Gingival Hyperplasia” AND “Orthodontic*”, “Gingival Hyperplasia” AND “Orthodontic Interventions”, AND “Gingival enlargement” were used to search for relevant articles from 2000-2024 in English only. The reference list obtained was reviewed by the principal investigator.

The studies selected for this research met the inclusion criteria of topics related to Gingival Hyperplasia and orthodontic interventions. The selection criteria required the articles to provide specific information about gingival hyperplasia, and Orthodontic treatment. Any studies that did not meet this selection criteria were excluded from the comprehensive review. In addition, non-peer reviewed and opinion-based articles were also not included in the research. Literature review matrix will be used to organize the writing. The columns will include the article, year, and highlights. EndNote will be used to manage relevant citations.

Results

Gingival hyperplasia is a multifactorial disease that occurs due to response to various stimuli as well as different host-environment interactions. This paper discusses the causes of gingival hyperplasia and current treatment and management methods for individuals suffering with gingival hyperplasia.

Gingival hypertrophy usually occurs 1 to 2 months after orthodontic treatment. Many factors can aggravate gingival inflammation and cause gingival fibrosis and hypertrophy, such as reduced plaque control, chemical and physical stimulation of adhesives, mechanical band stimulation and food impaction. Although plaque is often believed to be the leading cause of gingival inflammation and hypertrophy, it has been reported that gingival hypertrophy also occurs in patients with good oral hygiene, suggesting that orthodontic force and periodontal remodeling may also be associated with gingival hypertrophy.

For example, Surlin et al found that out of 22 fixed orthodontic patients, 15 developed gingival hypertrophy the level of matrix metalloproteinase (MMP)-8 in these patients was significantly higher than that in the standard orthodontic treatment group (no periodontal lesions in the latter group). A positive correlation was found between the degree of gingival hypertrophy and the expression of MMP-9/IV collagen in gingival tissue in orthodontic patients without inflammation. Based on these results, they believe that the increase in MMP level caused by orthodontic force may be one of the causes of gingival hypertrophy, but whether pure orthodontic power is a direct factor in gingival hypertrophy still needs to be explored further.
On the other hand, it was shown that a continuous low concentration of nickel ion stimulation in some orthodontic devices is an essential cause of gingival hypertrophy in orthodontic treatment, Nickel ions may stimulate the growth of epithelial cells 'and the proliferation of keratinocytes by inducing T-lymphocytes to produce interferon and interleukin (IL)-2, IL-5, and IL-10, which may lead to gingival hypertrophy. Nickel ion release may be a time-dependent type IV allergic reaction. Thus, it is necessary to know whether the patient has a history of nickel allergy to avoid the occurrence of gingival hypertrophy during orthodontic treatment.

Another factor that may be associated with the occurrence of GE is the hormonal changes that occur during puberty. Sexual maturation during puberty is related to increased levels of the steroid sex hormones. As a result, subclinical inflammatory changes may modulate periodontal tissues to be more sensitive to small amounts of plaque, and a hyperplastic reaction of the gingiva may occur. This influence of sex hormone levels may explain, at least in part, the greater likelihood of younger participants to have GE. Furthermore, older patients are more likely to have preventive attitudes and habits because of a greater interest in health than
younger ones.

It has been revealed by literature review that dental plaque formation contributes to the pathogenesis of gingivitis that eventually leads to gingival hyperplasia. Gingival hyperplasia depends on the balance between microbial biofilms, immune and inflammatory host responses. It’s a known fact that placing orthodontic appliances raises the amount of plaque accumulation that changes the subgingival ecosystem. All these changes push host cells to release several inflammatory cytokines that include interleukin 1β (IL-1β), interleukin 6 (IL -6) and interleukin 8, (IL-8) and several other growth factors like tumor growth factor (TGF). This results in an inflammatory response in periodontal tissues to such appliances.

It was shown in recent studies that there is an association between GE and the use of fixed orthodontic appliances was observed. An increasing occurrence of GE was observed as the length of orthodontic treatment increased. Even after the adjustment for important cofactors, patients using fixed orthodontic appliances for 1, 2, or 3 years had a 20 to 28-fold increased risk for GE. It was observed that the inclusion of behavioral and clinical variables in the adjusted model promoted a slight decrease in the magnitude of the association

between the duration of orthodontic treatment and the extent of GE, suggesting that a small portion of the effect of group on GE was mediated by some of these variables.

Conclusions

The aim of this paper was to provide a comprehensive review of current practices within orthodontics in relation to gingival hyperplasia. After going through numerous articles, it was found that periodontal risk factors should be assessed, and prognostic judgements should be made to predict possible risks and provide effective prevention in addition to effective chairside oral health instruction. Periodontal examination and maintenance should be performed regularly during orthodontic treatment, and periodontal problems should be addressed actively. There is still a need to increase patients' awareness of oral hygiene maintenance after treatment to ensure they maintain their periodontal health. Orthodontists should strengthen interdisciplinary cooperation with periodontal practitioners to achieve the best therapeutic effect. Further longitudinal studies may elucidate the association between the use of fixed orthodontic appliances and gingival hyperplasia and how to prevent more effectively.

44. Effects of Mouth Breathing in Children and Adolescents

- Presenting Author: Stephanie Lee (Roseman University)

Additional Author:

- Zainab Qazalbash (Roseman University)
- Joseph Cheever (Roseman University)

Purpose

The purpose of this literature review is to determine the effects of mouth breathing in children and in adolescents on the development of the dentofacial complex, discuss ways to diagnose mouth breathing, and possible treatment options.

Methods

Utilized five databases i.e. Dentistry and Oral Sciences Source, Scopus, Web of Science, PubMed and Academic Search Premier to identify relevant articles.
Inclusion criteria: Participants under 20 years old, both sexes, addressed prevalence, etiology, consequences, and/or treatments for mouth breathing, types of articles included clinical trials, peer reviewed articles in English
Exclusion criteria: Published prior to 2008, published in a language other than English, patients older than 20 years old, articles that consisted only abstracts without the full text, animal studies, participants with syndromes or disease
Terms: Mouth-breathing, oral breathing, nasal obstruction, airway obstruction, dentofacial growth, children, adolescents
The initial search across multiple databases yielded a total of 317 articles. Of these, 128 were duplicates. The titles and abstracts of these 189 articles were reviewed and 111 unrelated studies were excluded, and resulted in 78 articles being assessed for eligibility through full-text review. Upon further evaluation, 65 articles were excluded; 8 did not have full text available, 3 articles had participants with syndromes or disease, 10 included participants older than 20 years old, and 44 were not focused on the specific intersection of mouth breathing and its effects on the facial complex. Consequently, 12 studies met all the inclusion criteria and were selected for the final review. One article was included based on recent trends regarding mouth taping with participants outside the original age range to discuss options or possible alternative treatment modalities due to limited studies available.

Results

Causes
Obstructive Factors: The most common cause is upper airway obstruction. Upper airway obstruction can occur at any site:
Nasal cavity
Inflammation - Allergic rhinitis (Possibly most common cause of mouth breathing), chronic rhinitis, sinusitis.
Morphological deformities - Deviated nasal septum, turbinate hypertrophy, nasal polyps,

nasal trauma.
Nasopharynx
Adenoid hypertrophy
Adenoids actively growing between 2-6 years old and decrease after 10.
Pathologically hypertrophic adenoids and tonsils do not atrophy normally and will reduce pharyngeal cross sectional area.
Oropharynx
Tonsilar hypertrophy
Tonsils actively growing between 2-5 years old and gradually disappear around 14-15 in most people.
Laryngopharynx
Habitual Factors: A child may continue to breathe through the mouth out of habit, even after an obstruction has been cleared (functional mouth breathers).
Anatomical Factors: Short upper lip or lip incompetence prevents the lip from closing naturally.

Consequences
Dentofacial and Craniofacial Development
Malocclusions: Mouth-breathing children are more likely to develop malocclusions than nasal-breathing children. The altered tongue posture—low and forward instead of resting against the palate—leads to a constricted or V-shaped upper dental arch. Common malocclusions include:
Posterior crossbite.
Anterior open bite.
Increased overjet.
Class II malocclusion, characterized by a retrognathic mandible, is frequently observed.
Class III malocclusion with mandibular protrusion can occur, particularly when tonsillar hypertrophy forces the mandible forward to open the airway.
Skeletal Changes: Chronic mouth breathing is associated with a characteristic facial appearance often called "adenoid facies" or "long face syndrome. These skeletal changes include:
Downward and backward rotation of the mandible.
Increased lower anterior facial height and a steeper mandibular plane angle.
A high-arched or "gothic" palate.
A narrow maxilla.

Postural and Muscular Changes
Mouth breathers often adopt a forward head posture to facilitate airflow. This leads to an imbalance in muscular and postural strength, which can affect respiratory biomechanics and reduce exercise capacity.

Other Health Consequences

Oral Health: Mouth breathing leads to a dry mouth from saliva evaporation, which reduces its protective effects. This increases the risk for dental caries, gingivitis (especially in the upper front teeth), and other periodontal diseases. Mouth breathers have been found to have higher levels of Streptococcus mutans and plaque.
Sleep Disorders: Mouth breathing is a symptom of sleep-disordered breathing (SDB). Children may experience snoring, agitated sleep, and obstructive sleep apnea (OSA). These sleep disturbances can lead to daytime sleepiness, irritability, and poor school performance.

Treatment
Treatment for mouth breathing is multidisciplinary and depends on the underlying cause and/or the location of obstruction (i.e. nasal cavity, nasopharynx, oropharynx, laryngopharynx).
Obstruction: If an obstruction is present, medical/surgical intervention is often the first step.
Adenotonsillectomy: Surgical removal of enlarged adenoids and tonsils.
Allergy Management: Treatment of allergic rhinitis with medication.
Rapid Maxillary Expansion (RME): RME widens the maxilla but also increases the volume of the nasal cavity. However, its effect on alleviating the habit of mouth breathing itself requires more research, and its impact on the nasopharyngeal and oropharyngeal volumes is not consistently significant. Some research suggests RME is not justified on its own to induce a nasal breathing pattern.

Habit / Functional Mouth Breathing
Oral Myofunctional Therapy (OMT): After any obstruction is removed, OMT can help re-educate the orofacial muscles and re-establish a nasal breathing pattern. This involves exercises to strengthen the lips, tongue, and cheeks, and to correct swallowing patterns.
Physical Therapy: Can address the postural changes associated with mouth breathing, such as forward head posture.
Mouth-Taping: This practice involves placing tape over the mouth, especially during sleep, to encourage nasal breathing.
Social Media Claims: Many claims about mouth-taping on social media, such as improved immunity, skin, and digestion, are not supported by research. The only claims with some scientific evidence are related to improving sleep apnea and snoring, though the evidence is sparse.
Efficacy in mouth breathers with OSA: A study on patients with mild Obstructive Sleep Apnea (OSA) found that mouth-taping significantly reduced the apnea-hypopnea index (AHI) and snoring index (SI). The improvement was greater in those with higher baseline AHI and SI. Another study found that mouth-taping combined with a mandibular advancement device (MAD) was more effective in reducing AHI than the MAD alone. However, mouth-taping alone did not show a significant AHI reduction in that particular study. In patients with asthma, mouth-taping showed no benefit.
For Habit Elimination: In functional mouth breathers that are able to breathe through their nose and have no obstructive etiological factor, the lip seal test can be performed at home

daily. The parent is instructed to seal the child's mouth with masking tape at home when the child is distracted or focusing his/her attention on another activity, then progressively increase the time each day until the child is able to breathe only through the nose for at least two consecutive hours.

Conclusions

By recognizing the clinical signs of mouth breathing, dentists can educate patients and parents on its consequences and facilitate timely referrals for comprehensive diagnosis and treatment. While established treatments like adenotonsillectomy and allergy management address causative factors, therapies such as rapid maxillary expansion, myofunctional therapy, and mouth taping show promise but require more robust, high-quality research to validate their efficacy. Future studies should prioritize establishing standardized diagnostic criteria and conducting longitudinal trials to better understand the long-term outcomes of various treatment modalities, ultimately ensuring that children affected by this condition receive the timely and effective care necessary for healthy growth and development.

45. Where You Place, How You Load: A Scoping Review of the Determinants of Orthodontic Mini-Implant Success

- Presenting Author: Ambrose Ha (Roseman University)

Additional Author:

- Jacob Gardner (Roseman University)
- Samantha Lee (Roseman University)
- Amir Mohajeri (Roseman University)
- Man Hung (Roseman University)

Purpose

This scoping review identifies and analyzes factors influencing the effectiveness of orthodontic mini-implants and temporary anchorage devices in orthodontic treatments, including clinical applications, success rates, and associated complications

Methods

Methods: A systematic search was conducted across EBSCOhost, Ovid Medline, PubMed, Scopus, and Web of Science for peer-reviewed, English-language human studies published between 2013 and 2023 that examined determinants of mini-implants/temporary anchorage devices success or failure. Inclusion/exclusion criteria were predefined, and screening was performed in duplicate.

Results

Results: Placement site and peri-implant oral hygiene/soft-tissue health were the most consistent contributors to success. Optimal sites varied by indication, supporting individualized planning. Greater implant length generally improved stability but must be balanced against anatomic limits and patient comfort. Temporary anchorage devices supported diverse movements (e.g., molar distalization; posterior/anterior intrusion). Findings for loading protocol, patient age, bone quality, and operator experience were mixed, reflecting heterogeneity in primary stability, force magnitude/vector, and outcome definitions.

Conclusions

Conclusion: Mini-implants/temporary anchorage devices success is multifactorial. Emphasis on site-specific selection, hygiene management, appropriate implant dimensions, and patient-specific modifiers can optimize outcomes and minimize complications. Future studies should report standardized outcomes and explicit loading parameters to enable granular analyses of movement-specific biomechanics and evidence-based decision-making.

46. Analysis of Overall Orthodontic Treatment Time When Using LightForce: A Literature Review

- Presenting Author: Lauren Tomlinson (Roseman University)

Purpose

The length of orthodontic treatment is one of the major factors in determining the success of a patient's final outcome. For most patients, any treatment time longer than anticipated in full fixed appliances can negatively impact oral health. As treatment time increases, compliance and motivation tend to decrease. Improper brushing and flossing techniques greatly increase the risk of poor oral hygiene, ultimately leading to gingivitis, periodontal disease, and decay. The objective of this literature review is to investigate if LightForce is an effective and efficient treatment option that does in fact reduce overall treatment time. Finishing treatment in a timely fashion would be beneficial for not only the patient's oral health, but their overall well-being.

Methods

A literature search was conducted utilizing the following databases: PubMed, Scopus, and Google Scholar. The search included the following key words: "LightForce Orthodontics," "3D printed customized brackets," and "LightForce Treatment Time." Peer-reviewed articles containing information on the efficiency and effectiveness of the LightForce bracket system along with duration of total treatment time were considered eligible for review. Search results are currently being studied, analyzed, and summarized accordingly.

Results

TBD

Conclusions

TBD

47. Periprocedural Anaphylactoid Reaction to Neostigmine-Glycopyrrolate: A Case Report

- Presenting Author: Dakota Muth (Touro University)

Additional Author:

- Anthony Zhou (Attending Physician)

Purpose

We report a case of a suspected anaphylactoid reaction following administration of neostigmine–glycopyrrolate for neuromuscular blockade reversal, emphasizing the importance of early recognition and prompt treatment.

Results

Perioperative anaphylactoid reactions are rare but potentially life-threatening emergencies characterized by acute hemodynamic instability and respiratory compromise. Common causative agents include antibiotics, neuromuscular blocking agents, and antiseptics such as chlorhexidine, particularly when administered intravenously. Reversal agents for neuromuscular blockade are less frequently implicated. Diagnosis may be challenging under general anesthesia due to surgical draping, the patient's inability to report symptoms, and overlapping anesthetic effects. Management of perioperative anaphylaxis includes immediate discontinuation of the suspected trigger, reduction of anesthetic depth, aggressive fluid resuscitation, and prompt administration of epinephrine.

Conclusions

Increased awareness of neostigmine as a potential trigger may facilitate earlier diagnosis and treatment.

48. Impact of AUC/MIC-Based versus Trough-Based Vancomycin Monitoring on Acute Kidney Injury and Therapeutic Attainment in Hospitalized Adults

- Presenting Author: Saifeldin Mohamed (Roseman University)

Additional Author:

- Alana Whittaker (Roseman University)

Purpose

Vancomycin monitoring strategies have shifted following the 2020 IDSA guidelines, which recommend AUC/MIC-based monitoring (target 400–600 mg·h/L) over traditional trough-based monitoring (target 15–20 mg/L for serious infections). While AUC/MIC monitoring has been associated with reduced nephrotoxicity, its implementation poses challenges, including increased workload for pharmacists, nursing burden for multiple blood draws, vancomycin level draw errors and potential risks of over- or underdosing. Large randomized controlled trials comparing AUC/MIC- versus trough-guided monitoring are lacking, particularly outside of invasive MRSA infections. This study aims to compare the safety and efficacy of AUC/MIC- versus trough-based dosing in hospitalized adult patients receiving vancomycin.

Methods

This retrospective, pre–post intervention study will be conducted using Cerner Powerchart and Discern Analytics Reporting to compare outcomes of vancomycin monitoring strategies before and after adoption of AUC/MIC-based dosing at Valley Hospital Medical Center. The pre-intervention cohort will include patients who received trough-based monitoring between January 2018 and December 2019, while the post-intervention cohort will include patients who received AUC/MIC-based monitoring between January 2022 and December 2023. Eligible patients will be adults (≥18 years) who received IV vancomycin for at ≥48 hours with appropriate drug level monitoring (≥1 trough for the trough cohort, ≥1 trough and 1 peak for the AUC/MIC cohort). Exclusion criteria include end-stage renal disease or dialysis, pregnancy, and perioperative prophylaxis with vancomycin.

The primary outcome will be the incidence of acute kidney injury (AKI), defined as an increase in serum creatinine (SCr) by ≥0.3 mg/dL within 48 hours or ≥1.5× baseline within 7 days. Secondary outcomes include need for renal replacement therapy, vancomycin duration, in-hospital mortality, total number of vancomycin lab draws, and total number of appropriately timed vancomycin lab draws, and attainment of therapeutic exposure by day 3. Baseline data collected will include age, sex, weight/BMI, comorbid CKD, infection type, concomitant nephrotoxic exposures (aminoglycosides, loop diuretics, piperacillin-tazobactam, IV contrast, vasopressors), vancomycin duration, total cumulative dose, number of appropriately timed levels, and baseline SCr.

49. Comparison of Longitudinal Outcomes of Graft Augmentation in Rotator Cuff Repair: A Systematic Review and Meta-Analysis

- Presenting Author: Hunter Hitchens (Touro University)

Additional Author:

- Saliha Ahmad (Touro University)
- William Fang (Valley Hospital Medical Center)
- Kevin Mo (Valley Hospital Medical Center)
- Randa Bascharon (Valley Hospital Medical Center)
- Richard Winder (Valley Hospital Medical Center)
- Thomas Vangsness Jr. (University of Southern California)

Purpose

The objective of this systematic review is to evaluate the outcomes of full thickness rotator cuff tear primary repairs with and without patch augmentation, and to evaluate clinical outcomes over time.

Methods

A literature search was performed on PubMed and Embase databases through July 2025 in accordance with PRISMA guidelines. Eligible studies included comparative clinical trials and cohort studies reporting the outcomes of RCR with and without patch augmentation, specifying the type of graft used. Primary outcomes analyzed included patient reported outcomes such as ASES, Constant-Murley, or UCLA scores reported at 6 months, 12 months, or longer. Studies were included if they reported at least one of these outcomes, with a minimum follow-up of one year. The initial search resulted in 1808 titles, and 98 full-text articles were assessed for eligibility. A total of 11 studies met the inclusion criteria and were included for quantitative analysis.

Results

Constant scores were the only outcome reported across all three postoperative time points. No significant differences were observed at 6 months ($p = 0.1705$) and 12 months ($p = 0.0917$) when compared to controls. In contrast, Constant scores demonstrated a statistically significant improvement at a mean follow-up of 24 months or longer ($p = 0.0003$). ASES and UCLA scores were also reported at the 12 month and ≥24 months points, however, neither outcome was found to be significantly improved when compared to traditional RCR.

Conclusions

Patch augmentation in RCR appears to improve certain clinical outcomes, particularly Constant scores when compared to RCR alone. However, these improvements are noted only at longer-term follow-up, suggesting that the clinical benefits of augmentation may depend on biologic healing and maturation of the repair. These findings suggest that while functional outcomes may not improve quickly after surgery, benefits may be seen long-

term. Further high-quality, randomized Level 1 studies are needed to determine material-specific outcomes and guide optimal graft selection in clinical practice.

50. The improvement of masticatory efficiency after Class III orthognathic surgery- A scoping review

- Presenting Author: denise ng (Roseman University)

Additional Author:

- Mason Mullaney (Roseman University)
- Konstantinia Almpani (Roseman University)

Purpose

The objective of this study was to review the current evidence regarding the effect of surgery on the masticatory performance of Class III patients

Methods

Protocol

The protocol was developed using the methodological framework for scoping reviews proposed by the Joanna Briggs Institute (https://jbi.global/scoping-review-network/resources). The scoping review was reported following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) extension for scoping reviews checklist

Results

Masticatory efficiency was assessed in 8/44 studies with positive results in all cases (8/8, 100%), starting from six months postoperatively in two studies (25%)20,30, one study 47 reporting positive results at the one-year timepoint (12.5%) and three studies at the two-year timepoint (37.5%). The range of motion (ROM) of the mandible was examined in seven studies, with only one study33 reporting negative results (1/7, 14.2%) with the latest timepoint at six months. In terms of the timing of the evaluation in general, many of these studies did not report the specific timepoints of their post-operative assessments. For those who did, one study reported an improvement in ROM immediately after surgery, two studies between 6-9 months, and one study more than five years postoperatively.

Conclusions

Masticatory performance gradually improves after OS of Class III skeletal cases and can reach preoperative levels as early as three months after surgery. However, OS subjects do not always achieve the masticatory efficiency levels of orthognathic subjects earlier than three years postoperatively. Longer follow-up periods and standardized multimodality protocols for a more comprehensive assessment of masticatory function are recommended to facilitate future clinical research and improve clinical practice.

51. Invisalign Effects of Gingival Health

- Presenting Author: Rea Ghodasra (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

This literature review, titled "Invisalign and Gingival Health: A Comprehensive Literature Review," explores the relationship between clear aligner therapy and periodontal outcomes, emphasizing how Invisalign impacts gingival health compared to traditional fixed orthodontic appliances. The discussion integrates findings from clinical trials, longitudinal studies, and microbiological analyses, revealing that Invisalign tends to promote better gingival health through improved plaque control, reduced inflammatory response, and enhanced patient hygiene compliance.

Methods

For this literature review, a systematic search was performed using databases such as PubMed, MEDLINE, and Google Scholar to identify studies related to Invisalign and gingival health.
Keywords including "Invisalign," "clear aligners," "gingival inflammation," "periodontal health,"
and "orthodontic treatment" were used to retrieve relevant articles. The inclusion criteria were peer-reviewed articles focusing on the effects of Invisalign on gingival or periodontal health.

Results

In summary, this systematic review highlights the pivotal role of orthodontic treatment design—particularly appliance type—in influencing gingival and periodontal health during orthodontic therapy. Across multiple clinical, microbiological, and systematic investigations, clear aligner systems such as Invisalign consistently demonstrated superior outcomes in maintaining gingival integrity, reducing plaque accumulation, and stabilizing the oral microbiome when compared to traditional fixed appliances. These findings emphasize that aligner therapy not only facilitates improved hygiene and patient comfort but also offers distinct biological advantages for periodontal preservation throughout active tooth movement.

Conclusions

The reviewed literature collectively reinforces the importance of individualized orthodontic planning that accounts for soft tissue phenotype, oral hygiene capability, and long-term periodontal stability. While short- and mid-term results are favorable for aligners, the evidence base remains heterogeneous regarding long-term attachment levels and post-treatment gingival health. Future research should therefore focus on extended longitudinal evaluations, standardized periodontal assessment criteria, and the exploration of adjunctive preventive strategies to optimize gingival outcomes across all orthodontic modalities.

52. An Exploration of Contemporary Issues on Apical Root Resorption Following En-Masse Retraction of Anterior Teeth During Orthodontic Treatment

- Presenting Author: Andrea Carrizales (Roseman University)

Additional Author:

- Val Cheever (Roseman University)

Purpose

This exploratory research aims to provide a clear view of the most contemporary findings on post-orthodontic treatment root resorption on anterior teeth, specifically following en-masse retraction mechanics. It considers novel pairings of en-masse retraction mechanics with adjunct interventions, as well as resorption on mandibular anterior teeth, comparisons of bodily movement vs tipping, and resorption on teeth adjacent to impacted canines.

Methods

Searched PUBMED and Roseman Databases on November 18, 2025, limiting search results to the last 5 years. Six articles were selected from search results and compiled into literature matrix. Then created heat map chart based on articles' root resorption findings, following Malmgren's classification for root resorption.

Results

Studies show mild to moderate root resorption on anterior teeth following en-masse retraction mechanics. Studies that used 3D imaging show increased root resorption in comparison to 2D imaging studies. Interventions such as low-intensity electrical stimulation and micro-osteoperforations did not significantly increase root resorption; however, interseptal bone reduction did.

Conclusions

The imaging modality chosen in root resorption studies may impact the results reported, with 2D imaging resorption values being lower than 3D imaging. This may be a limitation of the imaging technology itself.

Some adjunct interventions are safe to combine with en-masse retraction without increased concern for root resorption, while others - namely interseptal bone reduction - may result in increased root resorption.

53. Integrating Multi-Omics Biomarkers, Artificial Intelligence, and Drug Repurposing to Advance Precision Medicine in Epithelial Ovarian Cancer: A Systematic Review and Translational Framework

- Presenting Author: Melika Cummings (Roseman University)

Additional Author:

- Fidelis Nwachukwu (Roseman University)

Purpose

Epithelial ovarian cancer (EOC) is a leading cause of gynecologic cancer mortality, driven by late-stage diagnosis, high recurrence rates, and limited effectiveness of uniform treatment strategies. While advances in molecular and multi-omics profiling have identified numerous biomarkers and therapeutic targets, these discoveries have not been systematically integrated into population-level screening or treatment pathways. As a result, opportunities to improve outcomes through precision health approaches remain underutilized.

Methods

A PRISMA-guided systematic review was conducted to evaluate molecular biomarkers, drug repurposing strategies, and computational approaches with relevance to population precision health in EOC. Extracted data included EOC subtype, biomarker performance for diagnosis or prognosis, therapeutic targets, and clinical outcomes. Evidence was synthesized using thematic analysis and a translational maturity framework to assess scalability, clinical readiness, and public health relevance.

Results

A total of 137 studies met inclusion criteria. Genetic biomarkers, particularly BRCA1/2 mutations and homologous recombination deficiency, demonstrated strong utility for population risk stratification. Protein biomarkers such as CA125 and HE4 remain widely used for monitoring but show limited effectiveness as stand-alone screening tools. Emerging AI-assisted models improved prognostic accuracy and recurrence prediction, supporting their potential role in population-level risk modeling. Several repurposed and immunotherapeutic agents demonstrated promise when aligned with molecular subtypes.

Conclusions

Integrating biomarker discovery, computational modeling, and drug repurposing into scalable precision health frameworks offers a pathway to improve early detection, risk stratification, and personalized treatment in EOC. Addressing implementation barriers is critical for translating molecular advances into population-level benefit.

54. Midodrine Use for Vasopressor Weaning in Patients Admitted to the Intensive Care Unit

- Presenting Author: Lillian Fleisher (Roseman University)

Additional Author:

- Kaylee Putney (Roseman University)

Purpose

Midodrine, an α-1 agonist that increases vascular tone, has a mechanistic rationale for vasopressor weaning; however, evidence is conflicting. The purpose of this study is to determine whether midodrine administration improved hemodynamic stability in patients admitted to the intensive care unit (ICU) by assessing changes in mean arterial pressure (MAP) and vasopressor requirements before and after midodrine initiation. By clarifying midodrine's role in hemodynamic stabilization, this study aims to determine its impact on patient outcomes and its appropriateness for the indication of vasopressor weaning in the ICU.

Methods

This retrospective chart review will be conducted using Cerner Powerchart and Discern Analytics Reporting at Valley Hospital Medical Center. Adult patients admitted to the ICU between October 1st, 2020, and October 31st, 2025, who required ≥ 1 vasopressor (minimum of 2 μg/min norepinephrine equivalent), were unable to be liberated from the vasopressor for > 24 hours, and received ≥ 5 mg doses of midodrine will be included. Exclusion criteria include death within 48 hours of ICU admission, prior midodrine therapy before ICU admission, midodrine used as needed for hemodialysis, or a history of liver cirrhosis. Data collected will include demographics, shock type, hemodynamic parameters, vasopressor dose (in norepinephrine equivalents), midodrine total daily dose at initiation and max dose received, ICU length of stay, and incidence of vasopressor restart. Safety endpoints will assess midodrine discontinuation at downgrade or discharge, as well as adverse events such as bradycardia.

Results

In progress.

Conclusions

Preliminary results from this project are anticipated to clarify whether midodrine meaningfully increases mean arterial pressure (MAP) and reduces vasopressor requirements in critically ill patients. Should midodrine demonstrate benefit, these findings would support its use as an adjunctive therapy for vasopressor weaning, potentially reducing ICU length of stay, vasopressor exposure, and associated complications. Conversely, if no improvement is observed, the results would caution against unnecessary prescribing, thereby minimizing costs and adverse events such as bradycardia. This study

will contribute to and further clarify the ongoing debate of midodrine dosing strategies, timing of initiation, and patient selection criteria in vasopressor weaning.

55. An Exploration of Literature on the Effect of Hydroxyapatite Toothpaste for Tooth Hypersensitivity

- Presenting Author: Eteete Dan Udoka (Roseman University)

Purpose

The objective of this project is to evaluate the effect of hydroxyapatite toothpaste for patients experiencing dentin hypersensitivity.

Methods

A structured literature review was conducted across major databases, including PubMed, Scopus, Web of Science, and Cochrane Library, to analyze human clinical studies published between 2015 and 2025. The review focused on U.S. based research investigating HAP as a primary intervention for DH, utilizing outcome measures such as the Visual Analog Scale (VAS) and Schiff score.

Results

The collective results from these studies highlight nano-hydroxyapatite (n-HAP) as a highly effective, biomimetic intervention for dentin hypersensitivity (DH) and enamel repair. These studies consistently demonstrates that n-HAP toothpastes achieve superior or equal results compared to traditional agents like fluoride, amine fluoride, and arginine. Specifically, n-HAP formulations showed the highest probability of being the most effective treatment within a 2-to-4-week window, with some concentrations like 15% n-HAP reaching dentinal tubule occlusion rates as high as 98.1%. n-HAP does not only mask the pain, n-HAP facilitates the physical restoration of demineralized enamel and provides complete tubule occlusion that is notably resistant to acid challenges which could come as a result of diet or lifestyle.

Conclusions

Nano-hydroxyapatite (n-HAP) serves as a high standard biomimetic agent that consistently matches or in some cases outperforms traditional fluoride and arginine treatments by providing rapid, acid-resistant relief through superior dentinal tubule occlusion. While it can offer additional aesthetic benefits like tooth whitening and smoothing, clinicians should be aware that its high sealing efficacy may potentially reduce resin-dentin bond strength during subsequent restorative procedures.

56. Understanding Fall Risk of Older Cancer Survivors using Longitudinal Data

- Presenting Author: Noel Karikulam (Touro University)

Additional Author:

- Adam Moussa (Touro University)
- Amy Peng (Touro University)
- Kristina Tang (Touro University)
- Harshita Sarambale (Touro University)
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Purpose

Falls are a major public health concern among older adults, contributing to injury, disability, and substantial healthcare costs. Older cancer survivors appear particularly vulnerable due to functional impairments, such as sarcopenia, neuropathy, cognitive changes, and fatigue. However, research examining fall risk among community-dwelling older cancer survivors is limited. This study examines whether older cancer survivors have a higher fall risk compared to those without a history of cancer, independent of age, mobility status, and frailty indicators.

Methods

Data from 8,597 Medicare beneficiaries aged ≥ 65 years in the National Health and Aging Trends Study (NHATS) Round 13 (2023-2024) were analyzed to determine bivariate associations between cancer status and fall outcomes, fear of falling (FOF), fear of falling avoidance behaviors (FFAB), and mobility device use. Survey-adjusted logistic regression models analyzed any associations between cancers and falls, adjusting for age, gender, race, and mobility device use.

Results

The weighted sample contains approximately 2.8 million individuals. Cancer survivors comprised 14% of participants. Bivariate analyses indicated higher rates of any fall (36.5% vs. 33.1%, $p = 0.015$), multiple falls (18.2% vs. 14.9%, $p = 0.0007$), FOF (36.5% vs. 30.4%, $p < 0.001$), FFAB (14.3% vs. 11.5%, $p = 0.010$), and mobility device use (28.5% vs. 24.2%, $p = 0.001$) among cancer survivors. Adjusted models showed that cancer was associated with increased odds of any fall (OR = 1.19, 95% CI 1.03-1.37), but this association was not statistically significant after accounting for mobility device use (OR = 1.13, 95% CI 0.98-1.31). Device use independently increased fall risk (OR = 3.08, 95% CI 2.74-3.45).

Conclusions

In the NHATS sample, older cancer survivors experienced increased falls and associated functional concerns compared to participants without a cancer diagnosis. Although cancer history contributes to fall risk, mobility impairment is the major mediator of this association. These findings highlight the importance of assessing mobility limitations and targeting interventions to reduce fall risk in geriatric cancer patients.

57. The Radiologic Presentation of Congenital Nephrogenic Diabetes Insipidus: Investigating the Posterior Pituitary Bright Spot

- Presenting Author: Jason Khoury (Roseman University)

Additional Author:

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Purpose

The posterior pituitary bright spot seen on T1-weighted MRI is a reflection of stored arginine vasopressin granules. While the absence of this bright spot is a well-established finding in central diabetes insipidus, the radiologic presentation of Congenital Nephrogenic Diabetes Insipidus (CNDI) remains under-characterized. Preliminary literature reviews indicate a lack of published data correlating CNDI with posterior pituitary bright spot findings. The purpose of this study is to determine the prevalence of the posterior pituitary bright spot in patients with confirmed CNDI. By establishing this correlation, we aim to assess the clinical utility of MRI in ruling out alternative pathologies in atypical CNDI cases and to deepen our understanding of neurohypophyseal negative feedback regulation in the setting of renal arginine vasopressin resistance.

Methods

We will conduct a retrospective chart review of patients with CNDI confirmed via water-deprivation or genetic testing. Electronic medical records will be queried to identify subjects who have undergone T1-weighted MRI of the brain or pituitary. De-identified imaging studies will be reviewed by blinded neuroradiologists to ascertain the presence or absence of the posterior pituitary hyperintensity. Descriptive statistics will be used to characterize the frequency of PPBS preservation in this population.

Results

Research not yet conducted

Conclusions

Research not yet conducted

58. Microabrasion for post orthodontic discoloration

- Presenting Author: Jacob Schvaneveldt (Roseman University)

Additional Author:

- Caden Probert (Roseman University)

Purpose

Post-orthodontic white spot lesions (WSLs) and other forms of enamel discoloration are a common aesthetic concern for patients following fixed orthodontic treatment. These lesions result from demineralization due to plaque accumulation around brackets and wires, areas that are difficult to clean adequately. The presence of WSLs detracts from the visual impact of the orthodontic result, often prompting patients to seek additional cosmetic treatment. Enamel microabrasion, a conservative and minimally invasive procedure, has gained attention as an effective treatment for managing post-orthodontic discolorations. This literature review synthesizes findings on the effectiveness, underlying mechanisms, procedural protocols, complementary treatments, and limitations of microabrasion for addressing enamel discolorations after orthodontic treatment.

Methods

To conduct a comprehensive review on the effectiveness of enamel microabrasion for post-orthodontic discoloration, we implemented a structured approach for article selection, focusing on studies that specifically evaluate microabrasion as a treatment for white spot lesions (WSLs) and enamel discoloration in post-orthodontic patients.

Results

The reviewed literature highlights enamel microabrasion as a highly effective and minimally invasive treatment for post-orthodontic white spot lesions (WSLs) and enamel discolorations. Studies consistently report significant reductions in lesion size, with Murphy et al. (2007) documenting an average 83% reduction, while others, such as Jahanbin et al. (2015), emphasize improvements in enamel smoothness and aesthetics. The polished finish achieved through microabrasion reduces plaque accumulation and provides durable results, particularly when reinforced with fluoride applications, as noted by Sundfeld et al. (2007) and Salmerón-Valdés et al. (2016). Compared to alternatives like bleaching, microabrasion offers a permanent solution for superficial discolorations with minimal enamel loss, typically between 25 and 200 microns. Combining microabrasion with treatments like bleaching further enhances outcomes, particularly for deeper discolorations. These findings establish microabrasion as a preferred, conservative approach in aesthetic dentistry.

Conclusions

Enamel microabrasion is an effective, minimally invasive approach for treating post-orthodontic WSLs and similar enamel discolorations. By removing the discolored enamel layer and creating a polished surface resistant to plaque, microabrasion offers both aesthetic and functional improvements. The technique is conservative, preserving tooth

structure and avoiding the need for more invasive cosmetic procedures. When combined with post-procedure fluoride treatments and, if necessary, dental bleaching, microabrasion provides comprehensive improvement in tooth appearance that aligns with patient expectations for a bright, uniform smile post-orthodontic treatment.

59. The Underlying Neuroanatomy and Clinical Characteristics of Altered Prioritization in Individuals with Dementia

- Presenting Author: Apurva Pendse (Roseman University)

Additional Author:

- Hulya Ulugut (University of California - San Francisco)
- Katherine Rankin (University of California - San Francisco)

Purpose

Altered prioritization (AP) is a clinical phenomenon marked by rigid behavioral patterns and heightened fixation on specific interests, frequently observed in patients with frontotemporal dementia (FTD), particularly those with right anterior temporal lobe (RATL) atrophy. Despite its prevalence, the neural mechanisms underlying AP remain poorly understood.

Methods

This study combined a transdiagnostic systematic review with clinical data analysis to investigate the neuroanatomical and cognitive-behavioral underpinnings of AP. Drawing on 107 neuroimaging studies across obsessive-compulsive disorder (OCD), autism spectrum disorder (ASD), schizophrenia, eating disorders, and dementia, we identified converging disruptions in frontotemporal, limbic, and cortico-striatal circuits.

Results

The findings highlighted hyperactivity and dysconnectivity within regions such as the orbitofrontal cortex, anterior cingulate cortex, insula, amygdala, and dorsal striatum. Clinical analysis of 1,499 participants from the UCSF Memory and Aging Center revealed that AP symptoms are most pronounced in semantic behavioral variant FTD (sbvFTD) patients early in the disease course but tend to stabilize over the course of the disease, whereas individuals with behavioral variant FTD(bvFTD) progressively develop more severe symptoms as the disease advances.

Conclusions

These patterns suggest that AP in dementia is closely linked to right temporal lobe dysfunction. By integrating findings across diagnostic boundaries, this study lays the groundwork for a transdiagnostic framework for understanding AP behavior.

60. Propofol in Chronic Cannabis Users: A Mechanistic Link to Cannabinoid hyperemesis?

- Presenting Author: Jonmark Dolendo (Touro University)

Additional Author:

- Brad Haubrich (Touro University)
- Jia Qian Yang (University of California Davis)

Purpose

Cannabinoid hyperemesis syndrome (CHS) is characterized by cyclic nausea, vomiting, and abdominal pain in chronic cannabis users, often relieved by exposure to hot water. Propofol, a widely used GABAergic anesthetic with antiemetic properties, has paradoxically been implicated in exacerbating hyperemetic episodes in some cannabis users. With the growing legalization of marijuana and social acceptance to its recreational use it is believed that this phenomenon will be more ubiquitous to clinicians. This review aims to investigate the mechanistic and clinical evidence linking propofol administration to CHS and to summarize strategies for prevention, diagnosis, and management.

Methods

PubMed and EBSCO were searched for literature addressing: (1) CHS mechanisms, (2) propofol-induced nausea and emesis, and (3) clinical reports of propofol-indcued hyperemesis in cannabis users. Search parameters were iteratively refined to capture both mechanistic studies and clinical reports.

Results

Preliminary PubMed searches yielded 28 articles on CHS mechanisms, 1 article on propofol-induced nausea mechanisms, 1 article directly linking propofol and CHS, and 34 articles on propofol-related emesis mechanisms. Analysis of the literature suggests a potential correlation and indicates that propofol may trigger or amplify hyperemetic episodes in predisposed individuals.

Conclusions

Although limited, current evidence supports a possible mechanistic and clinical association between propofol and CHS exacerbation. Awareness of this potential risk is important for anesthesiologists and clinicians, particularly in settings of widespread recreational cannabis use, to inform prevention, diagnosis, and management strategies.

61. Gaps in Inclusion: Assessing Demographic Diversity in Sex Chromosome Aneuploidy Literature

- Presenting Author: Amanda Sieverts (Touro University)

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- Karli Swenson (University of Colorado)
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Purpose

Sex chromosome aneuploidies (SCAs), including conditions such as Klinefelter syndrome, Turner syndrome, XYY syndrome, trisomy X, and rarer tetrasomies and pentasomies, are associated with a wide range of developmental, cognitive, and physical outcomes. While clinical research on SCAs has expanded over the past two decades, it remains unclear whether the demographic diversity of affected populations is adequately represented in published studies. Understanding the demographic makeup of patients in SCA research is critical to ensuring that findings are generalizable and applicable to all populations.

Methods

We conducted a systematic review of global clinical literature on SCAs published between 2004 and May 2024. Using Ovid MEDLINE® ALL, Embase, and Web of Science, we included all primary clinical studies with at least 10 participants and excluded review papers, clinical guidelines, and case studies. We extracted data on whether studies reported participant demographics, including race, ethnicity, socioeconomic status (SES), and geographic location, and analyzed trends over time and by region, and for those who do present demographic data, if they analyzed data for potential differences by race/ethnicity/SES.

Results

We identified a small number of major research hubs that are responsible for a significant portion of SCA-related publications, primarily located in the US and Europe. International papers rarely presented any metrics of race, ethnicity or SES. US based studies presented metrics more often than international studies, with rates increasing over time, but the rate was still low, with the highest proportion being nearly one quarter of studies publishing race and/or ethnicity in 2024. When demographic data were reported, there was a

consistent overrepresentation of White, non-Hispanic, upper-middle-class individuals, particularly in studies from the United States. This suggests a demographic imbalance in SCA research, raising concerns about the generalizability of current findings.

Conclusions

Our review highlights significant gaps in the demographic representation of patients included in SCA research, with an overrepresentation of certain populations and a lack of inclusion of minoritized groups. To develop a more accurate and equitable understanding of SCAs and improve care for all patients, it is essential that future research intentionally recruits participants from racially, ethnically, and socioeconomically diverse backgrounds. Expanding representation will ensure that clinical findings better reflect the full spectrum of individuals affected by SCAs and promote more inclusive care strategies.

62. Diagnosis and Management of Cervical Ectopic Pregnancy: An Updated Scoping Review

- Presenting Author: Nikoleta Vasileva (Touro University)

Additional Author:

- Trevor Hirata (Touro University)
- Larissa Jordan (Touro University)
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- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Cervical ectopic pregnancy is a rare form of ectopic implantation, accounting for less than 1% of all ectopic pregnancies, but is associated with significant morbidity due to the risk of sudden, life-threatening hemorrhage. Despite the availability of medical and surgical treatment options, there is no standardized approach to guide management. This study aims to provide an updated scoping review of cervical ectopic pregnancy cases reported in recent literature to evaluate diagnostic presentation, management strategies, and clinical outcomes.

Methods

The initial search was conducted using PubMed with the search terms “cervical ectopic pregnancy” and “cervical pregnancy.” Peer-reviewed articles published in English between 2019 and 2025 were included. Reported cases were reviewed for presenting symptoms, treatment modality (medical, surgical, or combined), and outcomes, including the need for hysterectomy.

Results

All reviewed cases initially presented with vaginal bleeding. Medical management alone was utilized in approximately 20% of cases, surgical management alone in 30%, and a combined medical-surgical approach in 50%. Conservative treatment strategies were commonly employed to preserve fertility and reduce hemorrhagic risk. Hysterectomy was required in only a small minority of reported cases, indicating increasing success with uterine-sparing management approaches.

Conclusions

Management of cervical ectopic pregnancy remains highly variable due to the lack of standardized treatment guidelines. Findings from this updated scoping review demonstrate a trend toward conservative and combined management strategies with low rates of hysterectomy. These results contribute to the evolving literature on cervical ectopic

pregnancy and may help inform clinical decision-making, reduce treatment variability, and improve patient outcomes in this rare but high-risk condition.

63. Association Between Surgical Anesthesia Exposure and Hearing Outcomes in Older Adults: A Retrospective Cohort Analysis

- Presenting Author: Samuel Nguyen (Touro University)

Additional Author:

- Aaron Esterson (Touro University)
- Edgar Barajas (Touro University)
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Purpose

Anesthesia exposure during surgery has been shown to impair sensory function, particularly hearing in older adults. Prior studies have demonstrated that drugs like propofol, sevoflurane, or ketamine can impact cochlear function post-operatively. Despite this evidence of acute hearing changes, long-term anesthesia-related auditory outcomes remain unclear and understudied. In this project, we investigate the long-term effects of surgical anesthesia on patients hearing outcomes later in life.

Methods

By leveraging data from round 13 of the National Health and Aging Trends Study (NHATS), an annual interview survey on Medicare beneficiaries, a retrospective data analysis was conducted. The variables utilized were previous anesthesia exposure, current hearing aid use, and current pure-tone averages (n = 8597). Anesthesia exposure was defined as a binary variable (Yes/No) indicating exposure during prior hip, back, heart, or knee surgery.

Results

1.3% of participants reported having undergone any prior anesthesia-associated surgery, and 18.7% reported using a hearing aid. In the adjusted model, individuals with anesthesia exposure had a 1.1 dB lower pure tone average in the better ear compared with those without anesthesia exposure ($p = 0.28$, 95% CI −3.06-0.92) when tested without hearing aids. This association was not statistically significant, indicating no evidence of a difference in hearing thresholds between those with and without prior anesthesia exposure. Prior anesthesia exposure was not significantly associated with hearing thresholds. Findings did suggest that prior anesthesia exposure is associated with lower likelihood of hearing aid use among older adults, independent of age, gender, and race.

Conclusions

The unanticipated results could potentially be attributed to self-reporting bias, specific anesthetics used and surgical considerations that are difficult to account for. However, anesthesia exposure was not linked to objective hearing thresholds, indicating that its impact on sensory function may be related to other factors such as behavior or device function. Further research is suggested to explore if other factors exert a greater influence.

64. Comparing Fall Risk and Functional Recovery after Hip, Knee, or Spine Surgery in Older Adults

- Presenting Author: Elias Wali (Touro University)

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Purpose

Falls in older adults significantly affect mobility, independence, and quality of life. Fear of falling affects nearly half of older adults, including those without prior falls. Pain, reported by approximately 18.7 million U.S. older adults, contributes to reduced activity and has been linked to fear of falling through mobility limitation, psychological effects, and balance impairment. Despite this, nationally representative studies examining postoperative fall risk and functional recovery across hip, knee, and spine surgeries remain limited. This study examines associations between surgery history, demographic and socioeconomic factors, fall risk, and functional recovery among older adults

Methods

This cross-sectional study analyzed data from Round 13 of the National Health and Aging Trends Study (NHATS), a nationally representative survey of Medicare beneficiaries aged 65 and older. Data were collected through in-person interviews in 2024, representing 2023–2024 experiences (n = 8,597). Surgery type was categorized as hip, knee, spine, or combined procedures. Full activities of daily living (ADL) independence was defined as independence in all assessed ADLs. Logistic regression examined associations between demographic, socioeconomic, and surgical predictors and full ADL independence. Proportional odds and Poisson regression models assessed ordered and count-based ADL outcomes. Analyses were conducted in R.

Results

Older adults with a history of hip, knee, or spine surgery had higher odds of falling in the past year (OR 1.56, 95% CI 1.32–1.84) and lower odds of full ADL independence (OR 0.77, 95% CI 0.65–0.91). Hip-only surgery was associated with the greatest reduction in independence (OR 0.33, 95% CI 0.21–0.54). Higher income was consistently associated with greater ADL independence. Age, gender, and most surgery types were not significant predictors. Race was associated with outcomes, with Hispanic participants and those reporting “Don’t know” race showing higher odds of ADL independence, while Black, Other, and Hispanic participants had lower odds of falls compared with White participants.

Conclusions

Surgery history, income, race, and age were key predictors of postoperative functional recovery and fall risk. These findings underscore the importance of incorporating socioeconomic and demographic factors into postoperative fall prevention and rehabilitation strategies.

65. A Review of the Efficacy of Ketamine Use for Treatment-Resistant Depression

- Presenting Author: Sonia Bishara (Touro University)

Additional Author:

- Dr. Mark Santos (Touro University)

Purpose

Depression is a pervasive global illness that claims millions of lives each year. Despite the availability of pharmacologic treatments and established interventions such as electroconvulsive therapy (ECT), many individuals continue to experience persistent or treatment-resistant symptoms. This literature review examines the efficacy of ketamine, a novel N-methyl-D-aspartate (NMDA) receptor antagonist, in the management of treatment-refractory depression and summarizes recent evidence supporting its clinical use.

Methods

A systematic review will be conducted using databases including PubMed, the Cochrane Library, and Consensus, addressing both efficacy and side effect profiles.

Results

Emerging research demonstrates that intravenous ketamine administered at subanesthetic doses produces rapid and robust antidepressant effects in patients with treatment-resistant depression, often within hours of infusion. Several studies also report significant reductions in depressive severity and suicidal ideation; however, these effects tend to wane within days to weeks without maintenance therapy.

Conclusions

Overall, current evidence supports ketamine as a promising, fast-acting treatment for refractory depression, while underscoring the need for continued investigation into its long-term safety and optimal dosing strategies.

66. Dentofacial Effects of Radiotherapy on Pediatric Population with Retinoblastoma

- Presenting Author: Kristi Truong (Roseman University)

Additional Author:

- Joe Cheever (Roseman University)

Purpose

Understanding the dentofacial effects of retinoblastoma and exploring the management and rehabilitation approaches to mitigate these effects is essential for improving the overall quality of life and long-term health of patients.

Methods

Literature search conducted to identify peer-reviewed English language articles pertaining to the dentofacial effects of radiotherapy in retinoblastoma patients, with a particular focus on the pediatric population

Results

The dentofacial abnormalities identified in retinoblastoma patients treated with radiotherapy had a substantial impact on growth and development. Martin et al. (2019) highlighted that facial growth alterations were a common consequence of radiotherapy in retinoblastoma survivors4. These alterations manifested as asymmetry in maxillary and mandibular development, leading to facial disharmony. There was an anteroposterior skeletal deficiency seen in the maxilla, revealing angle class III malocclusion, severe anterior and posterior crossbite, and posterior openbite.

Conclusions

The complexity of these dentofacial abnormalities demonstrates the need for a comprehensive understanding of their etiology, progression, and impact on patients' overall well-being. Understanding the nature and implications of these abnormalities is essential for developing effective management and rehabilitation strategies that address the diverse needs of patients.

67. A Retrospective Pharmacovigilance Study of Esketamine: Analyzing Real-World Adverse Events and Clinical Outcomes via the FAERS Database

- Presenting Author: Leo Job (Touro University)

Additional Author:

- Samuel Nguyen (Touro University)
- Nikita Deng (Touro University)
- Rakesh Singh (University of California Riverside)

Purpose

Esketamine (Spravato), the S-enantiomer of ketamine and an N-methyl-D-aspartate (NMDA) receptor antagonist, represents a novel approach targeting glutamatergic neurotransmission rather than typical antidepressants, which target serotonin or norepinephrine reuptake. Recent approval from the FDA has allowed the use of intranasal Esketamine for the treatment of treatment-resistant depression (TRD), including approval for use without concurrent oral antidepressants, and for adults with MDD experiencing acute suicidal ideation or behavior when administered under the Risk Evaluation and Mitigation Strategy (REMS). Considering its dissociative and euphoric effects, short duration of action, and ease of intranasal administration, the continued evaluation of its safety, tolerability, and clinical outcomes following regulatory approval is necessary.

Methods

This study employed a retrospective pharmacovigilance design, utilizing data from the FDA Adverse Event Reporting System (FAERS). As a comprehensive repository for spontaneous post-marketing surveillance, FAERS captures "real-world" safety signals across heterogeneous patient populations typically excluded from strictly controlled Randomized Controlled Trials (RCTs). Adverse event reports were retrieved from the FAERS database for the period from January 1, 2025, to December 8, 2025. The search was limited to cases where Esketamine was the "Primary Suspect" or "Active Ingredient," yielding 5,893 entries. Data were curated to include only reports where the indication for use was Major Depressive Disorder (MDD) and/or Suicidal Ideation, resulting in 361 high-relevance entries. Extracted data were categorized by reporter type (patient vs. healthcare provider), patient sex, general outcome (serious vs. non-serious), and major organ systems affected (e.g., cardiovascular, psychiatric, or neurological).

Results

Of 5,893 total entries, 361 cases specifically identified major depression or suicidal ideation as the indication. Our analysis revealed a female predominance in reporting. Notably, 230 cases resulted in serious outcomes, including organ-related disorders, hospitalizations, and death.

Primary AE categories included:

Psychiatric (n=112): (e.g., suicidal ideations, anxiety, mania)

Neurological (n=37): (e.g., CVA, migraines, seizures)

Cardiac (n=35): (hypertension, SVT, bradycardia)

Other (n=121): Including therapeutic ineffectiveness and provider error.

Conclusions

These findings underscore the need for continued monitoring and supervision under the REMS program. Although esketamine is approved as a monotherapy, findings of sustained depression and complications suggest it may be prudent to use esketamine in conjunction with oral antidepressants.

68. Cardiovascular Disease as a Mediator of the Diabetes–Dementia Association in Older Adults: NHATS Analysis

- Presenting Author: Khang Le (Touro University)

Additional Author:

- Mary-Francis Garcia (Touro University)
- Gillian Gottlieb (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Diabetes mellitus is associated with poorer cognitive outcomes and increased dementia risk in older adults. Vascular damage is a leading proposed mechanism, and heart disease is more prevalent among adults with diabetes and independently linked to dementia-related outcomes. This study evaluates whether heart disease helps explain (mediates) the relationship between diabetes and dementia/Alzheimer's diagnosis in a nationally representative sample of aging adults.

Methods

This observational study uses data from the National Health and Aging Trends Study (NHATS), a longitudinal cohort of Medicare beneficiaries aged ≥65 years interviewed annually. The independent variable is diabetes. The mediator is heart disease. Outcomes include self-reported clinician diagnosis of Alzheimer's disease and dementia. Dementia-related classification in NHATS is supported by established methods that incorporate diagnosis reports and cognitive assessment frameworks. Mediation analyses estimate the direct association between diabetes and dementia outcomes and the indirect association operating through heart disease, adjusting for key demographic covariates.

Results

Analyses are underway to quantify the extent to which heart disease mediates the diabetes–dementia association. Findings will be presented in the final poster and interpreted in the context of prior NHATS evidence linking diabetes to worse cognition and higher dementia risk over time.

Conclusions

Work in progress

69. How Does Orthodontics Impact Nager Syndrome?

- Presenting Author: Jordan Bretner (Roseman University)

Additional Author:

- Veronica Marr (Roseman University)
- Joseph Cheever (Roseman University)

Purpose

Nager syndrome, first described by Nager and de Reynier in 1948, is an uncommon craniofacial dysostosis that affects early development, day-to-day function, and overall quality of life. The condition arises from abnormal morphogenesis of the first and second pharyngeal arches during embryogenesis, which produces a recognizable combination of craniofacial and limb anomalies. Fewer than one hundred cases have been reported, a number that reflects both the rarity of the disorder and the complexity of care it requires. Successful management usually calls for a coordinated team that includes both medical and dental specialists (Marszałek-Kruk et al., 2024).

Methods

A structured search of PubMed was performed to identify studies relevant to orthodontic management in Nager syndrome. Search terms included “Nager syndrome,” “orthodontic treatment,” “distraction osteogenesis,” “mandibular hypoplasia,” and related craniofacial anomalies. Only English-language publications were considered. Inclusion was limited to work that informed orthodontic strategies and interdisciplinary care for diagnosed patients (Opitz et al., 2000).

Results

The phenotype varies widely, yet several craniofacial features appear repeatedly. Bilateral mandibular hypoplasia, trismus with a restricted oral aperture, a cleft or high-arched palate, and underdeveloped or malpositioned zygomatic structures are common findings (Marszałek-Kruk et al., 2024; Rosa et al., 2015; Kavadia et al., 2004). These changes contribute to dysphagia, delayed speech, and difficulty maintaining oral hygiene. Esthetic concerns and psychosocial stressors are frequent. Mandibular underdevelopment is especially important, since severe deficiency can compromise the airway and feeding in infancy and may persist without early, coordinated intervention (Marszałek-Kruk et al., 2024; Rosa et al., 2015; Kavadia et al., 2004).

Conclusions

Orthodontic care in Nager syndrome extends far beyond tooth movement. It anchors functional rehabilitation, supports development, and contributes to sustained improvements in quality of life. From securing the airway in infancy to final skeletal and esthetic refinements in adolescence, orthodontics remains a backbone of care for this rare craniofacial disorder (Marszałek-Kruk et al., 2024; Opitz et al., 2000; Gürsoy et al., 2008). These interventions create the structural and functional base that allows broader medical and surgical treatment to proceed safely and predictably.

70. Evaluation of Cefiderocol vs Sulbactam/Durlobactam for the Treatment of Carbapenem-resistant Acinetobacter baumannii (CRAB) Infections

- Presenting Author: Walker Mink (Dignity Health St. Rose Dominican)

Additional Author:

- Brett Krautstrunk (Dignity Health St. Rose Dominican)
- Ragini Bhakta (Roseman University)

Purpose

Carbapenem-resistant Acinetobacter baumannii (CRAB) is a critical priority pathogen with limited treatment options and high mortality. Novel antibiotics, including cefiderocol and sulbactam/durlobactam, have emerged as therapeutic options, but comparative data remain limited. The purpose of this study is to evaluate the clinical efficacy of cefiderocol versus sulbactam/durlobactam in the treatment of CRAB infections.

Methods

This retrospective cohort study will evaluate adult inpatients (≥18 years) with culture confirmed CRAB infections treated with either cefiderocol or sulbactam/durlobactam across three Dignity Health St. Rose Dominican campuses from January 1, 2021 to present. Patients will be identified through Cerner electronic medical records and screened by the principal investigator. Inclusion criteria include receiving ≥3 days of cefiderocol or sulbactam/durlobactam for CRAB infection. Exclusion criteria include immunocompromised status (e.g., HIV, chemotherapy) or CRAB osteomyelitis/joint infection.

Results

Work in progress.

Conclusions

Work in progress.

71. Risk of Postoperative Hypotension with Preoperative Antihypertensive Regimens

- Presenting Author: Molly Jordan (Dignity Health St. Rose Dominican)

Additional Author:

- Travis Merkle (Dignity Health St. Rose Dominican)
- Megan Farrell (Dignity Health St. Rose Dominican)

Purpose

There is controversy around holding or continuing antihypertensive medications during the perioperative period. Holding antihypertensives prior to surgery could risk surgical postponement or cancellation; however, continuing antihypertensives can result in hypotension during and after surgery. Guidelines offer no clear recommendations regarding holding or continuing medications, but the antihypertensives that are generally recommended to withhold are renin-angiotensin aldosterone system inhibitors 24 hours prior to surgery unless indicated to continue and loop diuretics the morning of surgery due to acute kidney injury risk. Therefore, the purpose of this study is to evaluate the association between home antihypertensives and postoperative hypotension.

Methods

This is a retrospective chart review study that will evaluate the effects from the continuation of home antihypertensive medications on postoperative blood pressure in patients 18 years and older who were on home antihypertensives per preoperative medication reconciliations and who underwent elective, noncardiac surgeries, which will include carotid endarterectomy, thoracotomy/thorascopy, endovascular abdominal aortic aneurysm repair, or peripheral artery bypass. Excluded patients are those younger than 18 years of age, those who received vasopressors postoperatively in the post-anesthesia care unit and/or intensive care unit for induced hypertension, and those pregnant and/or lactating. Patient charts from January 1, 2023, to August 25, 2025, will be evaluated. Two groups are being evaluated: those who experienced postoperative hypotension and those who did not experience postoperative hypotension. Medication reconciliations performed by nurses will evaluate home antihypertensive medications the patients are on, and the last dose taken for each antihypertensive will be reviewed.

Results

Work in progress

Conclusions

Work in progress

72. Body Composition Changes Associated with GLP-1 Receptor Agonist Drugs

- Presenting Author: Cole Davidson (Touro University)

Additional Author:

- Jarod Pieller (Touro University)
- Joe McCarley (Touro University)
- Tobin Le (Touro University)
- Hailey Roberts (University of Nevada, Las Vegas)
- Mark Santos (Touro University)
- Rakesh Singh (University of California, Riverside)

Purpose

GLP-1 receptor agonists were originally approved by the FDA in 2005 for the treatment of type 2 diabetes. However, clinical use quickly revealed a powerful secondary effect, a significant weight loss. This led to their formal approval for chronic weight management in 2017. Despite their widespread adoption, a critical question remains regarding the quality of weight loss. Specifically, whether these drugs inadvertently reduce vital muscle and bone mass along with body fat.

Methods

To address this, our ongoing observational study tracks participants over 24 months, utilizing FDA-cleared bioelectrical impedance analysis (BIA) scales at months 1, 3, 6, 12, and 24. This technology enables a precise measurement of body composition change over time.

Results

Preliminary results from the first three participants are highly encouraging. While there was a marked decrease in overall body weight and fat mass, analysis showed that muscle and bone mass did not experience a similar significant decline.

Conclusions

These early findings suggest that GLP-1 drugs may be working through biochemical pathways that selectively target adipose tissue while preserving lean mass. This is a vital distinction, as it implies patients can achieve a healthier weight without compromising the physical strength and mobility essential for long-term health. Furthermore, these data suggest that the "muscle wasting" often associated with GLP-1s in popular media may be an individual variation rather than a universal side effect.

73. The efficacy of temporary skeletal anchorage appliances in the correction of skeletal anterior open bite

- Presenting Author: Ryan Howard (Roseman University)

Additional Author:

- Charles Sheffield (Roseman University)
- Mason Mullaney (Roseman University)
- Konstantania Almpani (Roseman University)

Purpose

The purpose of this scoping review was to summarize and evaluate the current scientific evidence regarding the efficacy of Temporary Anchorage Devices (TADs) in the correction of skeletal anterior open bite (AOB).

Methods

A scoping review of the literature was conducted in accordance with PRISMA-ScR guidelines. Six large databases were systematically searched for peer-reviewed human studies evaluating TAD-assisted correction of skeletal AOB. Article screening and data extraction were performed independently by two reviewers using predefined inclusion and exclusion criteria, along with a customized data extraction tool.

Results

Initial correction of skeletal AOB was achieved in all included studies, although anchorage designs varied.

In most cases, intrusive forces were applied to the posterior maxillary dentoalveolar segments.

AOB correction was primarily achieved through counterclockwise mandibular rotation.

Mini-plates produced a greater average amount of first molar intrusion and overbite correction compared to mini-implants/screws.

Treatment duration was comparable between mini-plates and mini-implants/screws.

Reported complications were infrequent and included:

Soft tissue inflammation at insertion sites

Temporomandibular disorder (TMD) symptoms secondary to posterior maxillary intrusion

TAD loosening or failure

Conclusions

Temporary Anchorage Devices appear to be a reliable and effective treatment modality for the correction of skeletal anterior open bite, with generally favorable outcomes and a low incidence of complications.

74. Buprenorphine vs. Full-Agonist Opioids in Arthroscopic Meniscus Surgery: A Narrative Review of Safety and Efficacy

- Presenting Author: Liam clarke (Roseman University)

Additional Author:

- Ghaleb Al-owir (Roseman University)
- Jason Khoury (Roseman University)
- Jake Hobson (Roseman University)
- Jake Rounkles (Roseman University)
- Farhad Kamyar (Roseman University)

Purpose

Purpose Arthroscopic meniscus surgery, while minimally invasive, often involves a postoperative period of acute pain traditionally managed with full-agonist opioids like oxycodone. These medications carry significant risks of respiratory depression and the potential for transition to long-term opioid use disorder (OUD). This research aims to evaluate the feasibility and efficacy of using buprenorphine—a high-potency partial mu-opioid agonist—as a preventative, first-line analgesic. The study will investigate whether buprenorphine can provide superior pain control with a safer pharmacological "ceiling effect," thereby reducing the risk of postoperative dependency and withdrawal in the surgical population. The hypothesis of this review is that perioperative buprenorphine will provide non-inferior analgesia compared to full-agonist opioids while significantly reducing the risk of opioid-induced respiratory depression and subsequent opioid misuse.

Methods

Methods A narrative review will be conducted using PubMed, Google Scholar, and recent clinical practice guidelines (2015–2025). The search will focus on “buprenorphine for acute pain,” “multimodal orthopedic analgesia,” and “opioid stewardship in arthroscopy.” The review will analyze: (1) The comparative efficacy of buprenorphine versus traditional full-agonist opioids in orthopedic settings; (2) The safety profile of buprenorphine regarding respiratory depression and "euphoric" potential; and (3) The evidence for using buprenorphine as a "preventative measure" to occupy opioid receptors while blocking the high-risk effects of standard narcotics. Inclusion criteria will prioritize studies involving opioid-naïve patients and those examining buccal or transdermal formulations of buprenorphine.

Results

Work in progress

Conclusions

Work in progress

75. Mitral Valve Repair Outcomes: A Comparison of Video-Assisted, Sternotomy, and Robotic Techniques

- Presenting Author: Katrina Hung (Touro University)

Additional Author:

- Matthew Chin (Touro University)
- Harmandeep Ghotra (Touro University)
- Nicholas Herrera (Touro University)
- Hailey Krahenbuhl (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Mitral regurgitation is the most prevalent valvular heart disease worldwide. Several surgical approaches have been developed for its treatment, including conventional open sternotomy, robot-assisted thoracic surgery (RATS), and video-assisted thoracic surgery (VATS). Conventional open sternotomy is the oldest and most invasive approach, requiring a large midline incision through the sternum. In contrast, RATS and VATS are newer, minimally-invasive techniques that utilize robotic instruments and video-assisted devices, respectively, to facilitate mitral valve repair through smaller thoracic incisions. Although existing studies have evaluated clinical outcomes for each individual approach, no systematic review has comprehensively compared all three techniques. The purpose of this systematic review is to evaluate the relative advantages and limitations of VATS in comparison with RATS and conventional sternotomy with respect to clinical outcomes.

Methods

This systematic review will be conducted in accordance with the JBI methodology for systematic reviews of effectiveness evidence. Studies included in the review will be experimental, quasi-experimental, and observational studies that evaluate VATS, RATS, and/or conventional sternotomy for mitral valve repair. Subgroup analyses will be performed for specific patient populations, including patients with concurrent chronic pulmonary conditions, congenital conditions, and across different age groups. Clinical outcomes of interest will include hospital time stay, incidence of reoperation, length of cardiopulmonary bypass, post-op complications, intraoperative blood transfusion rate, post-op ventilation time, and mortality rate.

Results

Initial results demonstrate a four-day reduction in hospital length of stay for patients who underwent VATS compared with conventional sternotomy, with no significant difference observed between VATS and RATS. Although cardiopulmonary bypass and aortic cross-clamp times were significantly longer for VATS than for sternotomy and RATS, VATS was associated with a significantly shorter postoperative ventilation time. Intraoperative blood transfusion rates were comparable across all three techniques. Reoperation rates, primarily due to rebleeding, ranged from approximately 1–3%, with no surgical approach

demonstrating superior efficacy. Additionally, multiple studies reported significantly shorter recovery times and earlier return to normal daily activities for patients undergoing VATS and RATS compared with conventional sternotomy.

Conclusions

This study is ongoing and will be further developed into a comprehensive systematic review.

76. QTc effects of intravenous droperidol compared with other antiemetics for nausea and vomiting in the emergency department

- Presenting Author: Mary Louise Leones (MountainView Hospital)

Additional Author:

- Dr. Mickayla Clark (Roseman University)
- Dr. Mark Decerbo (Roseman University)

Purpose

The purpose of this study is to evaluate whether administration of intravenous (IV) droperidol for nausea and vomiting is associated with clinically significant QTc prolongation and/or the occurrence of serious cardiac arrhythmias as compared to other antiemetics. Despite the FDA Boxed Warning, recent evidence suggests minimal cardiac risk at commonly used doses. The primary objective of this study is to evaluate the clinical necessity of routine electrocardiogram (ECG) screening prior to intravenous droperidol administration. This analysis aims to determine whether mandatory pre-administration ECG monitoring is associated with improved patient safety or whether it represents an unnecessary barrier that delays care and contributes to inefficient resource utilization. Findings from this study will drive evidence-based institutional policy adjustments regarding ECG requirements for low-dose droperidol use. Results may also be generalizable to other institutions seeking to streamline antiemetic care by eliminating low-value practices without compromising safety.

Methods

This retrospective chart review, single-center quality-improvement study evaluated adult emergency department patients at a 500-bed, community teaching hospital who received IV antiemetics between September 1, 2025, and November 1, 2025. Pharmacy medication orders and all pertinent clinical data were identified via a clinical decision support software system and the electronic medical record. The primary outcome examined was the incidence of clinically significant QTc prolongation, defined as QTc> 500 ms and/or serious cardiac arrhythmias within 24 hours of antiemetic administration. Secondary outcome assessed dose-related adverse drug reactions among droperidol and comparator antiemetics. Inclusion criteria were defined as: >=18 years and receipt of IV droperidol, ondansetron, metoclopramide, or prochlorperazine in the emergency department for nausea and vomiting. Exclusion criteria were defined as: concurrent medications or conditions known to acutely prolong QTc and receipt of the agents for indications other than antiemetic use (e.g., severe agitation).

Results

Work in progress

Conclusions

Work in progress

77. The Ninth Reported Case of Chondroid Syringoma with Bone Formation

- Presenting Author: Mojan Deriss (Roseman University)

Additional Author:

- Parnian Alizadeh (Harvard University)
- Amir Qorbani (University of California, San Francisco (UCSF))
- Kelsey Ouyang (Cleveland Clinic)
- Voicu Ciobanu (Roseman University)

Purpose

Chondroid syringomas are rare mixed adnexal tumors of eccrine origin, accounting for less than 0.1% of primary neoplasms and most often arising on the head and neck of adult men. Osseous differentiation within chondroid syringoma is exceedingly uncommon, with only eight cases with bone formation reported in the literature. This case represents the ninth documented chondroid syringoma with bone formation and is notable for its large, fixed scalp presentation yet benign histology, features that can clinically mimic malignant variants.

Methods

A 34-year-old man with no significant past medical history presented with a slowly enlarging, firm subcutaneous mass on the right inferior parietal scalp of six years' duration. The lesion was excised via slit incision under local anesthesia; intraoperatively, it was found firmly adherent to the parietal bone and required careful blunt dissection for separation, followed by layered closure. The specimen was submitted for histopathologic evaluation with hematoxylin–eosin staining, and a literature review was performed to identify previously reported cases of chondroid syringoma with bone formation.

Results

Grossly, the tumor measured approximately 3–4 cm, was firm with a gray-white cut surface, and caused both cosmetic and physical discomfort. Histopathology demonstrated bland epithelial cells arranged in cords and tubules with a myoepithelial layer and epithelial–myoepithelial islands in a myxoid stroma, consistent with chondroid syringoma, along with mature lamellar bone embedded within the lesion, confirming chondroid syringoma with bone formation. Postoperatively, the wound healed without complication. Although the patient was lost to in-person follow-up, he reported satisfactory recovery by telephone with no concerns. A review of eight prior cases demonstrated that lesions were smaller, often mobile, and occurred at varied head and neck sites, with this case being among the largest and the only benign example described as fixed to underlying bone.

Conclusions

This case expands the clinicopathologic spectrum of chondroid syringoma with bone formation, underscoring that large, fixed scalp lesions with osseous differentiation may be

benign. Awareness of this rare entity and its atypical fixed presentation can refine the differential diagnosis of calcified or ossified scalp nodules and support complete excision with appropriate histopathologic evaluation as the mainstay of management.

78. Delayed Diagnosis of Dermatofibrosarcoma Protuberans Initially Misclassified as Fibromatosis

- Presenting Author: Marina Youssef (Touro University)

Additional Author:

- Momilani Tupu (Touro University)
- Harshita Sarambale (Touro University)
- Rishi Nanda (Touro University)
- Daniel Jones (Department of Internal Medicine, Sunrise Health GME Consortium, Las Vegas, NV)
- Kyaw Thein (Division of Hematology and Medical Oncology, Comprehensive Cancer Centers of Nevada, Las Vegas, NV)

Purpose

Dermatofibrosarcoma protuberans (DFSP) is a rare dermal sarcoma characterized by aggressive local infiltration and a high risk of recurrence despite minimal metastatic potential. Clinically, DFSP often presents as a painless, slow-growing, firm plaque or mass with pink, violaceous, or reddish-brown discoloration. Although long-term survival is excellent, with 15-year overall survival approaching 100%, delayed diagnosis is common due to its benign clinical appearance. This case highlights diagnostic challenges, disease progression, and the role of longitudinal management in DFSP.

Methods

We report the case of a 56-year-old female who initially presented in 2020 with a left shoulder mass. An excisional biopsy favored desmoid-type fibromatosis, and no additional treatment was pursued. Subsequent imaging in 2023 demonstrated an enhancing lesion involving the medial left teres major muscle, suspicious for DFSP. A second axillary lesion was biopsied and found to be benign. Serial surveillance imaging was performed over time. By 2025, repeat MRI revealed a new mass adjacent to the proximal humerus, indicating progressive disease.

Results

Given the multifocal and infiltrative nature of the lesions, systemic therapy with imatinib was initiated. Ongoing treatment has been well tolerated, labs have been stable and recent CT imaging has demonstrated no evidence of disease progression. This case highlights that DFSP can often be mistaken for benign lesions, such as lipoma, keloid, or dermatofibroma, leading to delayed diagnosis and inadequate initial excision; however early diagnosis is pivotal. Complete surgical resection with negative margins remains the standard of care and most effective curative option. Additionally, ongoing surveillance strategies should be tailored to tumor size, depth, and prior surgical margins. In cases of fibrosarcomatous change or unresectable disease, multidisciplinary management including systemic therapy is essential.

Conclusions

This case underscores the importance of early recognition, accurate diagnosis, and long-term surveillance of DFSP, particularly in patients with recurrent or progressive disease. Primary care and internal medicine physicians play a critical role in identifying atypical dermal masses, facilitating timely referral, and coordinating multidisciplinary care to optimize outcomes.

79. Antimicrobial methods for orthodontic thermoplastic appliances: A literature review

- Presenting Author: Hannah Jung (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

The aim of the literature review is to investigate the effectiveness of various antimicrobial methods towards reducing cariogenic bacteria found on orthodontic thermoplastic appliances such as clear aligners and retainers.

Methods

An electronic search was conducted on PubMed, Google Scholar, and ScienceDirect databases prioritizing publications between 2000 and 2024. Articles were selected based on predefined criteria involving clinical trials, systematic reviews, and peer-reviewed articles. Data extraction involved an integration of findings from selected studies to assess the effectiveness of various antimicrobial strategies. Important factors assessed included the types of antimicrobial agents and impact on microbial colonization and biofilm formation on surfaces of clear thermoplastic appliances. The search utilized keywords such as “thermoplastic”, “antimicrobial or antibacterial”, “orthodontic”, “removable”, “aligner or retainer or appliance”, “oral biofilm”, and “cariogenic bacteria”.

Results

ZnO nanoparticles on aligners have antimicrobial effect against S. mutans, Lactobacillus, and even has some antimicrobial effect against Candida alibcans. ZnO + MgO nanoparticles incorporated in aligners had the highest antibacterial properties

Selenium nanoparticles had antibacterial effects by inhibiting growth of Lactobacillus and S. mutans. These nanoparticles are shown to adhere to cell wall and penetrate cell membranes causing disruption of DNA and thus killing bacteria.

Over the counter orthodontic appliance cleaners, such as retainer cleaning tablets, typically contain citric acid and sodium bicarbonate which can react to help remove biofilm from appliance surfaces. S. mutans was found to be significantly less prevalent when using chlorhexidine.

Vinegar has been shown to have antimicrobial and anti-tartar properties. However, some studies suggest that it is better to avoid using vinegar on orthodontic appliances made of polyurethane and polypropylene.

While brushing is a method of cleaning removable orthodontic appliances, this method increases surface roughness which in turn can allow for bacterial colonization. It was discovered that using a vibrating bath with Cleaning Crystal solution (Align Technology®) was significantly more effective than brushing with toothpaste & chlorhexidine. Ultrasonic vibrations can alter and damage surface of thermoplastic polyurethane showing signs of water absorption and ultrasonic cavitation.

Conclusions

Numerous studies have evaluated the effectiveness of various antimicrobial products for orthodontic thermoplastic appliances. Based on these findings, nanoparticles show great potential, but other options also demonstrate effectiveness. However, a definitive "best" solution has not yet been determined. The research indicates that while the risk of caries can be reduced with these antimicrobial methods, it cannot be completely eliminated. Ultimately, the success of treatment depends largely on the patient's commitment to maintaining good oral hygiene and keeping their aligners clean. While these antimicrobial methods can aid in reducing bacteria, they alone do not guarantee a favorable outcome for the patient's oral health.

80. Using RNA Based Therapies to Lower Lipoprotein (a) May Prove More Effective than Standard Lipid Lowering Practices, A Systematic Review.

- Presenting Author: Kobie Webb (Roseman University)

Additional Author:

- Fidelis Nwachukwu, MD, PhD, MS, BMLS, ASCPCM (Roseman University)

Purpose

Lipoprotein(a) [Lp(a)] is a genetically determined lipid particle associated with increased cardiovascular risk and heightened inflammatory activity. Despite routine use of conventional lipid-lowering therapies, effective management of elevated Lp(a) remains challenging. This review examines limitations of traditional lipid therapies and evaluates emerging RNA-based genetic approaches for lowering Lp(a) and associated inflammatory markers.

Methods

A focused literature review was conducted using major biomedical databases to identify clinical trials, mechanistic studies, and translational research evaluating statins, PCSK9 inhibitors, apheresis, and RNA-based therapies targeting Lp(a). Emphasis was placed on studies assessing Lp(a) reduction and inflammatory outcomes.

Results

Traditional lipid-lowering therapies demonstrate limited and inconsistent effects on Lp(a). Statins show variable responses and may increase Lp(a) levels in some populations, while PCSK9 inhibitors produce modest reductions with limited specificity. Lipoprotein apheresis effectively lowers Lp(a) but is constrained by cost, procedural burden, and limited accessibility. In contrast, RNA-based therapies—including antisense oligonucleotides and small interfering RNAs—directly target hepatic apolipoprotein(a) synthesis and achieve substantial and sustained reductions in Lp(a). Several studies also report concurrent decreases in circulating inflammatory markers and monocyte activation, suggesting potential downstream anti-inflammatory effects.

Conclusions

Conventional lipid therapies remain inadequate for targeted Lp(a) management. RNA-based genetic therapies offer a more precise approach to lowering Lp(a) and modulating inflammatory pathways, addressing key limitations of existing treatments. Continued clinical investigation is warranted to clarify long-term cardiovascular outcomes and safety.

81. Evaluation of Micafungin in Candida auris Infections

- Presenting Author: Caitlin Reyes (MountainView Hospital)

Additional Author:

- Kyle Manning (MountainView Hospital)
- Pavlin Dimitrov (MountainView Hospital)

Purpose

C. auris is a multidrug resistant fungal organism tracked by the United States Centers for Disease Control and Prevention (CDC) that has caused invasive health-care related infections. It is associated with high mortality rates and has become more prevalent in Nevada, with the state accounting for roughly 13% of all cases in the United States according to the CDC. In patients with C. auris, the CDC recommends initial treatment with an echinocandin. Furthermore, although the CDC provides suggested MIC breakpoints for select antifungals for C. auris, these are based on closely related Candida species with minimal data on MIC interpretations for C. auris specifically. The purpose of this study is to assess the effectiveness of the echinocandin micafungin in patients infected with C. auris as well as understand the resistance of C. auris within the institution.

Methods

This is a retrospective chart review of patients who were admitted to MountainView Hospital with at least one culture yielding C. auris that was being treated with micafungin. This study included all hospital admissions from January 2024 – December 2025 where the patient had a positive culture of any type for C. auris and received micafungin This study excluded any patients hospitalized in 2024 who had no MIC data available for their C. auris isolate and patients whose micafungin and admissions in which micafungin was stated to be solely for infection(s) other than C. auris for outcomes data. Primary outcomes include all-cause mortality, hospital length of stay (LOS), and MICs of C. auris isolates. Secondary outcomes include ICU LOS (if any), hospital readmission, time to clearance of C. auris from culture, and duration of micafungin therapy.

Results

To be presented at the 12th Annual Roseman Research Symposium.

Conclusions

To be presented at the 12th Annual Roseman Research Symposium.

82. Concordance Between Vancomycin Trough Concentrations and Bayesian AUC/MIC in Central Nervous System Infections

- Presenting Author: Sammie Mercer (Dignity Health St. Rose Dominican)

Additional Author:

- Lisa Krautstrunk (Dignity Health St. Rose Dominican)
- Ragini Bhakta (Roseman University)

Purpose

To evaluate the correlation between vancomycin trough concentrations and Bayesian-derived AUC/MIC in patients with CNS infections, and determine whether trough-guided monitoring adequately predicts AUC/MIC target attainment.

Methods

This is a retrospective study to determine the correlation between trough based dosing and AUC/MIC in CNS infections. This study will be conducted from November 1, 2025 to May 1, 2026. Patient charts will be reviewed for data that will be utilized in the AUC/MIC Bayesian dosing calculator, InsightRx. Patients included in this study are those that were admitted to Dignity Health Siena from January 1, 2020 to July 31, 2025.

This research project will involve collecting data that already exists in order to determine if any correlation between the vancomycin trough and predicted AUC/MIC exists. Data collection to evaluate the primary and secondary outcomes will include a chart review to determine key patient parameters including age, sex, height, weight, serum creatinine, vancomycin dosing including administration times, and trough levels. If the patient is more than 30% of their ideal body weight, an adjusted body weight will be calculated and utilized for the patient's creatinine clearance. After gathering this information from the patient chart, it will be entered into the Insight RX clinical decision support tool. The calculations and predictions made by Insight RX including AUC/MIC, future dosing options (dose, frequency, AUC/MIC, trough, and peak) associated with these patient specific factors will be calculated and recorded. Identifying patient information including name, date of birth, MRN, FIN, or diagnosis will not be entered into the Insight RX.

Results

Work in progress

Conclusions

Work in progress

83. Comparison of Clinical Outcomes When Switching from Meropenem to Ertapenem for ESBL Infections

- Presenting Author: Mark Allen Ubongen (Dignity Health St. Rose Dominican)

Purpose

Extended-spectrum β-lactamase (ESBL)-producing Enterobacterales are a frequent cause of serious infections and are primarily treated with carbapenems. While meropenem provides broad-spectrum coverage, ertapenem offers a narrower spectrum alternative that avoids unnecessary antipseudomonal activity. This study will evaluate and compare clinical outcomes associated with switching from meropenem to ertapenem for the treatment of ESBL-producing Enterobacterales infections at a community hospital system. The goal of this study is to assess clinical effectiveness, safety, and whether ertapenem maintains outcomes comparable to meropenem while reducing unnecessary antipseudomonal antibiotic exposure.

Methods

This is a pre- and post-implementation cohort study conducted across a three-hospital community system, pending IRB approval. The pre-implementation cohort will include adults ≥18 years of age with ESBL infections treated with meropenem from January 2025-December 2025. The post-implementation cohort will include patients treated with ertapenem, with data collection over a 3-6 month period. Surveillance data provided by TheraDoc will identify patients with positive ESBL cultures and chart review will be done to evaluate patients meeting the inclusion and exclusion criteria. Patients being evaluated must have a positive ESBL culture susceptible to meropenem or ertapenem and receive ≥ 24 hours of therapy. Patients will be excluded if they require antipseudomonal coverage, are admitted to the ICU, or have hypoalbuminemia (defined as albumin < 2.5 g/dL). The primary outcome is a composite clinical cure, defined as completion of therapy with clinical improvement leading to de-escalation or discharge without escalation or 30-day readmission for the same infection. Secondary outcomes include length of stay, days of therapy, time to appropriate therapy, and cost of therapy. Discontinuation of therapy due to hypersensitivity reactions or CNS effects, and incidence of Clostridium difficile infections will be used to assess safety.

Results

This is a work-in-progress poster therefore there are currently no results yet to share.

Conclusions

This is a work-in-progress poster therefore there are currently no conclusions yet to share.

84. The Skin as a Mirror: Pityriasis Rubra Pilaris Reflecting Underlying HIV Infection

- Presenting Author: Julienne Zhou (Touro University)

Additional Author:

- Raquel Wescott (Los Robles Medical Center)
- Sara Azim (Los Robles Medical Center)
- Ramesh Nathan (Los Robles Medical Center)

Purpose

Pityriasis rubra pilaris (PRP) is a rare chronic papulosquamous disorder characterized by follicular hyperkeratosis, erythematous plaques, and palmoplantar keratoderma. An HIV-associated subtype of PRP has been described, often presenting more severely and with poorer response to conventional therapies. Co-infections may further complicate disease course and management.

Methods

A 38 y.o. male with no known past medical history presented with diffuse erythematous plaques, islands of sparing, and scaling consistent with PRP. He had not sought regular medical care previously. During the workup, he was diagnosed with HIV infection and syphilis. HIV status was newly identified at presentation, and syphilis serology was positive. The patient was treated with intramuscular penicillin G for syphilis and was referred for initiation of antiretroviral therapy. Dermatology follow-up was arranged for management of PRP, with the diagnosis supported clinically.

Results

This case highlights an HIV-associated subtype of PRP. HIV-associated PRP tends to occur in younger individuals than classic PRP and can present with more severe, refractory disease. Co-infection with syphilis further complicates the clinical picture and underlines the importance of comprehensive infectious disease evaluation in patients with atypical dermatologic presentations.

Conclusions

PRP can serve as an initial presenting feature of underlying systemic disease, including HIV. Clinicians should consider HIV and other sexually transmitted infections in the differential diagnosis when evaluating atypical dermatologic conditions. Early recognition and coordinated management are essential to optimize outcomes.

85. Family as a Factor: Exploring the Psychosocial Aspects of Somatic Symptom Disorder

- Presenting Author: Andre Ho (Rutgers Health)

Additional Author:

- Julienne Zhou (Touro University)

Purpose

Somatic symptom disorder (SSD) is often underdiagnosed, leading to extensive medical workups and persistent patient distress. While clinicians focus on symptom validation and functional improvement, external factors such as family dynamics can significantly influence patient experiences and illness trajectory.

Methods

We present an 18-year-old male with chronic fatigue and multiple unexplained symptoms, whose extensive medical evaluations yielded no definitive diagnosis. His history was predominantly provided by his parents, who strongly advocated for an undiagnosed physiological condition. When interviewed alone, the patient acknowledged feeling "gaslighted" by his mother's holistic medical approach and showed openness to psychological explanations for his symptoms. This case underscores the challenge of distinguishing patient-driven concerns from parental influence in SSD.

Results

The patient's presentation highlights the role of family dynamics in SSD diagnosis and management. Observing family interactions provided key insights that would have been missed if relying solely on patient self-reporting. Parental reinforcement of illness beliefs may contribute to prolonged diagnostic uncertainty and treatment resistance.

Conclusions

This case illustrates the importance of direct patient interviews and consideration of familial influence in SSD. Future research should explore how family dynamics shape illness perception and treatment outcomes. Clinicians should remain mindful of external factors that may perpetuate symptomatology in patients with SSD.

86. Can Your Dentist Save Your Heart?

- Presenting Author: Lojain Ali (Roseman University)

Additional Author:

- Manas Mandal (Roseman University)

Purpose

Emerging evidence suggests a significant connection between oral health and the development of systemic diseases. The oral cavity has one of the most diverse microbiomes, which contributes to maintaining the body's homeostasis. Any disruption in this diversity leads to oral diseases such as periodontitis. Periodontitis has been associated with many systemic diseases, such as gut problems, diabetes, obesity, and cardiovascular disorders. The purpose of this research is to understand the association between oral microbiome dysbiosis and systemic inflammation due to microbial translocation.

Methods

Our research utilized keyword-based MeSH term accessible peer-reviewed epidemiological, clinical, and experimental published articles that examined correlations between systemic illnesses and periodontal disease. The literature was chosen to assess the mechanisms of immune activation, inflammatory signaling, gastrointestinal tract colonization, and oral bacterial translocation into the circulation.

Results

Entry of oral bacteria (commensals) into the bloodstream via inflamed gums during routine oral procedures has been established in dental patients with gingivitis/ periodontitis. Oral bacteria can also travel to the gut via 'oral-gut axis' due to imbalance in bacterial homeostasis which may contribute to IBD and colorectal cancer. Over accumulation of oral bacteria can also trigger the host immune system causing local and systemic inflammation. Once the bacteria are in the gut, they can alter microbiota causing systemic diseases. For example, Porphyromonas gingivalis infection can increase proinflammatory cytokines IL-1, IL-6 and TNF-alpha. Additionally, bacteria that induce endothelial inflammation due to elevated cytokine levels might cause metabolic and cardiovascular problems as a result of oral dysbiosis.

Conclusions

In conclusion, periodontal disease does not always remain localized. In fact, microbial dysbiosis can be one of the risk factors for systemic diseases. Integrating dental care into other disease prevention should begin with an understanding of how important oral health is to the rest of the body. Our presentation highlights the role of dentists as early identifiers of systemic disease risk.

87. Analysis on Postoperative Functional Recovery After Orthopedic Surgery in Senior U.S. Adults

- Presenting Author: Krishna Patel (Touro University)

Additional Author:

- Elvina Almeida (Touro University)
- Ahmed Elsayed (Touro University)
- Aaron Huynh (Touro University)
- Harshita Sarambale (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

With the aging US population, increasing amounts of orthopedic hip, knee, or spine surgery is being performed on patients 65+. A key postoperative goal in older adults is functional recovery through independence in activities of daily living. However, most studies on postoperative outcomes focus on clinical endpoints including mortality, institutionalization, with little attention towards functional recovery and socioeconomic disparities. This study aims to assess the impact of racial and socioeconomic disparities in functional recovery among individuals who had orthopedic surgery.

Methods

With the aging US population, increasing amounts of orthopedic hip, knee, or spine surgery is being performed on patients 65+. A key postoperative goal in older adults is functional recovery through independence in activities of daily living. However, most studies on postoperative outcomes focus primarily on clinical endpoints including mortality, institutionalization, with little attention being put towards functional recovery and socioeconomic disparities. This study aims to assess the impact of racial and socioeconomic disparities in functional recovery among individuals who had orthopedic surgery.

Results

Participants who had undergone orthopedic surgery had higher odds of experiencing a fall in the past year (OR 1.56, 95% CI 1.32–1.84) and lower odds of full ADL independence (OR 0.77, 95% CI 0.65–0.91), with hip-only surgery particularly reducing independence (OR 0.33, 95% CI 0.21–0.54). Proportional odds and Poisson models of ADL independence count showed similar patterns, with higher income and education levels consistently associated with greater independence, while age, gender, and most surgery types were not significant predictors. Race was associated with functional outcomes, with White participants having higher odds of ADL independence than Black, Other, and Hispanic participants.

Conclusions

Our findings suggest older adults with a history of orthopedic surgery are at higher risk of falls and may have reduced functional independence. SES and race also influence recovery, with higher income and certain racial groups associated with greater ADL independence,

highlighting disparities in post-surgical outcomes. These results underscore the need for targeted interventions and support strategies to improve functional recovery and fall prevention in surgery patients, especially among lower-income and high-risk populations.

88. Computed Tomography Assessment of Conus Medullaris Level Across Pediatric Developmental Stages

- Presenting Author: Katherine (Kiki) Bourekis (Roseman University)

Additional Author:

- Daniel van Tonder (Roseman University)
- Albert van Schoor (University of Pretoria, South Africa)
- Natalie Keough (University of Warwick, Coventry, UK)
- Dietrich Lorke (Roseman University)

Introduction

Lumbar puncture (LP) is a critical diagnostic and therapeutic procedure in pediatric medicine; however, it carries an increased risk of complications in neonates, infants, and children due to age-dependent variability in spinal anatomy. A key determinant of LP safety is the position of the conus medullaris, which terminates at more caudal vertebral levels in younger patients and demonstrates substantial interindividual variation. Despite the routine use of LP in pediatrics, there is a shortage of age-stratified, quantitative imaging data defining conus medullaris level and related anatomical parameters that could guide safe needle insertion. Advances in medical imaging and DICOM-based measurement tools provide an opportunity to establish objective, imaging-based reference values across developmental stages.

Hypothesis

The level of termination of the conus medullaris and dural sac demonstrates statistically significant differences across pediatric developmental stages and early adulthood, with progressive cranial ascent with increasing age. Additionally, CT-based DICOM analysis can reliably quantify vertebral level and depth-related parameters relevant to lumbar puncture planning.

Methods

This retrospective, cross-sectional study will analyze spinal cord computed tomography (CT) scans. The subjects of these CT scans were divided into six distinct age groups: (1) neonates less than 28 days old, (2) infants from four weeks to twelve months, (3) toddlers from one to three years, (4) early childhood from three to five years, middle childhood from five to eleven years, and (5) adolescents from eleven to eighteen. Only CT scans from patients without spinal pathology, congenital malformations, or traumatic injury will be included, as confirmed by radiologic reports. Using DICOM viewer technology, the termination of the conus medullaris will be identified relative to vertebral body levels, and measurements of skin-to-vertebral column depth will be obtained.

Results

No results (work in progress)

Conclusions

This study aims to generate age-stratified, CT-based quantitative data on conus medullaris and dural sac termination and related anatomical measurements relevant to lumbar puncture. Establishing standardized imaging-derived reference values has the potential to improve procedural accuracy, reduce complication rates, and enhance patient safety during lumbar puncture in pediatric populations.

89. Impact of Various Antidepressants on Neural Progenitor Cell Survival and Proliferation

- Presenting Author: Jasnoor Shergill (Roseman University)

Additional Author:

- Mathew Barber (Roseman University)
- Surajit Dey (Roseman University)

Purpose

Antidepressants are widely used for mood disorders and are believed to exert therapeutic effects in part through enhancement of hippocampal neurogenesis and brain-derived neurotrophic factor (BDNF) signaling. Although most antidepressants demonstrate similar clinical efficacy, their comparative neurogenic effects at the cellular level remain poorly characterized. Fluoxetine is the most extensively studied agent in this context, while data on other antidepressant classes are limited. This study aims to compare the effects of multiple antidepressant classes on neural progenitor cell (NPC) survival, proliferation, and BDNF expression, using fluoxetine as a reference comparator. A secondary objective is to explore relationships between in vitro neurogenic effects and long-term clinical outcomes reported in the literature.

Methods

This project consists of a systematic literature review and a prospective in vitro experimental study. The experimental design will utilize the ReNcell™ CX human neural progenitor cell line cultured under standardized conditions. NPCs will be exposed to representative antidepressants from different pharmacologic classes, including fluoxetine (SSRI), duloxetine (SNRI), bupropion (NDRI), and imipramine (TCA), with optional inclusion of ketamine as a mechanistically distinct comparator, across clinically relevant concentration ranges with vehicle controls. Proliferation will be assessed using BrdU or EdU incorporation and Ki-67 immunostaining, while cell survival will be evaluated using viability assays. BDNF expression will be quantified via ELISA or Western blot. Fluoxetine will serve as the internal comparator for relative neurogenic activity. In parallel, published clinical trial data will be analyzed to compare long-term treatment success rates with observed neurogenic effects. The experimental study has been designed but has not yet been initiated.

Results

Research in progress; no experimental data are currently available.

Conclusions

This study is designed to clarify class-level differences in neurogenic potential among antidepressants and to contextualize these effects relative to fluoxetine. Integration of cellular neurogenesis data with clinical outcomes may provide insight into biologic mechanisms underlying antidepressant response.

90. Use of Biotin for Hair Loss: an updated review

- Presenting Author: Omar Salem (Touro University)

Additional Author:

- Jessica Ruggieri (Touro University)
- Basma Salem (Touro University)
- Maariya Syed (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Hair loss is a common clinical and aesthetic concern with significant psychosocial impact, leading many patients to pursue non-prescription supplements perceived as safe and accessible. Biotin (vitamin B7) is among the most widely used supplements for hair loss, despite ongoing uncertainty regarding its efficacy in individuals without biotin deficiency. A prior systematic review by Patel et al. (2017) reported clinical improvements in hair and nail growth among individuals with underlying metabolic or dermatologic pathologies; however, this review was limited to 18 published cases and concluded that there was insufficient evidence to support biotin supplementation in otherwise healthy individuals. Since its publication, additional randomized and controlled trials have become available but have not yet been integrated into a unified analysis. The current study will expand upon the original review conducted by Patel et al. evaluating biotin supplementation for hair-related outcomes.

Methods

This updated meta-analysis will incorporate human studies published since 2017, with emphasis on randomized and controlled designs and clinically relevant hair outcomes.

Results

Work in Progress

Conclusions

The poster will depict whether newer evidence demonstrates statistically significant or clinically meaningful benefits of biotin supplementation for hair-related outcomes, thereby informing evidence-based clinical practice and guiding future research.

91. Complementary and Alternative Medicine Treatments for Common Skin Diseases: An Updated Review

- Presenting Author: Basma Salem (Touro University)

Additional Author:

- Jessica Ruggieri (Touro University)
- Omar Salem (Touro University)
- Maariya Syed (Touro University)
- Katie Vuong (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Skin diseases have a high prevalence across global populations. In 2010, skin disorders were the 4th leading cause of years lost to disability, affecting 30-70% of the population at any given time. Effective management is essential due to their tremendous physical, financial, and psychological burden on afflicted individuals. Complementary and alternative medicine (CAM) encompasses therapies used alongside or in place of conventional medical treatments. Utilization of CAMs is influenced by disease severity, financial barriers to standard treatments, and adverse effects of conventional therapeutics. Natural products such as honey are safe, inexpensive, and readily accessible, with demonstrated antibacterial and anti-inflammatory properties that support wound healing, prompting investigation into their potential role in dermatologic care.

Jones et al. systematically reviewed placebo-controlled trials from 1999-2019 evaluating the efficacy of CAMs in managing atopic dermatitis, acne, and psoriasis. Although individual studies reported improvements in symptoms and disease severity with CAM use, overall analyses found no statistically significant differences between CAM and placebo groups across all three conditions. The present study expands upon the original review to include experimental trials, systematic reviews, meta-analyses, and case reports published between 1999-2025.

Methods

PubMed searches will include the terms “atopic dermatitis,” “psoriasis,” “acne,” “honey,” “turmeric,” “witch hazel,” “aloe vera,” and “tea tree oil.”

Results

Work in progress. Preliminary findings will be presented in the poster.

Conclusions

By incorporating new literature, the findings of this study will reassess the evolving evidence base to allow for a more nuanced evaluation of clinically meaningful outcomes relevant to patient care.

92. Endpoint Governance and Opacity in Biomarker-Guided Oncology Trials: A Systematic Review of Primary Endpoint Selection and Survival Evidence

- Presenting Author: Fidelis Nwachukwu (Roseman University)

Additional Author:

- Mary Obimma (Roseman University)

Purpose

Biomarker-guided oncology trials increasingly rely on surrogate endpoints (e.g., objective response rate [ORR], progression-free survival [PFS]) to enable early interpretability and accelerate therapeutic development in molecularly defined populations. While surrogate endpoints are often used before mature overall survival (OS) data are available, the way endpoints are selected and reported functions as a governance mechanism that shapes evidentiary sequencing. We aimed to characterize endpoint governance, including endpoint transparency (opacity), primary endpoint hierarchies, and OS maturity at primary publication.

Methods

We conducted a PRISMA 2020–guided systematic review of prospective interventional biomarker-guided oncology trials published between 2015 and 2024. Trials were eligible if biomarker status was prospectively used to define eligibility or treatment assignment and a prespecified primary endpoint was explicitly stated in the published report. Two co-primary outcomes were prespecified: (1) endpoint governance structure (prespecified primary endpoint selection and hierarchy) and (2) endpoint transparency (endpoint opacity). Endpoint-opaque trials were quantified but excluded from endpoint-classification analyses by design. Among endpoint-transparent trials, we extracted trial design features, primary endpoint class, OS reporting at primary publication, and OS maturity (mature/final vs. immature/interim) when classifiable. Ridge-penalized logistic regression modeled predictors of ORR primacy and OS immaturity.

Results

Of 2,010 records identified, 242 full-text articles were assessed; endpoint opacity was common, with 166/242 (68.6%) failing to unambiguously identify a prespecified primary endpoint. Seventy endpoint-transparent trials were analyzed for endpoint governance. Surrogate endpoints dominated as primary outcomes: ORR was the primary endpoint in 23/70 (32.9%) trials and PFS in 33/70 (47.1%), whereas OS was the sole primary endpoint in 2/70 (2.9%). ORR primacy was more frequent in feasibility-constrained settings (non-phase III and non-randomized designs). OS was reported at primary publication in 62/70 (88.6%) trials; among OS-reported trials with classifiable maturity (n = 61), OS was mature/final in 30 (49.2%) and immature/interim in 31 (50.8%). In adjusted analyses, ORR primacy was associated with lower odds of immature/interim OS at first publication (OR

0.58; 95% CI 0.37–0.90). Molecular response endpoints (e.g., ctDNA, MRD) were seldom designated as decision-defining.

Conclusions

In biomarker-guided oncology trials, surrogate endpoints frequently function as governance instruments that structure trial design and evidentiary sequencing, rather than as validated substitutes for survival. OS is commonly reported but often immature at primary publication, and endpoint opacity is a pervasive governance failure that limits interpretability. Enhancing endpoint hierarchy transparency, standardizing OS maturity reporting, and ensuring confirmatory strategies are essential for aligning precision oncology development with durable patient benefit.

93. Viral Trends Versus Evidence-Based Recommendations: How Social Media Influences Skincare Practices

- Presenting Author: Jessica Ruggieri (Touro University)

Additional Author:

- Basma Salem (Touro University)
- Omar Salem (Touro University)
- Maariya Syed (Touro University)

Purpose

Social media use has been rising in recent years and has recently become a source to promote skin care products. Anyone on social media can endorse consumer items, whether it be an influencer or a board-certified dermatologist. Viral trends seen on social media may not always have evidence-based skincare practices, possibly leading to adverse skin reactions. The aim of this study is to evaluate consumer's skin care practices influenced through social media, promoted by influencers and board-certified dermatologists.

Methods

A survey will be conducted to target social media users in America. The survey includes information about social media use, trustworthiness of the source they received information from, skincare practices based on social media, and demographic information. The survey will be disseminated via email, social media, and brochures.

Results

The study is currently ongoing, and we will be conducting a mixed-methods analysis on the responses. It is expected that a majority of participants have bought at least one skin care product due to a viral social media trend. Having an adverse skin reaction is predicted to occur, as well as participants being content with their viral purchase. It is anticipated that more consumers will have more trust for a board-certified dermatologist on social media compared to a regular influencer, however it is not expected that consumers will discontinue using products if they find out it is not supported with evidence. Results will be presented in the completed poster.

Conclusions

It is important to evaluate whether consumers are purchasing viral skincare trends that lack of evidence-based treatment in order to avoid adverse skin reactions. Full conclusion will be presented in the completed poster.

94. A Systematic review with Meta analysis components of Pancreatic Cancers (pNET, Exocrine, and pancreatic melanoma)

- Presenting Author: Brett Lieuallen (Roseman University)

Additional Author:

- Voicu Ciobanu (Roseman University)

Purpose

Introduction: Pancreatic cancer is a deadly disease that often remains undiagnosed until the cancer has developed. The pancreas consists of exocrine and endocrine cells that can develop into cancers such as adenocarcinoma for exocrine cells and Pancreatic Neuroendocrine Tumors(pNETs) for endocrine cells. Malignant melanomas can also metastasize to the pancreas. However, pancreatic metastases are rare, ranging from 2 to 5% of pancreatic malignancies 1. The importance of metastases is that it can be difficult to differentiate a primary pancreatic malignancy, such as adenocarcinomas and pNETs, from a metastasis due to similarities in imaging findings2.
Tumor location on the pancreas also plays a major role in treatment plans. Pancreatic cancer often remains undiagnosed because symptoms do not present unless the tumor progresses sufficiently to obstruct the bile duct and negatively affect its exocrine function. At this point, it has developed sufficiently to become metastatic. It also frequently involves the surrounding major arteries 3. This affects treatment as surgeons are unable to make a radical excision 3. Neoadjuvant therapy can decrease the size of the tumors, lessening potential micrometastases 3. Depending on the patient circumstance and the location of the tumor, pancreaticodudenectomies or pancreatectomy are deemed warranted for long term patient survival 4. Some literature also deems combination chemotherapy of FOLFIRINOX, gemcitabine, and a taxane as the standard of care for metastatic pancreatic cancer 5. Considering the high mortality of pancreatic cancer and insufficient reports analyzing the similarities between biologically distinct types of pancreatic cancer, this study seeks to synthesize the literature and their findings regarding the influence of tumor location on treatment and survival. Furthermore, with the rarity of pancreatic melanoma and its similarities to other pancreatic malignancies, this study seeks to distinguish and differentiate these cancers, while emphasizing any similarities.

Methods

Methods: There will be a comprehensive search conducted of medical literature in databases such as PubMed. This search will include search terms such as pancreatic adenocarcinoma, pancreatic melanoma, pNET, pancreatectomy, pancreaticoduodenectomy, and pancreatic chemotherapy. The reference sections of included reports will also be examined for relevant sources. Due to differences in treatment plans and emerging adjuvant therapies, there will be different categorization of the data. Inclusion criteria will consist of cases including adenocarcinoma, pNETs, malignant melanomas, or treatment plans and results for these malignancies. Pancreatic melanoma cases will be labelled as primary or

metastatic when reported. Tumor location will be categorized as head/uncinate versus body/tail. All ages will be included with no discrimination against case publication year. Cases with mortalities from non-malignant causes will be excluded. To analyze the data, Overall survival data will be collected to help form Kaplan–Meier survival curves for cancer type and location. Simple pooled survival rates will also be collected when applicable. Overall survival will be based on diagnosis date, or surgery/treatment date if it is missing. Log rank tests would be utilized to determine statistical significance. Patient treatments will be counted and compared as percentages. To measure statistical significance, Fisher's Exact Test will be utilized if there are small sample sizes. If there are larger sample sizes, Chi-square test will be utilized.
Hypothesis: We hypothesize that survival rates and treatment plans will differ between Exocrine, pNETs, and pancreatic melanoma cancer, and that there will be similar survival rates between pancreatic melanoma cancer located on the tail of the pancreas and pNETs.

Results

No results yet

Conclusions

No conclusions yet

95. Evaluation of Empiric Antimicrobial Therapy in Complicated Intra-Abdominal Infections

- Presenting Author: Ethan Tran (MountainView Hospital)

Additional Author:

- Mickayla Clark (Roseman University)
- Mark Decerbo (Roseman University)

Purpose

Purpose: Empiric antibiotic therapy for intra-abdominal infections (IAIs) is frequently initiated with broad-spectrum regimens to ensure adequate coverage. However, excessively broad coverage may contribute to antimicrobial resistance, adverse events, and unnecessary medication exposure. This study evaluated patients that had documented intra-abdominal culture results and compared clinical outcomes between patients who received broad spectrum antimicrobials versus narrow spectrum.

Methods

Methods: This retrospective chart review, single-center, quality-improvement study included adult patients admitted to a 500-bed, urban teaching hospital with complicated or uncomplicated IAIs who received empiric antibiotic therapy between January 2025 and December 2025 with positive intra-abdominal cultures. Pharmacy medication orders and all pertinent clinical data were identified via a clinical decision support software system and the electronic medical record. Data collected included infection type and location, whether adequate source control was achieved (e.g., surgical intervention, abscess drainage, or removal of infected tissue), initial emergency department dosing, empiric antibiotic regimen, spectrum classification (narrow versus broad), organism isolated, and susceptibility to the empiric regimen. Clinical outcomes included changes from baseline in white blood cell count, temperature, heart rate, and respiratory rate at 72, and 120 hours, signs of worsening infection, need for repeat source control beyond 72 hours, length of stay, and in-hospital mortality. Initial empiric therapy was classified as narrow or broad spectrum (defined as inclusion of antipseudomonal coverage, MRSA coverage, antifungal coverage, or agents typically reserved for multidrug-resistant organisms). Empiric therapy was then categorized as appropriate or as inappropriate if narrower initial therapy would have provided adequate coverage based on culture results.

Results

TBD

Conclusions

TBD

96. Evaluating the Clinical Efficacy and In-Clinic Provider Application of 12-Year Copper IUD Usage

- Presenting Author: Pimthada Bubphamala (Roseman University)

Additional Author:

- Bryan Pham (Roseman University)
- Crystal Lau (Simon Fraser University)
- Kayla Avena (Simon Fraser University)
- Brett Russell (Simon Fraser University)
- Mojan Deriss (Roseman University)
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- Gordon Burns (Roseman University)
- Apurva Pendse (Roseman University)
- Amanda Koziel (Roseman University)
- Denise Davis (Roseman University)

Purpose

The TCu380A Intrauterine Device (ParaGard Copper IUD) is currently FDA-approved and ACOG (American College of Obstetricians & Gynecologists) recommended for 10 years of use. However, clinical data and international guidelines from the World Health Organization (WHO) suggests that contraceptive efficacy remains high for up to 12 years1. It is unclear if current clinical practices still adhere to the 10-year or have adopted the 12-year replacement cycle, allowing patients to less frequently undergo invasive procedures and reduce healthcare costs. The purpose of this study is to evaluate the pregnancy rates of the Copper T380A IUD at the 10-year versus 12-year mark and to identify barriers, if any, to the clinical adoption of evidence-based extended use versus manufacturer-labeled guidelines.

Methods

This study utilizes a dual-phase approach.

Phase I involves a comprehensive literature review of longitudinal trials focusing on pregnancy outcomes between 10 and 12 years of TCu380A usage.

Phase II (currently in progress) consists of a qualitative survey distributed to OB/GYN providers to assess current counseling practices regarding IUD usage length and their willingness to adopt a 12-year WHO recommendation if it is not already current protocol.

Results

Review of existing literature indicates that the cumulative failure rate at 12 years remains approximately 2.2%1, demonstrating no statistically significant decline in efficacy compared to the 10-year cumulative pregnancy rate of 1.9%2. No current survey data exists to assess the proportion of providers that utilizes the 12 year WHO recommendation vs the 10 year ACOG recommendation.

Next Steps

Extended use of the Copper IUD for 12 years appears to be a safe, effective, and cost-efficient strategy for long-term contraception. By reducing the frequency of replacements, patients can decrease frequent procedural risks and improve patient autonomy.

Continued data collection will consist of a qualitative survey distributed to OB/GYN providers to assess current counseling practices regarding IUD expiration and their willingness to adopt a 12-year recommendation. By assessing willingness to adopt a 12-year usage window, this study seeks to identify barriers to implementing extended-use protocols in clinical practice, if it has not already been done so.

97. A Comparison of Outcomes with Alteplase versus Tenecteplase at a Stroke Center: A Preliminary Analysis

- Presenting Author: Alana Whittaker (Roseman University)

Additional Author:

- Kaylee Putney (Roseman University)
- Evan Williams (Roseman University)
- Paul Janda (Valley Hospital Medical Center)
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- Marlai Sai (Valley Hospital Medical Center)

Purpose

Patients who have a thrombotic stroke are screened to determine if they are candidates for thrombolytic therapy and/or thrombectomy. If patients are candidates for thrombolytic, it must be administered within 4.5 hours of the onset of stroke. For many years, alteplase (TPA) was the only thrombolytic used for acute ischemic stroke (AIS); Tenecteplase (TNK) is a new thrombolytic agent which is being used for thrombolysis in AIS. Valley Hospital Medical Center made the switch from TPA to TNK in April 2023 as the thrombolytic of choice for AIS. This was done due to its quicker administration time and ease of use. This study seeks to determine if this switch has any differences in safety or efficacy outcomes.

Methods

This secondary research will utilize electronic medical records to collect data. A list of patients who received a thrombolytic for AIS will be queried. Patients will be included if they are ≥ 18 years, receiving a complete dose of TPA or TNK for AIS. Patients will be excluded if they did not receive a CT brain within 72 hours after receiving the thrombolytic. Demographic information such as age, gender, ethnicity will be collected. Other information such as door to puncture time if thrombectomy performed, National Institutes of Health Stroke Scale (NIHSS), and hemorrhagic conversion will be collected. The objectives of this study are to compare the door to puncture time, NIHSS at discharge or at 90 days or whichever comes first, reduction in NIHSS from before thrombolytic to 24 hours post thrombolytic and rates of hemorrhagic conversion between the two groups. Statistical analysis such as two-sample t-tests and chi-squared tests will be conducted. Statistical analyses will be conducted using SPSS v30.

Results

279 patients were included in the analysis, 120 receiving TPA and 159 receiving TNK. There were 14 bleeds in the TPA group and 19 patients in the TNK group. (p value 0.854) There were 4 in-hospital deaths in the TPA group and 15 in the TNK group (p value 0.055). There were 30 thrombectomies performed in the TPA group and 37 in the TNK group (p value 0.778)

Conclusions

There were similar outcomes with respect to bleeds between the groups but more deaths were seen in the TNK arm.

98. A Comparison of Outcomes with TNK and TPA in Patients Who Received a Thrombectomy for Acute Stroke: The Protocol

- Presenting Author: Alana Whittaker (Roseman University)

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- Marlai Sai (Valley Hospital Medical Center)
- Cameron Yen (Valley Hospital Medical Center)
- Gladys Jarquin (Valley Hospital Medical Center)
- Tyler Colunga (Valley Hospital Medical Center)

Purpose

Patients who have a thrombotic stroke are screened to determine if they are candidates for thrombectomy secondary to a Code White/Large Vessel Occlusion (CW/LVO) and/or thrombolytic therapy. Many patients have both a thrombectomy done and a thrombolytic administered. If patients are candidates for a thrombolytic, it must be administered within 4.5 hours of the onset of stroke. Alteplase (TPA) was the only thrombolytic used for acute ischemic stroke (AIS) for a long time and then tenecteplase (TNK), a new thrombolytic agent, was made the thrombolytic of choice for in acute ischemic stroke (AIS) at Valley Hospital Medical Center in April 2023. This was done due to its quicker administration time and ease of use. This study seeks to determine if this switch has any differences in safety or efficacy outcomes in thrombectomy patients.

Methods

This is IRB approved secondary research utilizing electronic medical records to collect data. A list of patients who received thrombectomy secondary to CW/LVO and given either TPA or TNK will be queried. Patients will be included if they are 18 years and older, candidate for thrombectomy secondary to CW/LVO and administered TPA or TNK within 4.5 hours of symptom onset and excluded if they did not receive a CT brain within 72 hours of a thrombolytic. Demographic information such as age, gender, ethnicity will be collected. Other information such as thrombolytic used, etiology and location of stroke, door to puncture time, National Institutes of Health Stroke Scale (NIHSS), and hemorrhagic conversion will be collected. The objectives of this study are to compare the door to puncture time, NIHSS at discharge or at 90 days or whichever comes first, reduction in NIHSS from before thrombectomy to 24 hours post thrombectomy between the TPA and

TKA groups. Statistical analysis such as independent-sample t-tests and chi-squared tests will be conducted. Statistical analyses will be conducted using SPSS v30.

99. Anchors, Rows, and Risk: Does Double-Row Arthroscopic Rotator Cuff Repair Increase the Incidence of Humeral Head Osteonecrosis? A Systematic Review of Clinical Evidence and Mechanistic Pathways

- Presenting Author: Hussein Awada (Roseman University)

Additional Author:

- Dietrich Lorke (Roseman University)
- Daniel Van Tonderv (Roseman University)

Purpose

Humeral head osteonecrosis (HHO) after rotator cuff repair (RCR) is uncommon but potentially catastrophic, with rapid pain escalation, humeral head collapse, and early conversion to arthroplasty. Since evidence is scattered across case reports and small series, clinicians lack a consolidated description of presentation, timing, operative features, and plausible mechanisms. This literature review aims to determine whether double-row arthroscopic RCR, including transosseous-equivalent/suture-bridge variants, is associated with a higher incidence of HHO compared with other arthroscopic repair techniques, and to summarize operative patterns, timelines, and proposed mechanisms.

Methods

Searches will be performed from inception in MEDLINE/PubMed, Embase, supplemented by citation and reference chasing. Eligible evidence will include adult case reports/series and observational studies describing HHO after arthroscopic RCR, as well as anatomic and mechanistic studies directly informing humeral head perfusion risk relevant to these procedures. Two reviewers will independently screen studies and extract standardized variables related to baseline avascular necrosisrisk, preoperative imaging, procedure details, intraoperative physiology, and outcomes.

Results

Results will be synthesized as an evidence map plus narrative synthesis, summarizing proposed mechanisms, and limitations in complication reporting that restrict robust incidence comparisons.

Conclusions

This review will consolidate dispersed clinical and anatomic evidence to clarify biologically plausible vascular mechanisms for post-surgical HHO, identify potentially modifiable technical and physiologic risk factors, and define research priorities required to quantify and mitigate risk when selecting an arthroscopic procedure.

100. From Nuisance to EPIDemic: Does Trichomonas Play a Role in PID?

- Presenting Author: Karan Anand (Touro University)

Additional Author:

- Shawnt Issakhanian (Touro University)
- Malena Babajanyan (Touro University)
- Megan DeArmond (Touro University)
- Brad A. Haubrich (Touro University)

Purpose

Trichomoniasis is the most common non-viral sexually transmitted infection (STI), with an estimated 156 million new cases annually. Historically, trich has been considered a 'nuisance' parasite because first-line antiparasitics have been effective with the assumption of no long-term complications. However, refractory cases are on the rise, and recent research suggests associations with serious sequelae, including AIDS, reproductive cancers, and pelvic inflammatory disease (PID), which can lead to infertility or ectopic pregnancy. Given the prevalence of trichomoniasis and morbidity of PID, identifying this association can support earlier detection and preventative care.

Methods

Though a relationship between trichomoniasis and PID has been suggested, a systematic review has not been performed. This scoping review follows Joanna Briggs Institute (JBI) methodology to screen biomedical literature for comorbid and premorbid trich and PID. This study follows the PCC framework: Population, trichomoniasis; Concept, PID; Context, clinical cases. The project and protocol are registered on the Open Science Framework (OSF).

Results

A preliminary PubMed search identified limited overlap between trichomoniasis and pelvic inflammatory disease, with no existing systematic reviews directly addressing this association. Inclusion criteria were broad with minimal exclusions, limited to persons with cervixes and clinical studies. The search strategy is being refined and translated for use in additional library databases. This is currently a work in progress.

Conclusions

This review addresses an underexplored overlap in reproductive diseases and fills a critical gap in the literature by systematically evaluating the association between trichomoniasis and pelvic inflammatory disease. Clarifying this relationship will support earlier clinical recognition, targeted screening, and improved management of patients at risk for PID.

101. Diagnostic Disparities and Clinical Phenotypes of Rosacea in Skin of Color: A Retrospective Cohort and Image-Based Validation Study

- Presenting Author: Apurva Pendse (Roseman University)

Additional Author:

- Gordon Burns (Roseman University)
- Mojan Deriss (Roseman University)
- Pimthada Bubphamala (Roseman University)
- Danielle Ambrosio (Roseman University)
- Voicu Ciobanu (Roseman University)

Purpose

Rosacea is a chronic inflammatory skin condition historically characterized and diagnosed based on its presentation in fair-skinned individuals. In patients with darker skin types (Fitzpatrick phototypes IV–VI), hallmark features such as centrofacial erythema and telangiectasia are often subtle or masked by pigmentation, leading to underrecognition and frequent misdiagnosis. Compared to their lighter-skinned counterparts, individuals with skin of color (SoC) are more likely to experience diagnostic delays and are often diagnosed at more advanced disease stages, resulting in greater morbidity and healthcare burden. Despite this recognized clinical challenge, a significant gap persists in large-scale, quantitative research in characterizing these disparities and their downstream effects. This study aims to quantify disparities in the diagnostic journey, clinical presentation, and healthcare utilization between patients with SoC and non-Hispanic White patients with rosacea using multi-source retrospective data.

Methods

We propose a retrospective, matched cohort study utilizing two complementary data sources: a multisite electronic health record (EHR) database and a linked dermatology-specific clinical image registry.

Three cohorts will be constructed from the EHR:

SoC with Rosacea: Adults (≥18 years) with an incident rosacea diagnosis (ICD-10 L71.*) and Fitzpatrick skin type IV–VI.

Non-SoC with Rosacea: Adults with rosacea and Fitzpatrick skin type I–III, matched 1:1 to Cohort 1 on age, sex, and index year.

SoC without Rosacea: Adults with skin type IV–VI and no rosacea diagnosis, matched on age and sex to establish baseline comorbidity rates.

Key outcomes will include:

Diagnostic Delay: Time from first dermatology encounter to rosacea diagnosis.

Misdiagnosis Burden: Number and type of intervening dermatologic diagnoses prior to rosacea.

Clinical Complexity: Prevalence of relevant comorbidities (e.g., autoimmune, gastrointestinal, ocular) and documentation of rosacea-associated pigmentary changes (post-inflammatory hyperpigmentation).

Healthcare Utilization: Number of dermatology visits and total dermatology-related costs in the 24 months following diagnosis.
To validate phenotypic differences, a blinded panel of dermatologists will review clinical photographs from the image registry to assess the predominant clinical features of rosacea (e.g., erythema, papules, telangiectasia, dyspigmentation) across perceived skin types.

We hypothesize that, compared to non-SoC patients with rosacea, the SoC cohort will demonstrate:
A significantly longer interval from first dermatology visit to rosacea diagnosis.
A higher number of incorrect dermatologic diagnoses prior to definitive rosacea diagnosis.
A greater documented burden of pigmentary sequelae and higher rates of specific comorbidities.
Increased post-diagnosis healthcare utilization, indicative of more complex or advanced disease at diagnosis.

Results

Work in progress

Conclusions

Work in progress

102. Management of Severe Gingival Hypertrophy in Orthodontic Patients

- Presenting Author: Kwame Otuo-Achampong (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

Gingival hypertrophy poses a significant obstacle in orthodontic treatment, particularly when fixed appliances are involved. This review covers the complex interrelations among mechanical stress, microbial shifts, and immune-mediated responses that collectively fuel the condition. Fixed orthodontic devices often foster an environment where dental plaque can accumulate, thereby initiating a cascade of inflammation that culminates in gingival enlargement. In addition, changes in the oral microbiome—especially the rise in pathogenic species such as Porphyromonas gingivalis and Streptococcus anginosus—intensify the hypertrophic process. Elevated levels of inflammatory mediators, notably interleukin-1 beta (IL-1β) and transforming growth factor-beta 1 (TGF-β1), further amplify tissue overgrowth. Management strategies span from rigorous noninvasive periodontal therapies to surgical interventions like gingivectomy in severe cases, with adjunctive antimicrobial treatments playing a critical role. Crafting treatment to individual cytokine profiles and genetic predispositions holds the promise of markedly improving clinical outcomes.

Methods

Search Strategy

A comprehensive search of academic databases—including PubMed, Scopus, and Google Scholar—was conducted using keywords such as "gingival hypertrophy," "orthodontic treatment complications," "periodontal pathogens," "inflammatory cytokines," and "management strategies." The search was restricted to English-language publications from 2000 to 2023.

Inclusion Criteria

This review includes peer-reviewed articles that:

1. Discuss the etiology, pathophysiology, and management of gingival hypertrophy in orthodontic patients.
2. Report on clinical trials, observational studies, or systematic reviews focusing on the mechanical, microbial, and immunological aspects of gingival hypertrophy.
3. Evaluate the effectiveness of therapeutic interventions ranging from noninvasive techniques to surgical treatments.

Exclusion Criteria

The following were excluded:

1. Articles not specifically addressing gingival hypertrophy related to orthodontic treatments.
2. Studies focusing exclusively on non-orthodontic induced gingival overgrowth.
3. Commentaries, editorials, and non-peer-reviewed conference abstracts.

Data Analysis

Data were qualitatively analyzed to identify recurring themes and discrepancies among studies. Emphasis was placed on the interplay between mechanical stress from orthodontic devices and the subsequent biological responses in gingival tissues. Statistical outcomes—including pathogen prevalence and treatment efficacy comparisons—were considered, along with the varing methods across the selected studies. The comprehensive approach allowed for a balanced combination of the multifactorial nature of gingival hypertrophy in orthodontic patients, providing insights to guide future research and clinical practice.

Results

This review consistently points to mechanical irritation from fixed orthodontic appliances as a primary trigger for gingival hypertrophy. This form of irritation promotes plaque accumulation, which sets the stage for chronic inflammation and tissue overgrowth. Microbiological analyses revealed a significant increase in pathogens such as Porphyromonas gingivalis and Aggregatibacter actinomycetemcomitans in hypertrophic tissues compared to controls. Immunologically, elevated levels of IL-1β and TGF-β1 were strongly correlated with gingival enlargement, highlighting the role of inflammatory responses in the condition's pathogenesis. Therapeutic approaches vary widely—from enhanced oral hygiene and targeted antimicrobial therapy for mild to moderate cases to surgical interventions for severe manifestations—underscoring the need for a tailored, multifaceted treatment strategy.

Results from Key Studies

Study 1: Gong et al. (2011)

Gong et al. (2011) explored the clinical, microbiological, and immunological parameters in 24 adolescents undergoing fixed orthodontic treatment. They observed significantly elevated plaque index (PI), probing depth (PD), and gingival hypertrophy index (HI) in the test group compared to controls. Elevated levels of IL-1β and TGF-β1 in the gingival crevicular fluid reinforced the role of these cytokines in tissue overgrowth. The study concluded that an effective management plan must target both microbial and immunological factors to control gingival hypertrophy.

Study 2: Kwon et al. (2015)

In a case study, Kwon et al. (2015) managed a patient with severe gingival hypertrophy using intensive nonsurgical periodontal therapy, including scaling, root planing, and stringent oral hygiene instruction. Over five weeks, the patient's gingival overgrowth was completely resolved without surgical intervention. This study highlights the potential success of nonsurgical approaches, particularly when patients strictly adhere to prescribed oral hygiene routines and maintenance visits.

Study 3: Robo et al. (2021)
Robo et al. (2021) focused on the microbial changes induced by fixed orthodontic appliances, noting a significant increase in pathogenic bacteria such as Streptococcus anginosus. This microbial shift, compounded by the inherent challenges in maintaining optimal oral hygiene, was found to contribute to both the persistence and severity of gingival hypertrophy. The study recommends incorporating adjunctive antimicrobial therapies to manage bacterial loads and reduce the risk of recurrence.

Conclusions

Gingival hypertrophy in orthodontic patients is a complex disorder arising from the compounding effects of mechanical irritation, microbial dysbiosis, and immune-mediated inflammation. The accumulation of plaque around fixed orthodontic appliances creates a microenvironment that not only supports the growth of pathogenic bacteria but also triggers an inflammatory cascade mediated by cytokines such as IL-1β, TGF-β1, IL-6, and TNF-α (Gong et al., 2011; Jones et al., 2017; Robo et al., 2021). This inflammation, compounded by patient-specific genetic factors (Patel et al., 2023), results in the progressive overgrowth and fibrosis characteristic of gingival hypertrophy.
The evidence underscores the importance of early, proactive intervention. Nonsurgical periodontal therapies have demonstrated efficacy in managing early-stage hypertrophy, particularly when patients adhere to rigorous oral hygiene protocols (Kwon et al., 2015). In more severe cases, surgical interventions such as conventional gingivectomy or advanced diode laser procedures offer effective means of reducing hypertrophic tissue, although these must be complemented by continued maintenance and adjunctive antimicrobial treatments to prevent recurrence (European Journal of Orthodontics, 2019; Robo et al., 2021).
Looking forward, the combonation of advanced diagnostic techniques—including high-resolution imaging and biomarker analysis—will play a pivitol role in the early detection and monitoring of gingival changes. These technologies, coupled with upcoming therapeutic approaches such as gene therapy and nanotechnology-based drug delivery systems (Kumar et al., 2021; Chen et al., 2022), hold the hope of transforming the management of gingival hypertrophy from a largely reactive process to one of targeted prevention and personalized care.
Ultimately, the management of gingival hypertrophy requires a comprehensive, patient-centered approach that combines traditional periodontal therapies with innovative, tailored interventions. Future research should continue to explore the molecular mechanisms underlying the condition, refine diagnostic tools for early detection, and develop targeted treatments that address both the inflammatory and fibrotic components of gingival overgrowth. By embracing these integrated strategies, clinicians can hope to improve overall patient outcomes, enhance the success of orthodontic treatments, and lay the foundation for a more modernized era of personalized periodontal care.

103. Effects of Maxillary Expansion Techniques in Adults with Obstructive Sleep Apnea: A Review Article

- Presenting Author: Nader Karimi (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

To review the available literature related to different maxillary expansion techniques and evaluate their effectiveness in the treatment of OSA in adults.

Methods

A review was conducted and reported according to PRISMA guidelines
Eligibility Criteria
Population: Male and female adults (≥ 18 years) with OSA
Intervention: Maxillary expansion techniques
Comparator: Other active treatment, placebo, no treatment
Outcomes: Apnoea-Hypopnea Index, Oxygen Desaturation Index, Other subjective and/or objective measures related to OSA
Study design: Research studies published in English in the last 10 years.

Results

Of the included nine studies, two were systematic reviews and seven collected primary data. The two systematic review (Abdullatif et al., 2016; Oliveira et al., 2022) suggested that maxillary expansion techniques particularly Surgically Assisted Rapid Maxillary Expansion (SARME), Distraction Osteogenesis Maxillary Expansion (DOME), and Mini-Implant Assisted Rapid Palatal Expansion (MARPE) significantly improved OSA outcomes including the apnea-hypopnea index, oxygen desaturation index, and Epworth sleepiness scale.
The remaining 7 studies also reported that maxillary expansion techniques significantly improved OSA outcomes.

Conclusions

Maxillary expansion techniques such as Surgically Assisted Rapid Maxillary Expansion (SARME), Distraction Osteogenesis Maxillary Expansion (DOME), and Mini-Implant Assisted Rapid Palatal Expansion (MARPE) effectively improve OSA outcomes including apnea-hypopnea index, oxygen desaturation index, Epworth sleepiness scale, lowest oxygen saturation, Quebec sleep questionnaire scores, and nose obstruction symptom evaluation.

104. Craniofacial effects of sickle cell anemia

- Presenting Author: Olivia Gangmark Strickland (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

Sickle cell anemia (SCA) is a recessive hereditary hematological disorder characterized by the presence of abnormally shaped red blood cells, resulting from a single point mutation in the β-globin gene of hemoglobin. This mutation leads to the formation of hemoglobin S (HbS), which causes red blood cells to assume a characteristic sickle shape after delivering oxygen to tissues during normal circulation. These cells undergo rapid destruction due to their shortened life span and subsequently cause anemia. The sickled cells obstruct small and medium sized blood vessels causing damage to the endothelial lining ultimately resulting in tissue necrosis (Powars, 2022). The clinical manifestations of sickle cell anemia are diverse and encompass a wide range of organ systems, including the craniofacial region. This literature review will investigate the craniofacial effects of sickle cell anemia, particularly in relation to growth abnormalities and dental manifestations.

Methods

The literature review conducted in this study aimed to identify and analyze scientific articles related to the craniofacial effects of sickle cell anemia. The primary database used for this search was PubMed. The search strategy employed a combination of Medical Subject Headings (MeSH) terms and keywords related to sickle cell anemia and craniofacial manifestations.

Results

The literature search yielded a total of five scientific articles relevant to the craniofacial effects of sickle cell anemia, focusing particularly on dental and skeletal manifestations. These studies employed diverse methodologies, including clinical evaluations, radiographic assessments, and cephalometric analyses, aimed at exploring the craniofacial alterations associated with sickle cell disease.

The following craniofacial effects, presented in order of frequency, were found:
Skeletal class II presentation
Mandibular retrusion
Posterior mandibular rotation (clockwise)
Long lower face height
Protracted and proclined maxillary anteriors

Maia et al. (2011) discussed facial aesthetics in patients with SCA and found that only 26%

of patients has a displeasing facial appearance despite 72% of the presented patients presenting convex facial profiles. From this, we can conclude that the craniofacial effects of SCA, in most cases, aren't severe.

Conclusions

The observed craniofacial alterations in SCA may result from a combination of genetic predisposition, chronic anemia, hypoxia-reperfusion injury, and altered bone metabolism. Chronic anemia and tissue hypoxia can disrupt normal bone remodeling processes, leading to skeletal abnormalities such as craniofacial bone dysplasia and malocclusion. Additionally, increased bone marrow activity in response to chronic hemolysis may contribute to hyperplastic changes in the craniofacial bones, further exacerbating skeletal deformities.
The clinical implications of craniofacial manifestations of SCA extend beyond aesthetic concerns, encompassing functional and psychosocial aspects. Skeletal abnormalities and malocclusion can impair masticatory function, speech articulation, and oral hygiene maintenance, potentially compromising the overall quality of life in affected individuals.
Moving forward, future research endeavors should aim to expose the underlying mechanisms driving craniofacial alterations in SCA, employing advanced imaging modalities and analyses. Longitudinal studies are warranted to explore the progression of craniofacial manifestations over time and their relationship with disease severity and treatment modalities. Additionally, interdisciplinary collaboration between hematologists, orthodontists, maxillofacial surgeons, and geneticists is essential to develop comprehensive management strategies tailored to the unique needs of individuals with SCA.
In conclusion, the discussion underscores the craniofacial effects associated with SCA and emphasizes the importance of multidisciplinary approaches in addressing these manifestations. By furthering our understanding of SCA-related craniofacial alterations, clinicians and researchers can strive towards improving patient outcomes and the overall quality of care for individuals affected by this hematological disorder.

105. Relationship between eating disorders and the outcome of orthodontic treatment

- Presenting Author: Brandon Silvestry (Roseman University)

Additional Author:

- Dr. Joseph Cheever (Roseman University)

Purpose

During this literature review, we will discuss the various types of eating disorders and how it relates to orthodontic treatment, how eating disorders can directly affect orthodontic tooth movement, and the practice guidelines recommended for early intervention and treatment.

Methods

This literature review provides an overview of In-vitro studies, case reports and systematic reviews regarding eating disorders and its relationship to the outcome of orthodontic treatment in children and adolescents from the ages of 7-19. Databases used include PubMed, Frontiers in Oral Health, and Medline. The search strategy involved a combination of key words including “orthodontic treatment,” “eating disorders,” “challenges in orthodontic treatment,” “children and adolescents,” “shear bond strength,” “dental erosion,” “prolonged orthodontic treatment.” Selection of the researched articles was determined by the relevance of the abstract to the proposed research question, design of the study and supporting information relevant to the study. Inclusion criteria included research articles published within the last 15 years

Results

Eating disorders tend to begin during the same time orthodontic treatment is recommended, usually around adolescences. A variety of oral manifestations have been associated with the onset of eating disorders, potentially contributing to prolonged orthodontic treatment. One must consider all aspects of the oral cavity when undergoing orthodontic treatment including the patient’s periodontal health, caries risk, bone turnover and the balancing of pH levels via salivary flow. Based on the data gathered during this literature review, it can be concluded that oral health can be compromised by eating disorder behaviors, potentially prolonging or delaying orthodontic treatment

Conclusions

Children and adolescence with eating disorders should be regarded as high-risk patients for orthodontic treatment due to the gingival inflammation, reduced salivary flow and pH levels associated with the conditions5. While evaluating gingival health of patients with anorexia nervosa, research suggests an increased risk in bleeding upon probing, bone loss and tooth movement, which are all factors to consider while performing orthodontic treatment5. Increased bracket bonding failure rates have also been observed due to the acidic oral

environment associated with this patient population19,20. A meta-analysis revealed an increased likelihood of white spot lesions found in patients with eating disorders. These lesions, paired with fixed orthodontic appliances have a greater than 45% increase in dental caries compared to healthy individuals5,8. Due to the oral side effects caused by eating disorders, maintaining oral hygiene is an important factor for the success of orthodontic treatment. Once severely affected, orthodontic treatment would need to be postponed in order to prevent further harm to the oral cavity. Educating patients with eating disorders about fluoride supplements and xylitol chewing gum are useful to reduce the effects of gastric acids directed to the dentition13,17. Although research has indicated weight fluctuations and dietary restrictions during orthodontic treatment, the association between orthodontic treatment serving as the onset of eating disorders remains unclear and needs further research. Multidisciplinary approaches should be used to address psychiatric disorders in children and adolescents.

106. The Evaluation of the Limitations of Clinical Efficacy and Practicality of Nasoalveolar Molding Device

- Presenting Author: Hyma Moparthi (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

Nasoalveolar molding (NAM) is a presurgical orthopedic technique used in infants with cleft lip and/or palate (CLCP) to reduce cleft severity and improve nasal and alveolar morphology prior to surgical repair. Despite its widespread adoption in cleft care centers, uncertainty remains regarding its clinical effectiveness, practicality, and long-term benefits. The purpose of this study was to critically evaluate the existing evidence on NAM with respect to these domains and to assess whether it represents a meaningful advancement in presurgical cleft management.

Methods

A qualitative systematic review of the literature was conducted using structured searches of PubMed and Google Scholar. Peer-reviewed studies published in English that examined NAM in patients with cleft lip and/or palate and reported outcomes related to effectiveness, practicality, or long-term impact were included. Following screening and full-text review, 19 studies met the eligibility criteria. Data were extracted and analyzed using a thematic synthesis approach focusing on clinical efficacy, long-term outcomes, treatment burden, and feasibility.

Results

The majority of included studies reported short-term improvements in nasal symmetry, columellar length, and reduction of alveolar cleft width following NAM therapy. Some studies suggested improved surgical conditions at the time of primary lip repair; however, findings regarding reductions in secondary surgical revisions were inconsistent. Evidence supporting sustained long-term morphological, functional, or aesthetic benefits was limited. NAM was also associated with a high treatment burden, including frequent clinical visits, reliance on specialized providers, caregiver demands, and access-related challenges. Methodological limitations such as heterogeneous protocols, small sample sizes, and limited long-term follow-up were common across studies.

Conclusions

NAM appears to provide short-term presurgical improvements in infants with cleft lip and/or palate; however, current evidence does not consistently support durable long-term benefits. Significant practical and socioeconomic barriers further complicate its routine use. These findings highlight a gap between widespread clinical adoption and the strength of

available evidence, underscoring the need for standardized treatment protocols and high-quality longitudinal studies to better define the role of NAM in contemporary cleft care.

107. Orthodontic Intervention and Crouzon Syndrome

- Presenting Author: Samantha Golod (Roseman University)

Additional Author:

- Joseph Cheever (Roseman University)

Purpose

This literature review synthesizes current literature on the oral manifestations of Crouzon syndrome to enhance understanding among dental and medical professionals and to highlight implications for diagnosis, treatment planning, and interdisciplinary care. The hypothesis proposes that while both interceptive and comprehensive orthodontic modalities are used, early, multidisciplinary intervention results in more favorable long-term craniofacial and functional outcomes than delayed or isolated orthodontic treatment.

Methods

A comprehensive literature search was conducted using PubMed, ScienceDirect, Scopus, and Google Scholar for studies published between 2000 and 2025. Search terms included "Crouzon syndrome," "orthodontic treatment," "interceptive orthodontics," "comprehensive orthodontics," "multidisciplinary treatment," and "functional outcomes." Studies were included if they reported orthodontic or craniofacial treatment strategies, whether interceptive or comprehensive, with outcomes relevant to craniofacial morphology or function, and excluded if they focused solely on non-orthodontic management. Data extracted from eligible studies included patient demographics, treatment type and timing, involvement of interdisciplinary teams, treatment duration, and treatment outcomes. Analyses compared early multidisciplinary approaches with delayed or single-discipline interventions, and patterns in clinical trends, research gaps, and outcomes were identified.

Results

Patients with Crouzon syndrome commonly present with midfacial hypoplasia, maxillary deficiency, mandibular prognathism, crossbite, crowding, and a V-shaped dental arch, along with dental anomalies such as delayed eruption, hypodontia, and abnormal tooth morphology. Functional issues frequently include difficulties with mastication, speech, and airway function, as well as reduced midfacial depth and maxillary length. Orthodontic treatment modalities vary by age and severity: early interceptive interventions, including expansion, facemask therapy, and functional appliances, have been shown to improve occlusion, dental alignment, facial balance, and airway outcomes, whereas adolescent and adult patients often require comprehensive, surgical approaches such as Le Fort III osteotomy, bimaxillary surgery, or distraction osteogenesis, typically preceded by presurgical orthodontics to optimize postoperative occlusal and skeletal results. Early intervention is associated with favorable craniofacial growth and reduced skeletal discrepancies, whereas delayed treatment necessitates more extensive surgical correction; studies report an improvement in midfacial projection and occlusion with early, interdisciplinary care. Multidisciplinary management involving orthodontists, craniofacial

surgeons, pediatric dentists, ENT specialists, and speech therapists consistently yields superior outcomes in airway, speech, and occlusion compared with isolated or single-discipline approaches.

Conclusions

Crouzon syndrome is associated with significant craniofacial, dental, and functional abnormalities affecting growth, occlusion, and airway health. The literature supports early, multidisciplinary interceptive orthodontic intervention, which is associated with improved craniofacial development, better functional outcomes, and reduced severity of skeletal discrepancies. In contrast, delayed or isolated treatment more often requires complex surgical intervention. These findings emphasize the importance of timely diagnosis and coordinated interdisciplinary care to optimize long-term outcomes in patients with Crouzon syndrome.

108. Scoping Review of Skeletal Anchorage in Forsus Appliance Therapy: Reported Dental and Skeletal Effects in Class II Correction

- Presenting Author: Dominique Duong (Roseman University)

Additional Author:

- Val Cheever (Roseman University)

Purpose

The objective of this scoping review is to identify and synthesize the available evidence on the skeletal and dental effects of skeletal anchorage–supported Forsus appliance therapy in patients with Class II malocclusion. Specifically, this review aims to characterize reported treatment outcomes, compare skeletal versus dentoalveolar contributions to Class II correction, and identify gaps in the current literature to inform future research and clinical application.

Methods

This review was conducted in accordance with PRISMA-ScR guidelines. A comprehensive literature search was performed across electronic databases to identify studies evaluating Forsus appliance therapy with and without skeletal anchorage. Studies comparing conventional Forsus therapy to skeletal anchorage–supported Forsus therapy were considered. Systematic reviews and meta-analyses were excluded to avoid duplication of primary data. Eligible studies included human clinical investigations that reported skeletal and/or dental treatment outcomes. Skeletal anchorage methods included maxillary and/or mandibular miniplates and mandibular miniscrews. Extracted data focused on cephalometric skeletal outcomes (e.g., SNB, ANB, Co–Gn) and dental outcomes (e.g., incisor inclination, IMPA). Findings were synthesized using a descriptive, inductive approach, and no meta-analysis was performed due to heterogeneity in study design, anchorage configuration, and outcome reporting.

Results

Overall, the findings suggest that incorporating skeletal anchorage results in a greater skeletal contribution to Class II correction and improved control of undesirable dentoalveolar side effects compared with conventional Forsus therapy. Across the included studies, skeletal anchorage–supported Forsus therapy was consistently associated with favorable skeletal changes, including increases in SNB and mandibular length (Co–Gn), along with reductions in ANB. These effects were observed across multiple anchorage designs, including mandibular symphysis miniplates, mandibular miniscrews, and bimaxillary miniplates. Notably, studies utilizing bimaxillary miniplates demonstrated minimal maxillary change alongside mandibular advancement, suggesting enhanced anchorage control and a reduction in maxillary dentoalveolar compensation. In contrast, mandibular-only anchorage systems showed variability in the magnitude of skeletal response, likely reflecting differences in force vectors, growth status, and appliance configuration. Dental effects differed substantially between skeletal anchorage–supported

and conventional Forsus therapy. Several included studies reported reduced incisor flaring or even retroclination when skeletal anchorage was employed. Miniscrew-anchored and miniplate-anchored systems were particularly effective in minimizing increases in IMPA and controlling lower incisor inclination, although isolated studies still reported residual dental compensation. These findings suggest that while skeletal anchorage reduces dentoalveolar side effects, it does not completely eliminate them. The heterogeneity of study designs, anchorage types, outcome measures, and patient characteristics limits direct comparison across studies.

Conclusions

Skeletal anchorage–supported Forsus appliance therapy demonstrates a trend toward greater skeletal contribution to Class II correction compared with conventional Forsus treatment, with more favorable changes in mandibular position and length and improved control of dentoalveolar side effects. Across the included studies, various anchorage designs—including mandibular miniscrews, mandibular symphysis miniplates, and bimaxillary miniplates—were associated with increases in SNB and Co–Gn and reductions in ANB, although the magnitude of these effects varied. Dental compensation, particularly mandibular incisor proclination, was generally reduced with skeletal anchorage but not entirely eliminated. Interpretation of these findings is limited by heterogeneity in study design, anchorage configuration, and outcome reporting, as well as the predominance of lower-level evidence. Future high-quality randomized controlled trials with standardized cephalometric outcomes and long-term follow-up are needed to better define the clinical effectiveness, stability, and indications for skeletal anchorage–supported Forsus therapy.

109. Comparing Return-to-Play Timelines of Ulnar Collateral Ligament Reconstruction Versus Reconstruction with Internal Brace Augmentation in Baseball Pitchers

- Presenting Author: Jake Hobson (Roseman University)

Additional Author:

- Jacob Rounkles (Roseman University)
- Ghaleb Al-Owir (Roseman University)
- Jason Khoury (Roseman University)
- Liam Clarke (Roseman University)
- Daniel Moses (Roseman University

Purpose

The gold standard for treating symptomatic ulnar collateral ligament (UCL) insufficiency in baseball pitchers has long been UCL reconstruction (UCL-R) or, more recently, UCL repair (UCL-r), depending on the tissue quality and tear configuration. For those requiring reconstruction, emergence of UCL reconstruction with internal brace suture tape augmentation (UCL-IB) offers immediate improvement in collateral stability (Bernholt et al., 2019), which may protect the graft as it matures. Consequently, there is potential for an accelerated return-to-play (RTP) timeline. This study aims to compare RTP duration between pitchers undergoing UCL-IB and those undergoing traditional UCL-R. The hypothesis is that pitchers undergoing UCL-IB will have a faster RTP timeline compared to the UCL-R cohort.

Methods

A retrospective cohort study will be conducted involving baseball pitchers who underwent surgical intervention for UCL tears between January 1st, 2022 and January 1st, 2025. The pitchers will be divided into two cohorts: those who received UCL-R and those who underwent UCL-IB. The primary assessment will be the duration of RTP, which will be determined by the date of surgery to first game appearance. Re-tear/revision rate (RRR) will also be assessed for both cohorts. All tests are to be two-tailed, and statistical significance will be set at $p < 0.05$. To assess for a statistically significant difference between the two cohorts, the continuous variable (RTP) will be compared using Mann-Whitney U tests, while the binary variable (RRR) will be assessed using Fisher's Exact Test.

Results

Work in progress

Conclusions

Work in progress

110. Orofacial Changes in Sickle Cell Anemia: A Literature Review

- Presenting Author: Tyesha Younger (Roseman University)

Additional Author:

- V. Joseph Cheever (Roseman University)

Purpose

The objective of this literature review was to determine if there are changes in the orofacial characteristics of those with sickle cell anemia.

Methods

A comprehensive literature search was conducted across the various electronic databases including PubMed, Roseman University Library online database, and Google Scholar. The article selection process began with a search of the electronic databases using the key words: “Orofacial AND Sickle Cell Anemia”, “Orofacial manifestation AND Sickle Cell Anemia”, “Orofacial characteristics AND Sickle Cell Anemia”. The following inclusion and exclusion criteria were used to determine eligibility of each article for inclusion in this literature review.
Inclusion Criteria: human clinical studies, including clinical trials, cohort studies, case-control studies, case series, case reports, review articles, literature reviews, and systematic reviews, and articles focusing on orofacial manifestations and/or characteristics found to be associated with sickle cell anemia. Exclusion Criteria: articles that were not peer reviewed, publications written in a language other than English, and articles that did not focus on sickle cell anemia.

Results

The most common orofacial manifestations of SCA discovered in this literature review were pallor of the oral mucosa, jaundice of the oral mucosa, atrophy of the tongue papillae, mental nerve neuropathy, orofacial pain, decrease in bone radiodensities, “ladder-shaped” trabecular bone, loss of bone trabeculae, distended medullary spaces, formation of large bone marrow spaces, class II skeletal malocclusion, maxillary protrusion, constricted arches, enlargement of the maxilla, depression of the nasal bridge, maxillary sinus opacification, mandibular osteomyelitis, developmental enamel hypomineralization, hypoplasia, increased overjet, deep overbite, incisal crowding, open bite, posterior open bite, and intrinsic tooth opacity, and delayed tooth eruption.

Conclusions

Work in progress

111. Thymoquinone and Wound Healing: A Meta-Analysis of Experimental and Preclinical Evidence

- Presenting Author: Maariya Syed (Touro University)

Additional Author:

- Basma Salem (Touro University)
- Mobeen Syed (University of Houston)
- Omar Salem (Touro University)
- Saamiya Syed (Pullman Regional Hospital Interventional Pain Management, Foot & Ankle Clinic)
- Jessica Ruggieri (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

Wound healing has four basic stages: hemostasis and coagulation, inflammation, proliferation, and tissue remodeling. The type of wound and factors such as age, vascular insufficiency, and nutritional status can prolong the complex process of wound healing. Nigella sativa, or black seed oil, has been used for centuries for various medicinal applications and has a broad spectrum of pharmacological potential. Studies have shown that bioactive constituents of black seeds, such as thymoquinone (TQ), possess remarkable therapeutic effects. TQ has been shown to accelerate wound healing by increasing fibroblast proliferation, collagen synthesis, promoting re-epithelization, and accelerating wound contraction. It also possesses broad-spectrum anti-microbial, anti-inflammatory, anti-oxidant, and anti-tumor properties.

Methods

This review aims to assess the efficacy of topical N. sativa's properties on wound healing by conducting a literature review. Studies will be collected at a later date by a screening process that will assess quality as well as determine if inclusion criteria is properly met. PubMed, Scopus, and ScienceDirect searches will include the terms "Nigella sativa," "wound healing," "chronic wounds," "diabetic ulcers," "burn wounds," "epithelial," and "inflammation." Studies will not be limited by year of publication due to the limited research conducted regarding this subject. Preliminary findings will be summarized and presented in the poster.

Results

Results have not been acquired at this time. The literature search is to be conducted in mid-February 2026.

Conclusions

Our aim is that the results from this review will inform and encourage further research of TQ as a potential compound of interest in wound healing medicine. These findings may pave the way for TQ applications in future clinical settings.

112. Appropriate initiation and usage of Meropenem and Vaborbactam, Ceftazidime and Avibactam, and Ceftolozane and Tazobactam

- Presenting Author: Marcelo Garcia (MountainView Hospital)

Additional Author:

- Ivy Yang (MountainView Hospital)
- Pavlin Dimitrov (MountainView Hospital Pharmacy Residency program PGY-1)

Purpose

: The use of novel cephalosporins/carbapenems with beta-lactamase inhibitors such as ceftazidime/avibactam, meropenem and vaborbactam, and ceftolozane/tazobactam has been on the rise due to increasing rates of antimicrobial resistance. These organisms include multidrug-resistant Pseudomonas and carbapenem-resistant Enterobacteriaceae producing either KPC or OXA-48. These resistance mechanisms typically function by hydrolyzing β-lactam antibiotics or altering penicillin-binding proteins. This leads to many antimicrobial therapies becoming ineffective. With these agents being reserved as last-line options, it is crucial to ensure they are used appropriately to preserve effectiveness and prevent further resistance development. The goal of this quality improvement project is to evaluate whether escalation or initiation of these restricted antibiotics is appropriate based on available risk factors and culture data, and to assess overall utilization trends to determine if there is a need for a standardized prescribing protocol.

Methods

This is a retrospective chart review of patients who were admitted to a tertiary medical center from January 2021 to November 2025. Data collected through Meditech and Innovolan. Meditech is an electronic health record (EHR) system, while Innovolan is a clinical surveillance platform that monitors data from the EHR to help identify opportunities for clinical intervention. The primary outcome explores the appropriateness for escalation or initiation of any of these antibiotics based on culture growth or previous history of multi-drug-resistant organisms (MDRO) within the past six months. Secondary outcomes include length of hospital stay, time spent in the intensive care unit (ICU), duration of therapy, days till escalation, inflammatory markers on the day of escalation, and mortality. Inclusion criteria include at least more than one administration of any of the three antibiotics during hospital stay, 18 years or older, and no allergies to any of the three antibiotics. Exclusion criteria include known allergies to any of the three antibiotics, or only a single admission of any of the three antibiotics.

Results

TBD

Conclusions

TBD

139. Turner Syndrome: Dental and Orthodontic Treatment Modifications

- Presenting Author: Charles H Pitts (Roseman University)

Additional Author:

- V. Joseph Cheever (Roseman University)

Abstract

Turner Syndrome (TS) is a chromosomal disorder affecting approximately 1 in 2,500 live female births and is characterized by partial or complete monosomy X. Although its systemic manifestations span multiple medical disciplines, its dental and craniofacial implications are of particular importance to orthodontic care. Patients with TS frequently present with distinctive dentofacial characteristics, including malocclusion, increased overjet and overbite, altered occlusal morphology, and anomalies in tooth size and shape. In addition, emerging evidence suggests unique craniofacial growth patterns and developmental trajectories in individuals with TS, often influenced by associated growth hormone deficiency. These variations have significant implications for diagnosis, treatment planning, and the timing of orthodontic intervention. This literature review synthesizes current evidence regarding the dental and orthodontic features of Turner Syndrome, emphasizing clinical considerations necessary to optimize patient care. By consolidating existing knowledge, this review aims to support orthodontic professionals in delivering individualized, comprehensive, and evidence-based treatment to patients with TS.

Public Health

113. Emergence of Black Henna: Digital Epidemiology Reveals Global Surge and Dermatologic Risk

- Presenting Author: Stephanie Elefson (Roseman University)

Additional Author:

- Mojan Deriss (Roseman University)
- Voicu Ciobanu (Roseman University)

Purpose

The growing use of black henna products adulterated with para-phenylenediamine (PPD) has heightened concern about severe, preventable dermatologic reactions, particularly in individuals with skin of color. Despite high-profile social media cases that have amplified global awareness, systematically collected epidemiologic data on exposure and harm remain limited. This study aims to quantify temporal trends in public interest in 'black henna' and relate these patterns to reported complications in clinical practice to inform surveillance and prevention efforts.

Methods

A retrospective digital epidemiology study was conducted using Google Trends. United States and worldwide search interest for 'black henna' was extracted from December 2020 to December 2025, and the search volume index (SVI) was normalized on a 0–100 scale. A focused literature review and clinical vignettes informed characterization of dermatologic sequelae.

Results

Over the past five years, search interest in 'black henna' remained relatively stable until mid-November 2025, when a marked spike was observed, with SVI reaching 100, the highest recorded popularity. This surge temporally coincided with widespread social media attention to an influencer's facial scarring after black henna application. Literature review and clinic cases demonstrate severe allergic contact dermatitis, keloid formation, and post-inflammatory hyperpigmentation (PIH), disproportionately affecting individuals with Fitzpatrick skin types IV–VI.

Conclusions

Digital epidemiology via Google Trends reveals a recent global peak in 'black henna' interest that parallels increases in clinically significant dermatologic complications in at-risk populations. Incorporating search analytics into surveillance frameworks may provide early warning of hazardous exposure trends and support targeted education and regulatory interventions. The novelty of this work lies in integrating digital surveillance with clinical data in the context of black henna, offering a scalable model for dermatologic public health response to emerging cosmetic practices.

114. Comparison between Liraglutide and Semaglutide as GLP-1 Receptor Agonists for Obesity in Adolescence, A Literature Review

- Presenting Author: Tae Hyung Kang (Roseman University)

Purpose

The purpose of this study is to review and compare the effectiveness and safety of Liraglutide and Semaglutide as GLP-1 receptor agonists for obesity in adolescence.

Methods

Since the GLP-1RA is a recent findings for obesity, literature published from 2020 were searched. This study focuses on children and adolescence between age of 12 and 18 who were treated with either liraglutide or semaglutide. Some of the exclusion criteria were studies involving patients older than 18 years, studies testing obesity medication that is not FDA approved, and studies not done in English

Results

Both liraglutide and semaglutide showed better effectiveness over placebo in reducing BMI and body weight. Semaglutide showed better effectiveness and superior safety over liraglutide.

Conclusions

Work in progress

115. Organizational Characteristics Associated with Addressing Community Social Determinants of Health in U.S. Hospitals: A National Perspective

- Presenting Author: Kimberly Jones-Rudolph (Roseman University)

Additional Author:

- Wilfredo Lacro (University of Nevada, Las Vegas)
- Larry Hurst (University of Nevada, Las Vegas)
- Jay Shen (University of Nevada, Las Vegas)

Purpose

With so much emphasis currently on Social Determinants of Health (SDOH), we examined the characteristics of U.S. hospitals making commitments to SDOH and engagement with community social determinant programs and activities (CSDPAs).

Methods

This cross-sectional study used the 2021 American Hospital Association (AHA) Annual Survey with a total of 5992 hospitals included. The dependent variables were the community social determinants composite score, community partnership composite score, and the use of CSPDAs to assess outcomes.

Results

Hospitals most influenced by payment policies and regulations were most likely to engage in CSDPAs. Hospitals with ACOs implement 3.38 more CSPDAs and hospitals participating in bundled payments are 41% more likely to address SDOH (OR = 1.41, 95% CI = [1.14, 1.75]). Hospitals in competitive markets and hospitals with ≥400 beds are positively associated with both SDOH activities and partnerships. Teaching hospitals, not-for-profit hospitals, Medicare mix, and rural hospitals, as well as market competition, were positively associated with higher levels of CSDPAs.

Conclusions

Reimbursement requirements, organizational size and resources, and external pressures were shown as drivers for hospitals to implement CSDPAs.

116. Examining the Association Between Depression and Dental Caries in Low-Income Populations

- Presenting Author: Haripriya Nalluri (Roseman University)

Additional Author:

- Amir Mohajeri (Roseman University)
- Anum Sameer (Roseman University)
- Man Hung (Roseman University)

Purpose

The purpose of this study was to examine the association between depression, income and caries rate among U.S. adults using nationally representative data.

Methods

A cross-sectional analysis of nationally representative NHANES data was conducted to examine associations between depressive symptoms and eight oral health outcomes among U.S. adults. Regression models with multiple imputation were used to estimate adjusted associations controlling for sociodemographic, health, and behavioral covariates.

Results

Initially, both depression and low income were associated with higher odds of dental caries, but the association with depression disappeared after adjusting for health behaviors and other factors.

Low income remained a consistent and independent predictor of increased caries risk across all models, with no evidence that depression amplified or changed this relationship.

Conclusions

Although both depression and low income were initially associated with higher rates of untreated dental caries, only low income remained a significant predictor after accounting for demographics, health conditions, and behaviors.

These findings indicate that socioeconomic factors—particularly access to care and financial barriers—play a stronger and more consistent role in caries risk than depression, whose effects appear to operate indirectly through associated health behaviors.

117. Who Is Shaping Nicotine Messaging on TikTok? An Analysis of Content Creators, Tone, and Audience Response

- Presenting Author: Alexis Desany (Touro University)

Additional Author:

- Amanda McCarty- Scalmanini (Touro University)
- Holly Griffith (Touro University)
- Karolin Markarian (Touro University)
- Nikoleta Vasileva (Touro University)
- Sherli Koshy-Chenthittayil (Touro University)

Purpose

The media has been shaping public perception of nicotine use for decades. From Joe Camel to the Centers for Disease Control and Prevention's "Tips From Former Smokers," young consumers have been a large target. The rise of TikTok and influencers has given Gen Z users access to a broad spectrum of information about nicotine use. This project explores the current information shared on TikTok about three different nicotine products-Zyns, vapes, and cigarettes.

Methods

Seventy-five TikTok videos (25 per nicotine product) were collected based on the number of likes, to capture content with the greatest audience engagement. Each video was analyzed for creator type (influencer, health professional, or general user), tone (positive, negative, or neutral) and audience response to evaluate patterns in nicotine-related messaging on TikTok.

Results

This study highlights TikTok as a major platform for nicotine-related content, with messaging dominated by influencers and general users rather than health professionals. Vaping-related content generated the greatest engagement, averaging 32.9 million views per video, though it was framed negatively. While Zyn-related content demonstrated lower visibility and a slightly negative tone, but the audience response was supportive of the product.

Conclusions

By understanding the messages reaching the general public, and the creators propagating the information, we can determine TikTok's effect on the health behaviors of young social media users. TikTok plays a significant role in shaping young audiences' perceptions of nicotine products, yet health professionals are largely absent from social media conversation. The prevalence of influencer-driven content raises concerns about misinformation and its impact on youth health behaviors.

118. Changes in Healthcare Access Among Individuals in the Unhoused Population Following Detoxification and Housing Programs: A Retrospective Cohort Study

- Presenting Author: Jacob Rounkles (Roseman University)

Additional Author:

- Jake Hobson (Roseman University)
- Jason Khoury (Roseman University)
- Ghaleb Al-Owir (Roseman University)
- Salma Nassar (Roseman University)
- Liam Clarke (Roseman University)
- Eshaan Mehra (Roseman University)
- Daniel Moses (Roseman University)

Purpose

Individuals experiencing homelessness face substantial barriers to healthcare access driven by upstream social determinants of health, including housing instability, lack of insurance, and substance use disorders. While housing and detoxification programs have each been linked to changes in healthcare utilization, the effect of sequential participation in both interventions on longitudinal access remains unclear. This study aims to retrospectively evaluate changes in healthcare access among adults experiencing homelessness following completion of detoxification and subsequent housing placement, with attention to insurance status, patient-reported barriers, and continuity of care over time.

Methods

Methods:
We will conduct a retrospective longitudinal cohort study using linked administrative and clinical datasets from detoxification, housing, and healthcare systems. Adults experiencing homelessness who completed a structured detoxification program followed by housing placement will be included. Outcomes will be assessed at four predefined timepoints: pre-detoxification (T0), post-detoxification/pre-housing (T1), early post-housing (3–6 months; T2), and sustained housing (12 months; T3). Primary outcomes include healthcare access across structural (insurance coverage, primary care assignment), functional (completed primary care visits, preventive service utilization), and experiential (patient-reported barriers to care) domains. Multivariable regression analyses will adjust for key clinical and social confounders, including mental health diagnoses, substance use severity, chronic disease burden, duration of homelessness, and demographic characteristics.

Results

Results (Anticipated):
We anticipate that housing placement following detoxification will be associated with significant improvements in insurance coverage, primary care engagement, and reductions

in patient-reported barriers to care. We further hypothesize that these improvements will be most pronounced among individuals achieving sustained housing and will persist after adjustment for baseline clinical and social vulnerability.

Conclusions

Research not yet conducted

119. Dermatology Residency Programs and Skin Cancer Outcomes: A Multi-State Ecological Analysis of Training Capacity, Stage at Diagnosis, and Mortality

- Presenting Author: Brian Park (Roseman University)

Additional Author:

- Mojan Deriss (Roseman University)
- Stephanie Elefson (Roseman University)
- Apurva Pendse (Roseman University)
- Danielle Ambrosio (Roseman University)
- Pimthada Bubphamala (Roseman University)
- Gordon Burns (Roseman University)
- Sarah Bovenberg (Las Vegas Dermatology)

Purpose

Skin cancer is the most common malignancy in the United States, and earlier detection of melanoma is strongly associated with reduced metastasis and mortality. Prior studies show that targeted dermatologic education improves diagnostic proficiency and increases detection of early-stage lesions, but no study has systematically evaluated whether regions with dermatology residency programs achieve better population-level skin cancer outcomes compared to regions without such programs. Understanding this relationship could inform workforce planning, residency program distribution, and public health strategies aimed at reducing skin cancer burden.

Methods

This ecological study will link US state-level melanoma and non-melanoma skin cancer data (incidence, stage at diagnosis, Breslow thickness distribution, and cancer-specific mortality) with data on the presence, number, and size of ACGME-accredited dermatology residency programs. Covariates will include demographic structure, ultraviolet (UV) index, insurance coverage, primary care physician density, urban–rural mix, and socioeconomic indicators. Multivariable regression models and spatial analyses will estimate associations between dermatology residency program density and: (1) proportion of in situ vs invasive melanoma, (2) median Breslow thickness, (3) melanoma-specific mortality, and (4) available process measures such as time to definitive excision.

Conclusions

The primary hypothesis is that states with at least one dermatology residency program, and higher dermatology residency position density per capita, will demonstrate earlier-stage melanoma at diagnosis (higher proportion in situ, lower median Breslow thickness) and lower melanoma-specific mortality than states without residency programs, after adjustment for confounders. Secondary hypotheses are that residency presence will be associated with process indicators consistent with improved care, such as shorter time to definitive treatment (i.e., excision, chemotherapy, radiation) reflecting the impact of

academic dermatology infrastructure on access, diagnostic vigilance, and procedural expertise.

120. Las Vegas, Nevada: A Case Study for Persistent Health Inequities Rooted in Historical and Structural Racism

- Presenting Author: Sarah Blank (University of Nevada, Las Vegas)

Additional Author:

- Liahm Blank (University of Nevada, Las Vegas)
- Juliano El-Hajj (University of Nevada, Las Vegas)
- Jennifer El-Hajj (University of Nevada, Las Vegas)
- Jennifer Young (University of Nevada, Las Vegas)

Purpose

Structural racism entrenches neighborhood health inequities by modifying residents' lived environment. Las Vegas, Nevada—one of America's fastest-growing yet historically segregated cities—offers a stark contemporary case of the longstanding health effects resulting from alienation of African Americans to the borders of society. This cross-sectional ecological study examined whether racial composition predicts health variation across 39 ZIP codes in the greater Las Vegas metropolitan area after accounting for income.

Methods

We used ZIP-code-level demographic data from HealthySouthernNevada.org to create a race-contrast variable (ΔRace = % African American – % White) and regressed 24 chronic-disease, mental-health, hospitalization, and mortality outcomes on ΔRace and median household income (per $10,000), controlling the false-discovery rate at $\alpha = 0.05$.

Results

Each ten-percentage-point shift toward an African-American majority was associated with a 1.3-percentage-point increase in insufficient sleep and a 0.9-percentage-point increase in residents reporting at least 14 poor-mental-health days per month; obesity prevalence rose 0.8 points, hypertension hospitalizations 1.2 points, and heart-failure hospitalizations 3.8 points. Conversely, preventive-care markers—including cholesterol screening and antihypertensive medication use—were more common in White-majority areas. Notably, life-expectancy gaps disappeared once income was included in the regression, underscoring the dominant role of economic resources in longevity, yet not in day-to-day morbidity.

Conclusions

These findings suggest that policy solutions cannot rely solely on economic revitalization; rather, they must also dismantle place-based structural barriers, such as residential segregation, environmental stressors, and unequal service distribution, to close Las Vegas's racial health gaps and advance equity.

121. Evaluating TikTok as a Source of Dietary Information for Inflammatory Bowel Disease: A Preliminary Study

- Presenting Author: Abdullah Sattar (Touro University)

Additional Author:

- Harshita Sarambale (Touro University)
- Nicholas Seto (Touro University)
- Rayyan Mateen (Touro University)
- Marianna Petrosyan (Touro University)
- Sabah Islam (Touro University)
- Sherli Koshy Chenthittayil (Touro University)

Purpose

TikTok is undoubtedly one of the most widely used social media platforms made popular by its short-form content. As a result, individuals can use TikTok as a resource to learn about and understand their medical conditions. Content about inflammatory bowel disease (IBD)is abundant yet the credibility and reliability of this content remain unclear. This study aims to evaluate the educational credibility and reliability of IBD content on TikTok.

Methods

The full study will analyze 150 videos with 50 searches of "IBD diet," "Crohn's disease diet," and "Ulcerative colitis diet." Engagement metrics, video content, user's profession and demographics will be collected. The educational content of the videos will be analyzed utilizing a modified DISCERN(mDISCERN) criteria tool. American College of Gastroenterology (ACG) guidelines were used to determine reliability of the diet recommendations.

Results

A preliminary sample of 15 videos was analyzed with 5 videos from each search category, however four videos were excluded as two were duplicates and two were irrelevant to IBD (n = 11). Of these, zero videos were posted by a physician and only one was posted by a non-physician healthcare professional. Rather, 90.9% of the users were personally diagnosed with IBD. Moreover, zero videos cited official society guidelines and the remaining videos cited only personal experience. In terms of video type, 72.7% were testimonials and one was an advertisement for a holistic treatment protocol. For diet recommendations, 81.8% recommended a low FODMAP diet, 15.4% recommended a Mediterranean diet. The average mDISCERN score for all videos was 8.64, emphasizing decreased integrity of the information presented. The most popular video (184100 views) was a testimonial video where the user had IBD and recommended a low FODMAP and gluten free diet. No sources were cited and the mDISCERN score was 9. ACG guidelines recommend Mediterranean diets and Specific Carbohydrate diets which only aligns with a concerningly small proportion of videos.

Conclusions

As more individuals turn to social media for educational purposes, it is vital for users to learn how to assess video credibility and important to encourage qualified professionals to use new avenues of medical knowledge dissemination.

122. Impact of Digital Screen Use on Ocular Health

- Presenting Author: Rhea Govindaraj (Coronado High School)

Additional Author:

- Manas Mandal (Roseman University)

Purpose

Adolescent screen use leading to digital eye strain and long-term ocular health is a growing concern. Digital eye strain is characterized by eye fatigue, dryness, headaches, and blurred vision. The effectiveness and accessibility of common preventive strategies remain unclear. Our research examines three key areas to understand the impact of digital screen use on ocular health in adolescents, 1) the relationship between prolonged screen time and digital eye strain, 2) the effectiveness of blue light-filtering glasses in reducing eye strain symptoms, and 3) awareness of and access to blue light-filtering interventions as a preventive tool.

Methods

A key word-based literature search was conducted utilizing MeSH terms accessible databases such as PubMed, Scopus, and Google Scholar that derived peer-reviewed studies from ophthalmology, optometry, adolescent health, and social science journals. Selected articles were analyzed comparatively to identify consistent findings and contradictions in existing research related to adolescent screen use and eye health.

Results

The literature review suggests that excessive screen exposure is associated with increased visual discomfort, eye fatigue, and attentional strain. Although moderate screen use is not consistently shown to be harmful to eyes. Evidence regarding the effectiveness of blue light-filtering glasses is mixed. Several studies report objective improvements in visual performance and accommodative accuracy, while others demonstrate minimal subjective symptom relief and inconclusive long-term benefits. Additionally, social and socioeconomic factors including perceived stigma and misinformation significantly influence adolescents' willingness to adopt protective eyewear to reduce the harm.

Conclusions

Our findings suggest that education and accessibility may play a more significant role in reducing digital eye strain among adolescents than reliance on commercial blue light-filtering products alone. This study highlights the importance of evidence-based digital eye health education and identifies gaps in current research, particularly regarding long-term outcomes and adolescent-specific interventions. Addressing these gaps may provide more effective and equitable prevention strategies for digital eye strain in youth.

123. Understanding Observed Returns to Unsheltered Living Among Unhoused Individuals in a Rapid Outreach and Placement Model in Las Vegas

- Presenting Author: Salma Nassar (Roseman University)

Additional Author:

- Jacob Rounkles (Roseman University)
- Jake Hobson (Roseman University)
- Sophia Asif (Roseman University)
- Eshaan Mehra (Roseman University)
- Jason Khoury (Roseman University)
- Ghaleb Al-Owir (Roseman University)
- Liam Clarke (Roseman University)
- Daniel Moses (Roseman University)

Purpose

Unhoused individuals between 18-65 years old in Las Vegas face persistent barriers to sustaining exits from unsheltered living, often cycling between temporary placements and returning to unsafe environments. Rapid outreach and placement programs that emphasize immediate access to housing, treatment, and case management aim to reduce this cycling; however, returns to unsheltered settings during or after placement are frequently observed. While returning to unsheltered living (recidivism) is well recognized in practice, limited evidence exists regarding how patterns of observed return vary by early program engagement, placement type, and initial living environment within real-world community-based outreach models. The objective is to examine patterns of observed return to unsheltered living among unhoused adults engaged in a rapid outreach and placement program in Las Vegas, and to identify individual- and program-level factors associated with sustained housing or shelter stability during program observation.

Methods

We will conduct a cohort study using administrative and case management data from Shine A Light's Instant Placement with Access to Treatment and Housing (IPATH) program, incorporating both retrospectively available records and prospectively documented information collected during routine outreach and case management activities.
Unhoused adults engaged through outreach activities who subsequently receive placement into housing and/or treatment will be included. Initial living environment, including underground flood channels or other unsheltered locations, will be recorded as a baseline characteristic rather than an inclusion criterion.
The primary outcome will be observed recidivism to unsheltered living, defined as any documented return to unsheltered environments or re-engagement by outreach teams in unsheltered locations following placement, as captured in routine program records. Individuals will be observed from the time of placement until the last documented program

or outreach contact, with observation duration varying by individual.
Baseline covariates will include demographic characteristics, duration of unsheltered status prior to engagement, initial living environment, and placement type. Program-level covariates will include intensity of case management contact during the first 90 days following placement and continuity of engagement as documented in case notes.
Analyses will be descriptive and comparative. Multivariable logistic regression models will be used to examine associations between baseline and program-level factors and the likelihood of observed recidivism. Results will be reported as adjusted odds ratios with 95% confidence intervals, representing associations with documented return to unsheltered living.

Results

N/A - work in progress

Conclusions

N/A - work in progress

124. Prevalence of Stigmatizing Language in Primary Care Medical Records

- Presenting Author: Jasmine Dhillon (Roseman University)

Additional Author:

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Purpose

Clinicians often rely on electronic health record (EHR) documentation to form initial impressions of patients, yet the presence of biased terminology can compromise the quality of care and the patient-provider bond. This investigation sought to quantify the frequency of biased descriptors within primary care documentation and determine which specific patient demographics or medical histories are most frequently associated with such language.

Methods

This retrospective analysis focused on a cohort of adults (ages 50 and older) treated within a Southern California health network from 2018 through 2023. Researchers utilized natural language processing technology, grounded in established linguistic frameworks, to scan free-text entries from both routine physical and recent follow-up appointments. Statistical modeling via generalized estimating equations identified the relationship between patient characteristics and the likelihood of encountering prejudiced documentation.

Results

The study cohort comprised 34,563 patients and 50,211 clinical notes, with stigmatizing language (SL) identified in 36.7% of patients and 30.0% of all notes. Multivariate modeling demonstrated that increased odds of SL were associated with advanced age (OR 1.01), male sex (OR 1.11), and Black race (OR 1.30). Socioeconomic factors were also significant, including residence in the most disadvantaged neighborhoods (OR 1.32) and coverage by

Medicare (OR 1.64) or Medicaid (OR 1.63). Regarding clinical comorbidities, higher odds were observed for patients with diabetes (OR 1.67), obesity (OR 1.27), and chronic pain (OR 1.18). Conversely, lower odds of SL were linked to being uninsured (OR 0.55) or having a cancer diagnosis (OR 0.87).

Conclusions

Subjective and potentially harmful language is a widespread issue in primary care, particularly impacting marginalized groups and those with stigmatized chronic illnesses. Because these notes are now readily viewable by patients under federal law, the high prevalence of such language necessitates a systematic shift in how clinicians document care. These results emphasize the urgency of implementing training programs designed to eliminate implicit bias in medical writing.

125. Scrolling Instead of Consulting: TikTok's Role in Eroding Trust in Physicians

- Presenting Author: Tiffany Ng (Touro University)

Additional Author:

- Connor Dorais (Touro University)
- Carmen Ma (Touro University)
- Julia Reitkopp (Touro University)
- Harshita Sarambale (Touro University)
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Purpose

A patient's trust in their physician is essential in establishing a patient-physician relationship that provides effective care. Recently, this trust has significantly declined, with social media playing a central role. In particular, TikTok's short-form, algorithm-driven content allows for rapid sharing of personal experiences, commentary, and possible misinformation, making it a prime medium for propagating this distrust. This study investigates TikTok's role as a vehicle for spreading physician mistrust.

Methods

Fifty videos each were collected from searches "doctor mistrust," "physician misinformation," and "never trust doctors." Preliminary analysis of the videos involved a reviewer observing engagement metrics, the creator's profile, thematic content, tone, resources cited, and informational quality using a modified DISCERN scoring tool (0-5). The full study will include two reviewers per video.

Results

The majority of analyzed videos (55%) had a critical tone towards physicians. 42% of videos were posted by physicians or healthcare professionals. The majority of videos (53%) were anecdotal posts, often expressing anger (27%), fear (4%), and sadness (4%). Common themes included misdiagnosis (20%), racism (4%), and sexism (2%). 22% of videos explicitly asked viewers to not trust physicians. When analyzing the credibility of the videos, only 4% cited external sources. The average DISCERN score was 3, indicating low-quality or unverified information. The most-viewed video, with 1200000 views, described a prolonged misdiagnosis experience, was posted by a non-physician, and generated high engagement despite a low DISCERN score of 2. Work in progress.

Conclusions

Preliminary findings indicate that TikTok serves as a vehicle for physician mistrust through three mechanisms: algorithmic amplification of emotional narratives, dominance of anecdotal over evidence-based content, and low rates of credible source citation. TikTok's algorithm prioritizes videos with strong emotional appeal, increasing their visibility

regardless of accuracy. With most videos also originating from non-physicians or lacking verifiable references, viewers are exposed to disproportionately high volumes of personal negative experiences over factual medical explanations. This highlights an important implication: public perception of healthcare on TikTok is shaped by emotional resonance and storytelling rather than medical accuracy. Moving forward, healthcare professionals could engage on social media to present credible information, address mistrust, and counterbalance misleading narratives. Work in progress.

126. A Gender-agnostic Inclusive Estimation for Resting Metabolic Rate

- Presenting Author: Matahn Blank (Roseman University)

Additional Author:

- Dustin Davis (University of Nevada, Las Vegas)
- Michael Wong (University of Nevada, Las Vegas)
- Olivia Perez (University of Nevada, Las Vegas)
- Carolina Silva (University of Nevada, Las Vegas)
- James Navalta (University of Nevada, Las Vegas)

Purpose

Resting metabolic rate (RMR) is widely used to estimate energy needs in health, clinical, and performance settings. Existing RMR prediction equations rely on binary sex classifications, which may reduce accuracy for some individuals within the male/female binary and exclude those who are non-binary or gender diverse. To ensure RMR estimates are both accurate and inclusive, there is a need for gender-agnostic prediction models. The purpose of this study was to generate data to derive an inclusive equation for estimating RMR without reference to sex or gender.

Methods

Ninety-four adults participated (cisgender female n = 47, cisgender male n = 41, gender diverse n = 6). Participants reported to the laboratory between 0700 and 0830 after following standardized pre-test instructions. Height, body mass, waist and hip circumference, and resting heart rate were measured. RMR was assessed via indirect calorimetry, using the lowest continuous 5-minute VO_2 value obtained during a 15-minute measurement period. Stepwise multiple regression was used to derive a prediction equation from candidate variables including age, anthropometrics, and resting heart rate. Agreement between measured and predicted RMR was assessed using paired comparisons and Bland–Altman analysis.

Results

The final model included height, body mass, and resting heart rate. The model demonstrated a correlation coefficient (R) of 0.784, an R^2 of 0.614, and a standard error of the estimate of 207.32 kcal/day. The resulting gender-agnostic equation is: RMR (kcal/day) = 14.708 × height (cm) + 10.421 × mass (kg) + 6.211 × resting heart rate − 2019.411. The equation demonstrated minimal bias (0.03 kcal/day) and acceptable limits of agreement when compared with measured RMR. Several existing prediction equations significantly over- or underestimated RMR in this sample.

Conclusions

This study presents the first RMR prediction equation derived from a sample that includes individuals who do not identify exclusively as cisgender female or cisgender male. The resulting gender-agnostic equation provides an inclusive and practical method for

estimating energy requirements and may improve accuracy in applications such as daily energy balance calculations, dietary planning, and clinical risk assessment.

138. The Role of Emergency Department–Initiated Buprenorphine and Its Association With Emergency Department Revisitation Patterns: Implications for Value-Based Care

- Presenting Author: Jasjeet Kaur (Roseman University)

Additional Author:

- Inessa Sevantsian (Roseman University)
- Sara Hernandez Blanco (Roseman University)
- Farhad Kamyar (Roseman University)

Purpose

Emergency departments serve as a critical access point for patients with opioid use disorder (OUD), with over 1.1 million opioid-related ED visits occurring annually in the United States.[1-2] ED-initiated buprenorphine has demonstrated efficacy in improving treatment engagement, with randomized trials showing 78% of patients engaging in OUD treatment within 30 days compared to standard referral.[1] However, real-world adoption varies considerably, and the relationship between ED-initiated buprenorphine and subsequent healthcare utilization patterns remains incompletely characterized.[2] Understanding whether ED-initiated buprenorphine is associated with changes in ED revisitation may inform value-based care strategies focused on reducing avoidable healthcare utilization while improving patient outcomes.

Methods

This retrospective cohort study will utilize electronic health record data from hospital based institutions across Southern Nevada to identify adult patients with OUD-related ED visits. The exposure of interest will be receipt of ED-initiated buprenorphine (defined as buprenorphine administration in the ED and/or prescription at discharge). The primary outcome will be 30-day and 90-day ED revisitation rates for any cause. Secondary outcomes will include opioid-related ED revisits, time to first ED revisit, and engagement in outpatient OUD treatment within 30 days. We will employ models to estimate the association between ED-initiated buprenorphine and time to ED revisit, adjusting for patient demographics, insurance status, comorbid mental health conditions, substance use patterns, and prior healthcare utilization as able.[3-4] Subgroup analyses will examine whether associations differ by clinical presentation (overdose, withdrawal, other OUD-related conditions).[5]

Conclusions

Hypothesis: We hypothesize that patients receiving ED-initiated buprenorphine will demonstrate lower rates of ED revisitation at 30 and 90 days compared to patients who do not receive ED-initiated buprenorphine, mediated through improved engagement in outpatient OUD treatment and reduced opioid-related complications.

Scholarship of Teaching and Learning (SOTL)

127. Evaluating LLM-Generated Summaries and Flashcards in PharmD Education: Student Perceptions and BERTScore Reliability Testing

- Presenting Author: Jenny Kim (Roseman University)

Additional Author:

- Judy Le (Roseman University)
- Ryan Lister (Roseman University)
- Arup Chakraborty (Roseman University)

Purpose

In accelerated pharmacy programs, clear and concise summaries of lecture material can aid learning. However, student-made notes may risk misinterpretation of class content. While large language models (LLMs) can be useful for generating slide summaries and flashcards, inconsistent outputs may raise reliability concerns. This study focuses on student perceptions of LLM-produced slide summaries and evaluates reliability across different models using automated semantic similarity metrics (e.g., BERTScore). We examined whether student preferences change with content complexity, and whether automated benchmarks can help identify which LLM produces the most reliable study materials that stay true to the original content.

Methods

The study employed a two-phase design:

In Phase 1 (Student Evaluation), first-year PharmD students reviewed summaries of two lecture slides—one simple (abacavir drug information) and one more complex (pharmacogenomics concept)—created by four anonymized but popular LLMs. They used four 5-point Likert scale questions to rate clarity, presentation quality, preference compared to the original slides, and confidence in explaining the topic. Thirty-seven students evaluated the abacavir outputs, and thirty-six assessed the pharmacogenomics outputs. The analysis involved Friedman tests and Wilcoxon signed-rank pairwise comparisons with Holm adjustment.

Phase 2 (BERTScore Evaluation): The four LLMs generated both summaries and flashcards for five different slides. Each output was compared to instructor reference content using BERTScore metrics (precision, recall, and F1), providing objective similarity measures to address reliability concerns and enable cross-model performance comparisons.

Results

Straightforward Content (Drug Information of Abacavir): No statistically significant differences emerged among LLMs ($p \geq .095$). Average ratings were slightly higher for Deepseek ($M=3.82$) and Gemini ($M=3.76$), followed by Claude ($M=3.67$) and ChatGPT ($M=3.36$), indicating comparable performance across models for straightforward material.

Complex Content (Concept of Pharmacogenomics): Significant differences appeared across all evaluation criteria (χ^2=9.5–11.8, p=0.008–0.023). Students rated Claude (M=4.00) and DeepSeek (M=3.88) significantly higher than ChatGPT (M=3.19) for clarity and presentation quality (Holm-adjusted p≤.044). Gemini (M=3.64) performed at an intermediate level. These results demonstrate clear student preferences for Claude and DeepSeek when processing conceptually challenging content. BERTScore Analysis: All models demonstrated reliable content generation that reflected the reference slides (FBERT≈0.75–0.90). Claude often achieved the highest scores (abacavir summary FBERT = 0.897; pharmacogenomics FBERT = 0.880), though differences between models remained small.

Conclusions

This two-phase study shows that while all tested LLMs produced outputs that reflected the original content well according to BERTScore metrics, student preferences varied significantly between models and became more noticeable with complex material. For straightforward content, student ratings remained similar across models, but more challenging material revealed clear preferences for Claude and DeepSeek over ChatGPT and Gemini. Effectively integrating LLMs into pharmacy education requires combining automated benchmarking methods with direct student feedback to ensure both technical accuracy and enhanced learning experiences.

128. TUN's Medical Health and Environmentalism Club and an Educational Resource

- Presenting Author: Temperance Jensen (Touro University)

Additional Author:

- Nicholas Vitiello (Touro University)
- Shilpa Bhat (Touro University)
- Shannon Maloney (Touro University)
- Brad A. Haubrich (Touro University)

Purpose

Pollutants like microplastics cause disease, decrease patient quality-adjusted life years (QALYs), and are causing an unprecedented environmental crisis. While sources of microplastics like water bottles, cooking utensils, and cosmetics may seem obvious, lesser-appreciated sources include synthetic and semi-synthetic textiles. When worn, these textiles leech microplastics into circulation and distribute into every organ of the human body. The degree of leech of microplastics increases with fiber breakdown and with an increased core temperature while wearing these garments, like during exercise.

Methods

To raise awareness and promote personal mitigation strategies, Touro University Nevada's Medical Health and Environmentalism Club (MHEC) has developed a one-hour extracurricular educational resource on the impact of the fashion industry on human and environmental health. Our pilot presentation was a club activity available on campus, with a group of approximately 30 students.

Results

The audience demonstrated engagement, indicated that they did not know about these issues, and were informed on ethical uses of old garments. The course has been piloted on osteopathic medical students, and we are refining content to make it more amenable to younger students, with a goal of 6th - 12th grade students, and we are seeking IRB approval as we expand the project and to add pre- and post- surveys.

Conclusions

Teaching this population will allow for natural dissemination of information to peers and family members. Preliminary reflections of MHEC board members indicate that our short course on the impacts of textiles and the fashion industry is effective among young adults.

129. “RISE Reading for Change”: AltaMed Research, Implementation Science & Evaluation (RISE) Book Club

- Presenting Author: Danielle Ambrosio (Roseman University)

Additional Author:

- Michelle Vu (Roseman University)
- Zuri Inzunza, MPH, CHES, Project Coordinator (AltaMed)
- Monika Scherer, MBA, MPH, CHES, Project Coordinator (AltaMed)
- Adrienne Martinez-Hollingsworth, PhD, RN, PHN, WAN, Director of Research and Evaluation (AltaMed)

Purpose

We created a book club for AltaMed Research, Implementation Science & Evaluation (RISE) members as a creative way to foster discussion around social determinants of health, how it can change our worldview, affect our quality of care, and give members a space to unwind.

Methods

Book Selection Process:
We chose one contemporary nonfiction book for each month based on its strong alignment with the club’s theme in addition to member voting.

Book Club Meeting Process:
With each month devoted to one book, we divided each book into four sections.
Weekly meetings were held virtually for one hour every Thursday at 3pm which allowed members to “wind down” and participate in discussions in a more relaxed manner.

Structure of Book Club Presentations:
The book club was centered around a slideshow presentation with chapter summaries to give members a chance to gain insight on this week’s important topics and themes.
We then allowed members the chance to offer up their initial thoughts before engaging in group discussion with our prepared questions.

Results

Turnout ranged from 4-11 members during each meeting.
About 50% of the members read the assigned chapters before the meeting via audiobook or physical copy.
Inclusion of chapter summary slides made members encouraged to attend despite not reading, and they often connected the book themes to ideas from their own lives including education, research, and clinical practice.
Pertinent themes that were discussed included cultural competency in the use of holistic healthcare, patient advocacy, and barriers to care in marginalized communities.

Conclusions

Members gained new insight on cultural beliefs and the historical events that shaped them through discussion of themes and how they connected to our lived experiences.

This book club has allowed us to think of healthcare in a more holistic manner and helped us foster our sense of patient advocacy, humility, and cultural competency that we hope to utilize as future medical students.

We found that announcing books and pre-selected chapters in advance, holding consistent weekly virtual meetings, and providing chapter summaries allowed members to learn about the books and discuss freely without feeling stressed about keeping up with the content.

130. Beyond the Hype: AI-Generated Videos Show Real Teaching Promise After Student-Informed Refinement

- Presenting Author: Arup Chakraborty (Roseman University)

Purpose

This first study in the series compared how well students learned from AI-generated video instruction versus traditional teaching methods in pharmacy education and identified specific features that needed improvement.

Methods

First-year PharmD students (n=41) who attended all three instructional sessions completed three 15-minute biochemistry lessons using AI-generated video, prerecorded instructor video, and live in-person instruction on separate days. Each lesson was followed by an eight-item multiple-choice quiz. A subset (n=36) completed a baseline assessment before instruction. Students rated each teaching method and provided written feedback. Quiz scores were analyzed using the Friedman test with Wilcoxon signed-rank post hoc comparisons; written feedback was analyzed using thematic analysis.

Results

Quiz scores differed significantly across teaching methods ($p<0.001$). Compared to baseline scores (18%), all methods produced large learning gains: in-person instruction reached 93% (+75 percentage points), prerecorded video reached 85% (+67 percentage points), and AI-generated video reached 68% (+50 percentage points). While AI video scored lower than traditional methods, it still produced meaningful learning gains. Students rated in-person instruction highest for engagement, clarity, pacing, and interaction. Three main problems emerged with AI-generated videos: too-fast pacing, not enough repetition, and no interactive questions. Younger students were more open to AI instruction, with minimal differences between genders.

Conclusions

AI-generated video instruction produced meaningful learning gains despite early design limitations, demonstrating real teaching potential with scalability advantages, including multilingual content delivery. Based on student feedback, the author improved the AI video design by slowing the narration, repeating key concepts, and emphasizing important terms. A preliminary social media survey showed overwhelming positive response to the refined videos. To address the need for interaction, a LangChain-based chatbot is currently being developed (expected this year) to answer student questions in real-time during video lessons. These findings suggest that AI-based instruction can effectively complement traditional teaching when optimized with student input, rather than replacing expert-led instruction.

131. AI-Assisted Learning in Pharmacy: ChatGPT Study Guides Show Promise and Reveal Need for Formal AI Training

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Additional Author:

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- Teresa Zghaib (Roseman University)
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- Arup Chakraborty (Roseman University)

Purpose

This study evaluated whether AI-generated study guides could improve quiz performance among first-year PharmD students and explored students' perceptions of AI tools in their learning.

Methods

A preliminary comparison involved 23 students evaluating study guides generated by four AI platforms (ChatGPT, Gemini, DeepSeek, and Claude). First-year PharmD students (n=26 from a cohort of 68) completed surveys about AI familiarity and usage patterns, then were randomly assigned to an AI-assisted group (n=15) receiving a ChatGPT-generated study guide or a control group (n=13) studying independently. Both groups completed a 16-item multiple-choice quiz on immune checkpoint inhibitor cancer drugs. Performance data were analyzed using descriptive statistics and Welch's t-test.

Results

Survey findings showed widespread AI adoption: 92% of students had used AI tools academically, with 69% using them to summarize materials and 90% willing to incorporate AI into study routines. While 90% believed AI could improve test performance, only 50% trusted AI's accuracy. The AI-assisted group achieved higher mean quiz scores (11.8/16, SD=2.51) than the control group (10.1/16, SD=2.96), representing an 11% improvement. This difference did not reach statistical significance, though a larger replication study may confirm the effect. Students reported better organization, time savings, and improved comprehension, but expressed concerns about accuracy verification and over-reliance. Students preferred ChatGPT for its superior organization and clarity. The study was recently repeated with significantly larger enrollment (n=62), and data analysis is in progress for a symposium presentation.

Conclusions

ChatGPT-generated study guides show promise for enhancing learning, with students demonstrating an 11% improvement in performance in the pilot study. The significantly larger replication study (n=62) will provide more definitive evidence. High AI adoption

(92%) and positive perceptions support AI's role in pharmacy education, yet concerns about accuracy and proper use remain. Because students used pre-written prompts, the findings highlight the need for formal AI training. The author is now offering an AI elective focused on prompt engineering and the implementation of agentic AI in pharmacy education to address this need.

132. Enhancing pharmacy student empathy toward patients with schizophrenia through simulation-based learning: a literature review and proposed virtual reality intervention

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Purpose

Schizophrenia is a mental condition characterized by delusions, hallucinations, disorganized speech or behavior, and negative symptoms. Patients with schizophrenia are at high risk for medication nonadherence and relapse, making provider empathy essential for effective care. Despite its importance, limited opportunities within pharmacy curricula to develop empathy-based skills leave students underprepared to support vulnerable populations. This project aims to (1) evaluate existing literature on simulation-based learning for healthcare student empathy, and (2) propose a virtual reality (VR)-based educational intervention to develop pharmacy student empathy and preparedness for counseling patients with schizophrenia.

Methods

A systematic PubMed search identified peer-reviewed randomized controlled trials published in the last five years. Search terms included “simulation,” “healthcare students,” “medical students,” “pharmacy students,” and “empathy,” limited to human studies published in English. Findings informed the design of a hypothetical trial in which thirty pharmacy students are randomly assigned 1:1 to a VR intervention or control group. The VR experience will immerse learners in a “day in the life” of a patient with schizophrenia during a pharmacist counseling session, incorporating auditory and visual hallucinations to illustrate challenges in treatment comprehension. Both groups will then participate in a standardized simulated patient encounter. Students' empathy scores will be assessed using self-, faculty-, and simulated-patient feedback.

Results

Of ten studies identified, eight met inclusion criteria. Seven studies found that simulation-based interventions significantly improved student empathy, patient-provider communication, and confidence in patient counseling across healthcare settings. Studies involving medical and nursing students demonstrated that VR and scenario-based simulations enhanced their ability to navigate challenging patient interactions. In the sole pharmacy study, decision-making games and aging simulations encouraged students to

consider both patient and pharmacist perspectives. No studies addressed schizophrenia-specific pharmacy training.

Conclusions

Simulation-based learning effectively enhances empathy and communication skills among healthcare students, but the lack of empathy training in mental illness highlights a significant gap in pharmacy education. These findings underscore the potential value of a VR-based intervention that places pharmacy students in the perspective of patients with schizophrenia, helping them better understand medication adherence challenges. The proposed trial assesses such an intervention's impact on empathy and readiness for patient-centered care.

133. Artificial Intelligence in Pharmacy Didactic Education: A Critical Meta-Analysis

- Presenting Author: Teresa Zghaib (Roseman University)

Additional Author:

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- Arup Chakraborty (Roseman University)

Purpose

Artificial Intelligence in Pharmacy Didactic Education: A Critical Meta-Analysis

Methods

A systematic search of peer-reviewed literature (2020-2025) was conducted using PubMed, ERIC, Scopus, and ProQuest databases. Search terms included ChatGPT, Claude, Gemini, LLMs, generative AI, agentic AI, RAG (Retrieval-Augmented Generation), and pharmacy education. Articles specifically addressing AI utilization in pharmacy didactic teaching were analyzed for implementation approaches, student perceptions, learning outcomes, and academic integrity concerns. Six representative studies encompassing survey data, experimental designs, and scoping reviews were selected for in-depth analysis.

Results

Current evidence reveals widespread adoption of AI tools among pharmacy students, with ChatGPT being the most prevalent. Anderson et al. (2024) found that 48.5% of pharmacy students used AI for personal reasons and 30.2% for academic purposes, with students requesting formal integration of AI training into curricula. Experimental studies demonstrated measurable benefits: Baker et al. (2024) reported improved student confidence and communication skills when using ChatGPT for patient presentations, while a Norwegian randomized study showed positive trends in test score improvements. Our comparative analysis of four LLMs (ChatGPT, Claude, Gemini, DeepSeek) for generating biochemistry study guides revealed differential performance patterns, with BERT scores and student perception data indicating varying effectiveness across platforms. Our implementation of AI-generated educational videos for complex biochemistry topics demonstrated novel approaches to didactic content delivery. International surveys (n=2,009 across nine countries) identified three key adoption dimensions: utility-driven adoption, affordability concerns, and social influence factors. Serna-González et al. (2024) evaluated LLMs for pharmacokinetic dosing calculations, revealing variable accuracy requiring prompt optimization. Mortlock & Lucas's (2024) scoping review identified critical gaps in ethical guidance, academic integrity protocols, and structured curriculum integration. Over 20% of students reported over-reliance on AI for assignments, raising concerns about critical thinking development.

Conclusions

AI tools demonstrate significant potential to enhance pharmacy didactic education by improving student engagement, providing personalized learning support, and delivering innovative content.

134. Cognitive Impact of Large Language Model Dependence for Writing: A Preliminary Study

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Purpose

Since the launch of ChatGPT, Large Language Models (LLMs) have quickly gained traction due to their myriad linguistic skills. Perhaps most salient of these is the ability to generate a text-based response to a provided prompt. Publicly accessible and easy to use, artificial intelligence (AI) systems have increasingly become more present as a tool to supplement–and even replace–human writing activities. This recent trend calls into question the cognitive outcomes of this LLM dependence. The public availability of the pocket calculator preceded a decrease in arithmetic skills. Similarly, outsourcing writing tasks to AI tools could produce an analogous decline in human cognition.
Our research is centered on exploring the cognitive skills that LLM use could impact. By identifying which faculties are affected, we can design a study methodology to investigate whether AI-dependence for writing erodes human cognition.

Methods

Following PRISMA guidelines, a review of the PubMed, GoogleScholar, Academic Search Premier, ProQuest, and APA PsycNet databases will be conducted. Papers published before 2016–a 10 year margin–will be excluded to ensure the most up-to-date information. Studies will be included if they pertain to the cognitive skills affected by LLM use.

Results

Work in Progress

Conclusions

Work in Progress

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