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UNE UNIVERSITY OF NEW ENGLAND

INNOVATION FOR A HEALTHIER PLANET

A Message from Dean Havrda

Dear Colleagues,

It is my pleasure to reflect on the success of the University of New England College of Osteopathic Medicine's inaugural Spring Research Update and Lightning Talk event. This first-of-its-kind gathering at UNE COM showcased the depth, rigor, and impact of scholarship across our academic community and affirmed the central role of research in advancing our institutional mission.

The abstracts presented in this year's bulletin spanned biomedical discovery, clinical outcomes research, medical education, and population health. What was particularly striking was the consistent alignment of this work with real-world challenges—improving patient outcomes, advancing health equity, and strengthening the training of future physicians.

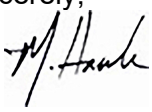
The abstracts presented here exemplify the scope, caliber, and relevance of scholarship at UNE COM. A Large-scale meta-analysis examining carotid endarterectomy outcomes examined data from more than 80,000 patients to reinforcing evidence-based surgical decision-making in contemporary practice. A translational cancer research study identified the Kynurenine/AhR pathway as a promising therapeutic target, with preclinical models demonstrating near-complete tumor regression. An innovative 48-hour hospice immersion experience highlighted the impact of deeply immersive, experiential learning on students' confidence, emotional intelligence, and preparedness for end-of-life care.

Equally important was the energy of the "Lightning Talk" event. With over 100 attendees, its colloquial format fostered dynamic, cross-disciplinary exchange among students, faculty, and clinical partners. Strong student participation underscored the effectiveness of our mentoring environment and research training efforts.

This event marks an important milestone for UNE COM. It not only celebrates current accomplishments but also signals our continued momentum in building a sustainable and impactful research enterprise—one that integrates discovery, clinical relevance, and educational innovation.

I extend my sincere thanks to everyone who contributed to the success of this event. I look forward to seeing this initiative continue to grow -and to seeing everyone at the Fall Forum!

Sincerely,



Matt Havrda
Associate Dean of Research and Scholarship
University of New England College of Osteopathic Medicine

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Modern-Era Outcomes of Regional versus General Anesthesia for Carotid Endarterectomy: A Meta-Analysis

Beisenova[1], K, OMS IV, Dacosta[1], L, OMS III, Sudhakar[1], H, OMS III, Dikener[1], E, OMS I, Mendola[1], R, OMS IV, Wallen[2], T, D.O.

[1]University of New England College of Osteopathic Medicine, Portland, Maine, [2]Department of Cardiothoracic Surgery, Geisinger Health System, Wilkes-Barre, PA

Abstract

Introduction: Carotid artery stenosis is a common atherosclerotic condition, responsible for 15-20% of ischemic strokes worldwide [1]. Carotid endarterectomy (CEA) is a revascularization procedure for internal carotid artery stenosis and stroke prevention, performed under regional (RA) or general anesthesia (GA). Since the largest randomized comparative trial (RCT) in 2008 [2], only a few randomized studies have examined anesthesia technique for CEA. Despite advances in perioperative care, contemporary comparative data remain limited. In addition, only one meta-analysis of these studies is currently available. Our systematic search identified eight trials published between 2011 and 2022. This study provides an updated synthesis of recent evidence.

Methods: A systematic review and meta-analysis was conducted using PRISMA methodology. PubMed, Embase, and Cochrane databases were searched using key terms and MeSH/Emtree terms including “carotid endarterectomy,” “stroke,” and “mortality”. Studies involving human participants published between 2010 and 2026 that directly compare RA to GA, and report relevant outcomes were included (n = 8). Data were analyzed with a random-effects meta-analysis with the metafor package in RStudio. Heterogeneity was assessed using I^2, and outcomes were expressed as risk ratios. Meta-regression using mixed-effects model showed trends in primary outcomes over time.

Results: Primary (stroke, death) and secondary (MI, AKI, respiratory problems) outcomes from eight studies (n=80,047) comparing RA to GA were examined. No statistically significant differences were observed between anesthesia techniques ($p > 0.05$), demonstrating comparable safety profiles. RA vs GA outcomes also did not significantly vary with time, as per the performed meta-regression comparing post-2010 studies to the GALA trial (coefficient for year = −0.0023, 95% CI [−0.0262, 0.0216], $p = 0.85$). Very little residual heterogeneity among studies was found ($I^2 = 0\%$, QE $p = 0.87$), indicating highly consistent findings across the studies. The incidence of stroke was also shown to be declining with time ($R2 = 0.645$).

Conclusion: There were no significant variations in primary or secondary patient outcomes between CEA under RA versus GA. This suggests that the choice of anesthesia does not significantly impact patient safety in contemporary practice, which is in line with results of the GALA trial. Both CEA anesthesia options remain safe and effective.

An Acute-on-Chronic Presentation of Pneumatosis Cystoides Intestinalis: A Case Report

Cubello[1], Michael, OMS III, Giannone[2], James, D.O.

[1]University of New England College of Osteopathic Medicine, Portland, Maine, [2]St. Joseph's Physicians Surgical Services, Syracuse, New York

Abstract

Introduction: Pneumatosis cystoides intestinalis (PCI) is a rare manifestation of pneumatosis intestinalis (PI), characterized by intramural gas cysts within the gastrointestinal tract. While frequently benign and many times idiopathic, PCI can also be associated with underlying critical conditions. Radiographically, benign cases of PCI can mimic life-threatening abdominal pathology, creating diagnostic uncertainty and challenging operative decision-making.

Case: We report a case of a 71-year-old male with a three-year history of progressive abdominal bloating, early satiety, postprandial pain, and significant weight loss who presented acutely with worsening abdominal symptoms following a mechanical fall. Computed tomography (CT) revealed extensive small bowel pneumatosis with associated pneumoperitoneum. Despite concerning imaging findings, the patient lacked peritoneal signs, laboratory abnormalities, or evidence of mesenteric ischemia on computed tomography angiography (CTA). Given persistent symptoms and worsening radiologic appearance, exploratory laparotomy was pursued. Intraoperative findings demonstrated a segment of dilated, atonic small bowel containing diffuse intramural air cysts without evidence of ischemia, perforation, obstruction, or purulent peritonitis. Small bowel resection with primary anastomosis was performed. The patient recovered uneventfully and experienced complete resolution of chronic gastrointestinal symptoms at postoperative follow-up.

Discussion: This case highlights the importance of integrating clinical presentation with laboratory and radiologic findings when evaluating pneumatosis intestinalis. Although small bowel involvement is often associated with pathologic etiologies, PCI may present as an acute exacerbation of chronic disease. Selective surgical intervention can be both diagnostic and therapeutic in symptomatic patients.

Acknowledgements: St. Joseph's Health Hospital, Department of General Surgery. It was determined that this case report does not meet the definition of human subject's research, and IRB review is not required. Validated by St. Joseph's Health/St. Peter's Health Partners IRB.

Situs inversus totalis in an 86-year-old male cadaver: Vascular Anomalies in the Gastrointestinal System.

Daniel, J, OMS-IV; Du, D, OMS-IV; Gammaitoni, N, OMS-IV; Isaac, A, OMS-IV; Talsma, J, M.S;

University of New England College of Osteopathic Medicine, Department of Biomedical Science, Portland, Maine

Abstract

Introduction: Situs inversus is a congenital disorder that is characterized by the reversal of visceral organs along the left-right axis. It falls onto a spectrum of laterality distribution, including situs solitus (normal), situs ambiguous (heterotaxy), and situs totalis (reversed). Situs inversus can occur alone or as part of Kartagener syndrome or primary cilia dyskinesia. Dextrocardia and vascular anomalies have been previously discussed in the situs literature. This case report of an 86-year-old male cadaver with situs inversus totalis aims to demonstrate some anomalous branching of the abdominal vasculature and broaden the body of knowledge about this disorder.

Methods: This study is being conducted using a cadaver donated to the University of New England College of Osteopathic Medicine's Anatomical Donor Program. In conjunction with UNECOM's Anatomy department faculty, a thorough dissection and comprehensive literature review using cadaveric and clinically relevant peer-reviewed articles is being completed. Additionally, throughout the phases of dissection, high-resolution photography of the anatomical variation will add an important visual aid for understanding the potential pathology seen in patients presenting with a medical history of situs inversus totalis.

Results: Four branches arose from the celiac trunk: the functional left gastric artery (LGA), common hepatic artery (CHA), splenic, and an accessory right suprarenal artery. The LGA gave rise to an esophageal branch and a left hepatic artery (LHA). The CHA trifurcates ~4cm from its origin into the gastroduodenal artery, cystic artery, and the middle hepatic artery. The SMA gave rise to a replaced right hepatic artery (RHA), which provided a second cystic artery coursing posterior to the gallbladder. The hepatic arterial configuration corresponds to Michels Type IV anatomy in the setting of situs inversus totalis. Additional anomalous branching patterns, including CHA trifurcating and dual cystic arteries, were also observed.

Conclusion: Our findings suggest that situs inversus totalis, due to the vast number of embryologic variables, can be a reversed version of normal, or a vastly different maze of vasculature. Without a bigger picture clinical exam with multiple diagnostic modalities on a living patient, it is hard to say the functionality of having multiple HAs or cystic arteries. Additionally, further genetic and radiographic studies would deepen our understanding of this specimen.

Acknowledgement: The University of New England College of Osteopathic Medicine, and the anatomical donor program.

Quantification of Force Applied During Osteopathic Manipulative Treatment: A Scoping Review

Flood[1], B, OMS II, Wood[1 2], S, Ph.D., McCullen[1], G, M.D., M.S., Yee[1], M, D.O.

[1]University of New England College of Osteopathic Medicine, Portland, Maine, USA
[2]Portland Laboratory for Biotechnology and Health Services, University of New England, Portland, Maine, USA

Abstract

Introduction: Osteopathic Manipulative Treatment (OMT) involves the application of compression, traction, torsion, and shearing forces directed at specific fascial and musculoskeletal structures to provide subjective patient relief and objective physiological improvements. There is interest in the osteopathic community to investigate the mechanobiological impacts of OMT at a microscopic level, with a shift in emphasis to quantifiable physiological changes that can directly inform mechanistic studies. There are few studies in which OMT force is quantified to determine the exact force vectors and magnitude required to produce a measurable result. This study aimed to answer two questions: 1) what methods have been used to quantify the applied forces and resulting physiological effects of OMT, and 2) how can the resulting data be integrated to better understand the effects of OMT at a cellular level?

Methods: A literature review was conducted via Google Scholar and ScienceDirect database searches using the search "'osteopathic manipulative treatment' AND 'force measurement'", specifically considering peer-reviewed studies originally published in English between 1950-2025. Predetermined inclusion and exclusion criteria were used to identify studies that quantified the force magnitude applied during specific OMT techniques (Question 1), and measured results such as tissue length, lymphatic drainage, etc. (Question 2).

Results: Out of 268 publications considered, 23 were removed as duplicates and 237 were excluded, leaving 7 publications included in the review. These 7 articles proposed unique mathematical models and force sensors as means of both quantifying the magnitude of force and identifying force vectors during OMT or used tissue models to investigate the mechanobiological effects of different force types. There were no articles found that both quantified the force applied by a practitioner to a patient's region of somatic dysfunction during a specific OMT technique (Question 1) and simultaneously obtained quantifiable results (Question 2).

Conclusion: A consensus is needed in osteopathic literature regarding methods of accurately quantifying OMT force and determining how superficial force is translated to force reaching target structures. Further study of the relationship between force and its physiological effects will bridge the gap between OMT and mechanobiology, and lead to greater understanding of the mechanics that underly osteopathic medicine.

Acknowledgements: University of New England College of Osteopathic Medicine.

Long-Segment Right Colon Volvulus in a Young Adult with Severe Developmental Disability: An Unusual Presentation and Diagnostic Challenge – A Case Report

Ghanem[1], J., OMS III, Pham[1], L.N., OMS III, Kerner[2], T., D.O.

[1]University of New England College of Osteopathic Medicine, Portland, Maine
[2]Lower Bucks Hospital, Department of Surgery, Bristol, Pennsylvania

Abstract

Introduction: Colonic volvulus refers to the torsion of a segment of the colon around its mesentery, resulting in luminal obstruction and potential vascular compromise [1]. Sigmoid volvulus accounts for most cases and predominantly affects older adults, whereas cecal volvulus is less common and more frequently occurs in younger patients in the US [2]. Extension of a cecal or right colon volvulus into the transverse colon is exceedingly rare and can pose diagnostic challenges when imaging findings overlap with toxic megacolon or acute colonic pseudo-obstruction [3].

Case: A 22-year-old woman with a PMH of agenesis of the corpus callosum, neuromuscular scoliosis, and severe intellectual disability, presented with progressive abdominal distension and obstipation. Over approximately 48 hours, she developed worsening distension and cessation of stool output. At home, PEG decompression yielded bilious output without symptomatic relief, and an enema produced a small bowel movement, prompting emergency department evaluation. CT of the abdomen and pelvis with IV contrast demonstrated marked dilation of the right colon occupying much of the abdominal cavity, with a maximal diameter of approximately 13 cm. A water-soluble contrast enema demonstrated brisk passage of contrast from the rectum through the descending colon, followed by abrupt tapering and termination at the distal transverse colon with a classic bird's beak appearance, consistent with a mechanical point of torsion. Given concern for impending perforation in the setting of rising leukocytosis and lactate, urgent exploratory laparotomy was recommended. Under general anesthesia, laparotomy revealed a massively distended colon just beneath the peritoneum. A right hemicolectomy was then performed with resection from the terminal ileum through the proximal transverse colon, followed by a side-to-side stapled ileocolic anastomosis. Patient was discharged on postoperative day 7 at her baseline functional status with normal bowel function.

Discussion: This case highlights a unique presentation of right colon volvulus in a medically complex young adult, characterized by an uncommon long-segment volvulus extending into the proximal transverse colon with mechanical obstruction. Initial CT imaging raised concern for toxic megacolon and colonic pseudo-obstruction, contributing to diagnostic uncertainty. A water-soluble contrast enema played a decisive role when CT findings and the clinical context were discordant.

References:

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2. Symer MM, Pigazzi A: Management of volvulus. Gastrointestinal Surgical Emergencies. Nigri G, Tsoulfas G (ed): American College of Surgeons, Chicago, IL; 2021. 213-9.
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Acknowledgements: The authors thank the patient, patient's caregivers and legal guardian for their cooperation and for providing consent to publish this case. We also acknowledge the multidisciplinary surgical, anesthesia, nursing, and radiology teams at Lower Bucks Hospital involved in the patient's care

48 Hour Hospice Immersion for Future Surgeons: Training for Moments That Matter

James Gray, OMS-II; Brandon Etuka, OMS-II; Anjana Govindaraj, OMS-II; Marina Farag, OMS-II; Marilyn Gugliucci, PhD

The University of New England College of Osteopathic Medicine, Portland, Maine

Abstract

Introduction: Current pre-clinical medical education fails to equip future surgeons for palliative/end-of-life (EOL) care. Needs assessment surveys at multiple surgical programs produced results elucidating that most surgeons report inadequate training in this area. As 40% of surgeries at academic centers are palliative in nature; this illustrates that there is a serious gap in training for future surgeons. A 48-Hour Hospice Home Immersion Project uniquely addresses this by immersing medical students in an ICU-level hospice house that fosters empathic, holistic care for acutely ill and dying patients.

Methods: This ethnographic/autobiographic study immersed four preclinical medical students for 48-hours (live-in) hospice immersion at Gosnell Memorial Hospice House. Students performed direct patient care, family support, and post-mortem care; working with interprofessional staff. Reflective journals were written pre-immersion, during the immersion, and 14 days post-immersion, documenting subjective and objective observations, experiences, and emotional responses. Content analyses was applied identifying common themes and representative quotes.

Results: Four key themes included: (1) increased confidence in EOL care; (2) development of an “emotional toolbox” for engaging with death and suffering by patients/families; (3) increased awareness and understanding of the gaps in palliative care education; and (4) implications for future surgeons caring for patients with terminal disease.

Conclusion: The impact of this 48-hour hospice immersion provided education that promoted emotional and professional preparedness for palliative/EOL care, potentially representing a scalable intervention to better prepare future surgeons to care for dying patients and their families. Future studies should expand the sample size and employ additional systematic analytic methods.

Acknowledgment: We gratefully acknowledge the Hospice of Southern Maine for the room, beds, meals, and staff resources provided for the UNECOM students while asking for no financial remuneration. IRB (# 19.05.08-007) exemption was obtained through the University of New England Institutional Review Board.

Histologic Mapping of Rami Communicantes at the T4–T5 Sympathetic Ganglia: Implications for Thoracoscopic Sympathectomy

Authors: Stilley, A, OMS II, Gray, J, OMS II, Miller, M, OMS II, Latif, T, OMS II, Talsma, J, M.S.

University of New England College of Osteopathic Medicine, Portland, Maine

Abstract

Introduction: Palmar hyperhidrosis affects millions worldwide and significantly impairs quality of life. Endoscopic thoracic sympathectomy (ETS) remains the gold-standard surgical treatment, achieving symptom resolution in over 95% of patients. Although successful, the surgery is imperfect. At times it obtains imperfect results with incomplete dryness, which is thought in part to be due to variability of ganglia cell distribution. Histologic characterization of the T4–T5 sympathetic ganglia and their rami communicantes remains limited. This study aims to define the anatomical organization and variability of rami communicantes at the T4–T5 level to better inform surgical targeting during ETS.

Methods: Forty-five T4–T5 sympathetic ganglion specimens from cadaveric donors were examined using serial histologic sectioning. Each specimen was evaluated microscopically to identify white, grey, and accessory rami communicantes. Distances between rami and the distribution of ganglion cells relative to rami entry and exit points were measured in well-oriented sections. Histological confirmation of ganglion cell presence was used to assess the extent of neural tissue surrounding each ramus.

Results: Preliminary examination demonstrates substantial variability in the number and orientation of rami communicantes at the T4–T5 level, including accessory rami. Ganglion cells extend variably along the sympathetic chain relative to both white and grey rami, suggesting that clinically relevant neural tissue may extend beyond visually apparent ganglia.

Conclusion: The T4–T5 sympathetic chain demonstrates considerable histologic variability that may influence the completeness of thoracoscopic sympathectomy. Mapping the distribution of rami communicants and associated ganglion cells may help refine surgical targets and guide the extent of resection required to achieve effective denervation while minimizing complications.

Management of Acute Aortic Dissection in Patients Receiving Direct Oral Anticoagulants: A Literature Review

Gray, J, OMS II

University of New England College of Osteopathic Medicine, Portland, Maine

Abstract

Introduction: Acute aortic dissection (AAD) is a rare but life-threatening cardiovascular emergency that requires rapid diagnosis and urgent intervention. At the same time, the use of direct oral anticoagulants (DOACs) has increased substantially because of their widespread use in conditions such as atrial fibrillation and venous thromboembolism. Many of the major risk factors for AAD, including advanced age, hypertension, and cardiovascular disease, overlap with indications for DOAC therapy. As a result, clinicians increasingly encounter patients presenting with aortic dissection while anticoagulated. Management of these patients presents unique challenges, particularly regarding perioperative bleeding risk, the role of reversal agents, and the timing of surgical intervention.

Methods: This literature review evaluates published, peer-reviewed reports describing patients presenting with thoracic or abdominal aortic dissection while taking DOAC medications. PubMed and Embase databases were searched through February 2026 using combinations of terms related to aortic dissection, DOAC therapy, reversal agents, surgical timing, and clinical outcomes. Studies published after 2010 reporting original clinical data, including case reports, case series, and observational studies, were screened and evaluated. Database searches identified 108 records, with 67 studies meeting criteria for full review after screening. These studies were analyzed to identify evidence that may guide clinical practice.

Results: Existing literature suggests that anticoagulation with DOACs may increase perioperative bleeding risk in patients undergoing emergent treatment for AAD and may complicate surgical decision making. However, available evidence is limited primarily to small observational studies and case reports, and substantial variability exists in reported management strategies.

Conclusion: The is a growing clinical dilemma regarding AAD and DOACs with limited evidence to guide management. Larger, multicenter, and prospective investigations are needed to better characterize risk and inform evidence-based treatment strategies for patients taking DOACs and presenting with AAD.

Acknowledgement: This work was conducted at the University of New England College of Osteopathic Medicine. The author thanks Dr. Walter DeNino for mentorship and guidance in the development of this review.

Survival Corridor: Reconstructing the Craniofacial Trajectory of Prince Henry's V Infamous Arrow Wound to the Face.

James Gray BS , Eleanore Gray BS

University of New England, Department of Biomedical Sciences.

Abstract

Introduction: At the Battle of Shrewsbury in 1403, Prince Henry V sustained a penetrating facial injury from a narrow military bodkin style arrow. John Bradmore, a royal surgeon, was subsequently tasked with its removal. The operation was successful and would become one of the most remarkable surgical interventions of the medieval period.

Methods: Here we review the case, drawing on Bradmore's primary account, modern principles of penetrating facial trauma, and three-dimensional anatomical modeling, to propose a clinically plausible path of injury.

Results: Bradmore recorded that the projectile entered beside the nose on the left side, traveled somewhat transversely, and ultimately lodged approximately six inches deep, coming to rest against a posterior skull bone. Although his description is anatomically imprecise, the arrow likely penetrated the face and traversed through the maxillary sinus. Bradmore's description of transverse travel supports a lateral-to-medial trajectory, as does the absence of massive hemorrhage or exsanguination, which strongly argues against injury to the internal carotid artery or jugular vein. Although not impossible, significant nasopharyngeal involvement is unlikely given the lack of reported catastrophic bleeding or recurrent epistaxis, findings that would be expected with deeper posterior penetration based on contemporary trauma evidence and are absent in the historical record. The trajectory between the medial nasopharynx and relatively lateral neurovasculature suggests a trajectory toward the pterygopalatine fossa (PPF). Penetrating foreign bodies in the PPF may displace vessels and nerves rather than transect them, thereby limiting catastrophic hemorrhage. Alternatively, an inferior trajectory could direct damage beneath the central contents of the PPF, where non-fatal injury to smaller palatine vascular branches could have occurred.

Conclusion: The evidence supports a posteromedial course: lateral to the oropharynx, inferior to the pterygopalatine fossa, and medial to the carotid artery, jugular vein, and associated cranial nerves. The arrow most plausibly came to rest near the ipsilateral clivus or upper cervical spine (C1–C2), accounting for the documented six-inch depth while preserving the great vessels.

Primary Source: John Bradmore, *Philomena*, British Library MS Sloane 2272, quoted in S. J. Lang, *The "Philomena" of John Bradmore and its Middle English Derivative: A Perspective on Surgery in Late Medieval England* (PhD diss., University of St Andrews, 1998), page 65.

Acknowledgements: The author would like to acknowledge UNE COM for its support of student research and scholarship. The author gratefully acknowledges the British Library, which preserves the manuscript of John Bradmore's *Philomena* (MS Sloane 2272). Thanks are extended to the University of St Andrews for making Sheila J. Lang's doctoral thesis accessible through its research repository, which enabled consultation of the manuscript transcription used in this study. The preservation and accessibility of these historical materials made this investigation possible.

The Unexpected Twin: A Heterotopic Pregnancy Case Report

Kaithamattam[1,2], J, OMS III; Jurus[1,2], D, D.O.

[1] University of New England College of Osteopathic Medicine, Portland, ME, [2] Southern New Hampshire Health Systems, Nashua, NH

Abstract

Introduction: Heterotopic pregnancy (HP), defined as the simultaneous occurrence of an intrauterine pregnancy (IUP) and an ectopic pregnancy, is a rare but potentially life-threatening condition. Although historically estimated at 1 in 30,000 pregnancies, the incidence has increased with assisted reproductive technologies. Diagnosis is challenging because the presence of a confirmed IUP may lower suspicion for a concurrent ectopic pregnancy.

Case: A 34-year-old gravida 7 para 1-0-5-1 at 9 weeks gestation who conceived without assisted reproductive technology presented with right lower quadrant abdominal pain, nausea, and vomiting. Prior ultrasound confirmed a viable IUP with fetal cardiac activity. Due to her history of two prior right-sided ectopic pregnancies, repeat imaging was performed and revealed a 2-cm right adnexal mass with surrounding free fluid concerning for ectopic pregnancy. Diagnostic laparoscopy revealed hemoperitoneum and a right tubal mass. A laparoscopic right salpingectomy confirmed heterotopic pregnancy while preserving the intrauterine gestation. Concurrent intrauterine gestation was not disturbed following surgery and continues healthy course.

Discussion: This case underscores the diagnostic challenge of heterotopic pregnancy and highlights an important clinical lesson: **the presence of a confirmed intrauterine pregnancy does not exclude a concurrent ectopic pregnancy**. Nonspecific symptoms such as abdominal pain may mimic other conditions, increasing the risk of delayed diagnosis and tubal rupture. Clinicians should maintain a high index of suspicion, particularly in patients with risk factors such as prior ectopic pregnancy. Early recognition and prompt surgical management are essential to reduce maternal morbidity and maximize the likelihood of preserving the intrauterine pregnancy.

Accessing Outpatient Pediatric Subspecialty Care for Immigrant Families in Dallas County: Program Development and Preliminary Results

Khan[1], S, M.P.H., OMS III, Salinas[2], N, M.D., Trevino[2], A, M.D., Loria[2], H, M.D., M.P.H.

[1]University of New England College of Osteopathic Medicine, Portland, Maine [2]UT Southwestern Medical Center, Department of Family and Community Medicine, Dallas, Texas

Abstract

Introduction: In the United States, approximately one in four children is foreign-born or lives with a foreign-born parent. Children in immigrant families experience higher rates of uninsurance; in Dallas County, 15.7% of children are uninsured compared with a national average of 6%. Despite eligibility for public programs, complex enrollment processes and concerns about immigration consequences may prevent families from obtaining coverage. Immigrant families also face barriers to healthcare access, including lack of insurance and difficulty navigating the healthcare system. Although primary care often serves as the gateway to specialty referrals, limited research has examined barriers to pediatric subspecialty care among immigrant families. This study aimed to identify barriers to accessing pediatric subspecialty care for uninsured and underinsured children in immigrant families in Dallas County.

Methods: We conducted a qualitative, community-engaged study to inform development of the Dallas Pediatric Immigrant Subspecialty Care Network to coordinate referrals for uninsured and underinsured immigrant children. Community asset mapping identified clinics, hospitals, and organizations serving immigrant families. Focus groups with immigrant families were conducted using certified interpreters to identify priority subspecialty needs and barriers to care navigation. Surveys were distributed to pediatric subspecialists to assess willingness to participate in a referral network and referral capacity.

Results: Preliminary findings identified structural and social barriers limiting access to pediatric subspecialty care. Key barriers included lack of insurance coverage, difficulty navigating the healthcare system, limited awareness of available resources, transportation challenges, and concerns related to immigration status. Participants also reported long wait times, limited appointment availability, and fragmented referral processes. Community organizations were identified as critical partners in connecting families with trusted healthcare resources and assisting with care navigation.

Conclusion: Immigrant families in Dallas County face significant barriers to outpatient pediatric subspecialty care. Coordinated referral networks and partnerships with trusted community organizations may improve equitable access to subspecialty services.

Acknowledgements: We thank the participating community organizations, advocates, and immigrant families, and acknowledge support from UT Southwestern Department of Family and Community Medicine and the University of New England College of Osteopathic Medicine.

What Matters Most: Voices from Residents in Long-Term Care

Lindenau[1], J, OMS II, Tanikella[1], S, OMS II, Gugliucci[1], M, MA, PhD

[1]University of New England College of Osteopathic Medicine, Portland, Maine

Abstract

Introduction: Residents in long-term care settings often experience limited social interaction and disconnection. While prior research has focused on medical care and physical outcomes, studies show that personal connection, autonomy, and emotional well-being significantly affect quality of life for older adults. Loneliness is linked to poorer health outcomes and increased comorbidities. The focus of this study was to collect and thematically analyze resident narratives associated with Age Friendly Health Care, to ascertain the first "M", what "Matters most" to individuals living in long-term care. The aim was to provide insights that could contribute to the growing emphasis on person-centered care and guide future programming and care approaches in long-term environments.

Methods: This qualitative phenomenological study was conducted at an 81-bed nursing home in Biddeford, Maine (St. Andre Healthcare Facility). Residents with good cognition, English proficiency, and agreement to participate were recruited by the nurse manager. The first phase of this study included 8 residents. Each session involved reviewing the informed consent and conducting a ~45-minute interview. Researchers had 4 structured questions with prompts exploring residents' self-perceptions, life experiences, advice to their younger selves, and what matters most to them. Responses were recorded, verified with residents for accuracy, and analyzed qualitatively. Data were coded into primary themes and subthemes, with representative quotes selected to illustrate key findings.

Results: Analysis of resident narratives highlighted the diversity of what matters most to individuals in long-term care. While overarching themes such as family, relationships, autonomy and independence, and meaningful activities/hobbies emerged, each resident prioritized these differently, reflecting unique core values and life experiences.

Conclusion: Residents in long-term care maintain rich personal identities and distinct values shaped by their own life experiences. Results illustrated that understanding residents' personal priorities requires individualized attention and open communication, and how this is carried out shapes their wellbeing and quality of life. Focusing on what matters most to each resident highlights the importance of person-centered care, whereby learning about individual preferences, staff can tailor interventions and activities that support autonomy, engagement, and mental and physical health.

Acknowledgement: Thank you to St. Andre Healthcare Facility in Biddeford, Maine for hosting this project and to the residents who shared their time and experiences. This study was conducted with approval from the University of New England IRB.

Loss of Vglut2 in the Ventromedial Nucleus of the Hypothalamus Prevents Tonic Seizure Expression and SUDEP in a Mouse Model of Epileptogenesis

McLaughlin[1] K, OMS2; Igot[2] MI, BS; Nalwalk[3] JW, MSc; Ferland[1,2,3] RJ, PhD

[1] University of New England College of Osteopathic Medicine, Portland, Maine, [2] University of New England College of Osteopathic Medicine, Department of Biomedical Sciences, Biddeford, Maine, [3] Albany Medical College, Department of Neuroscience and Experimental Therapeutics, Albany, New York

Abstract

Introduction: Seizure progression in epilepsy reflects a fundamental reorganization of neural circuits that shapes the clinical phenotype and may underlie the risk of Sudden Unexpected Death in Epilepsy (SUDEP). The repeated flurothyl kindling model (RFKM) offers an experimental means of studying this process. With each successive exposure to flurothyl, seizure threshold declines, and after a 30-d incubation period, seizures initially confined to the forebrain (clonic seizure expression) expand to recruit brainstem circuitry (tonic seizure expression). Prior lesion studies and Fos activity mapping identified the ventromedial nucleus of the hypothalamus (VMH) as a potential gating structure that may facilitate recruitment of brainstem networks and tonic seizure expression.

Methods: Mice with deletion of the vesicular glutamate transporter gene, *Vglut2*, can silence neuronal activity. We therefore asked whether loss of *Vglut2* in the VMH could prevent tonic seizures and SUDEP in the RFKM. *Vglut2*$^{fl/fl}$ mice were bred to *Nr5a1*$^{cre+}$ mice (which express Cre selectively in the VMH). Individual male and female adult mice were placed in a chamber infused with 10% flurothyl. At generalized seizure onset, the chamber was opened and mice returned to room air. Latency to myoclonic jerk, latency to generalized seizure, and seizure phenotype were recorded across 8 daily trials (induction), followed by a 30-d rest (incubation) and flurothyl rechallenge. Seizures were graded: grades 1-2 reflect forebrain-dependent seizures; grades 3-7 denote progression from clonic to tonic seizures requiring brainstem activation. Mice were euthanized 90-min post-seizure and brains processed for Fos immunohistochemistry (IHC; for neural mapping).

Results: *Nr5a1*$^{cre+}$;*Vglut2*$^{fl/fl}$ mice showed normal decreases in generalized seizure threshold across trials. However, on rechallenge, no conditional knockout mice expressed tonic seizures (males: 0/15; females: 0/17), compared to 82% and 79% of male and female controls (*Nr5a1*$^{cre+}$;*Vglut2*$^{fl/+}$), respectively. Moreover, Fos IHC demonstrated that bilateral VMH Fos expression could not be reliable observed in *Nr5a1*$^{cre+}$;*Vglut2*$^{fl/fl}$ mice indicating a silencing of VMH activity.

Conclusion: These results identify the VMH as a critical node for epileptogenesis, specifically in gating seizure discharge from forebrain to brainstem networks. Elucidating the reorganizational pathways within the VMH that drive this process may reveal therapeutic targets for reducing tonic seizure expression and SUDEP risk.

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Inhibiting Macropinocytosis to Suppress Tumor Growth in Tuberous Sclerosis Complex

Patel, V, OMS III[1] , Rosenberg, C, OMS III[1] , Moyet, M, Ph.D.[1] , Lafleur, S, OMS IV[1] , Cox, W, OMS IV[1] , McGrath-Conwell, A, B.S., Henske, EP, M.D.[2] , Filippakis, H, Ph.D.

[1] Department of Biomedical Sciences, College of Osteopathic Medicine, University of New England, Biddeford, Maine, USA, [2] Division of Pulmonary and Critical Care Medicine, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, Massachusetts, USA

Abstract

Introduction: Tuberous Sclerosis Complex (TSC) is a disorder caused by loss-of-function mutations in TSC1 or TSC2, causing constitutive mTORC1 activation, unchecked proliferation, and increased nutrient demand. TSC-deficient cells meet this demand via macropinocytosis (MPC), engulfing extracellular proteins and degrading them into amino acids for growth. Our work suggests tryptophan metabolism through the kynurenine (Kyn) pathway drives MPC: rate-limiting enzymes TDO and IDO produce Kyn, activating the aryl hydrocarbon receptor (AhR) in a feed-forward loop reinforcing MPC. We hypothesize that pharmacologic Kyn pathway inhibition will block MPC and suppress TSC tumor progression.

Methods: To investigate this, we used a xenograft model of TSC2-deficient cells. Mice (8/group) received daily intraperitoneal injections of AhR inhibitors (SR1, 120 µg/kg; CH-223191, 10 mg/kg) or the IDO inhibitor Linrodostat (25 mg/kg). Rapamycin (3 mg/kg, three times weekly) served as a positive control for mTORC1 inhibition. To quantify MPC in vivo, mice were injected retro-orbitally with dextran-FITC (0.5 mg/kg) 24 hours before sacrifice. Tumors were measured twice weekly, fixed and processed for immunofluorescence, and MPC was quantified by ImageJ analysis of dextran uptake.

Results: The experimental treatments produced distinct effects on tumor volume. Treatment with SR1 or CH-223191 (AhR inhibitors) resulted in near-complete tumor regression (~90%, $p<0.01$), highlighting the Kyn/AhR axis as a critical tumorigenic pathway. IDO1 inhibition with Linrodostat slowed tumor growth but did not achieve arrest or regression (40%, $p<0.05$). As expected, rapamycin halted tumor growth (50%, $p<0.01$), consistent with its role as the current standard of care for TSC. Ki67 expression was strongly suppressed in CH223191 and SR1-treated tumors, confirming blockade of proliferation in vivo. Immunofluorescence imaging showed that reduced tumor size correlated with decreased dextran-FITC uptake (~60%, $p<0.05$), indicating that Kyn pathway inhibition blocks MPC *in vivo*.
Conclusion: These data provide the first preclinical evidence that MPC is a targetable metabolic vulnerability in TSC2-deficient tumors. Although IDO inhibition yields a partial response, direct AhR antagonism is more potent, inducing regression of established tumors. These findings suggest that targeting the Kyn/AhR pathway is a promising therapeutic strategy for TSC-associated tumors.

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Title: Re-Evaluating Prophylactic Mesh in Radical Cystectomy: No Reduction in Parastomal Hernia Formation

Platteter[1], E, OMS II, Cole[2],A, M.D., Eldin[2], M, M.D., M.P.H, White[3], R, M.D., James[2], E, B.A., M.P.H, Howard[2], J, M.D., Ph.D,Ryan[2], S, M.D., Hayn[2], M, M.D., Sammon[2], J, D.O.

[1]University of New England College of Osteopathic Medicine, Portland, ME, [2]Maine Medical Center, Portland, ME, [3]Vanderbilt Medical Center, Nashville, TN

Abstract

Introduction: Parastomal hernia (PH) is a frequent complication following ileal conduit creation at radical cystectomy (RC), with reported rates approaching 30%. Evidence supporting routine prophylactic mesh placement to reduce PH incidence remains inconclusive. We evaluated whether prophylactic mesh placement at RC reduces PH incidence, impacts fascial opening size, or subsequent repair rates.

Methods: We identified 277 consecutive patients who underwent RC with ileal conduit urinary diversion at a single institution. After excluding 50 patients for missing follow-up or incomplete data, 227 patients were analyzed. Mesh placement was performed at surgeon discretion. The primary outcome was radiographic PH development; secondary outcomes included fascial opening size and PH repair rates. Fascial opening size was compared between groups using the Mann–Whitney U test. Multivariable logistic regression identified independent predictors of PH formation, including BMI, fascial opening size, and surgical approach.

Results: Baseline demographics were similar between groups. Of 227 patients, 80 (35%) received prophylactic mesh. PH developed in 71 patients (31%), with similar rates in mesh and non-mesh groups (25% vs. 27%, $p = 0.58$). Patients with PH had significantly larger fascial openings ($p < .001$), though fascial opening size did not differ between groups ($p = .111$). Mesh placement did not reduce PH risk (OR 0.79, $p = .5$) or likelihood of subsequent repair (OR 0.68, $p = .3$). Higher BMI and fascial openings > 25 mm were independently associated with PH (both $p < .001$); open surgical approach was protective (OR 0.34, $p = .003$).

Conclusions: Prophylactic mesh placement at RC with ileal conduit creation was not associated with reduced PH incidence or smaller fascial opening size. The absolute difference between groups was only 2% (25% vs. 27%), corresponding to one fewer case per 50 patients treated. These findings do not support routine prophylactic mesh use as a preventive strategy against PH.

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Where Compassion and Medical Education Intersect: Development of Emotional Intelligence through a 48-Hour Hospice Home Immersion

Turcotte, D, OMS II, Desaulnier, J, OMS II, Moschella, S, OMS II, Puri, J, OMS II

Department of Geriatrics Education and Research, *University of New England College of Osteopathic Medicine*, Portland, Maine

Abstract

Introduction: End-of-life (EOL) care is an essential component of medical practice, however, dedicated instruction in this area remains underrepresented in medical education. The *University of New England College of Osteopathic Medicine*'s (UNE COM) *Learning-by-Living: 48-Hour Hospice Home Immersion* project strives to investigate whether medical student immersions at the Gosnell Memorial Hospice Home for 48 hours enhances students' education and comfort with patient dying and death. This project centered on building an "emotional toolbox" to enhance students' capacity to navigate emotionally complex clinical scenarios.

Methods: The Hospice Home Immersion is a qualitative, ethnographic, and autobiographical research project designed to examine medical students' first-person experiences of living in an ICU-focused hospice home for 48 hours and how this immersion may influence their development as future physicians. Students wrote journals (i.e., the data) during three phases: (1) pre-field work (seven days prior to the immersion), (2) field work (the 48-hour immersion), and (3) post-field work (up to fourteen days post-immersion). Each stage involved descriptive and detailed accounts of the students' experiences, thoughts, and actions. Content analysis of four student journals from December 12-17, 2025 was employed, which was first done individually and then collectively to ensure interrater reliability. Themes were defined and representative quotes were coded.

Results: Although many themes were identified and coded, one was considered to be the most significant theme: "Building an Emotional Toolbox." This theme encompassed students' reflections of their hands-on patient care, family support, and postmortem care experiences collected with an interprofessional staff and on their own. Students' personal stories and intimate learning experiences demonstrated significant emphasis on the development of emotional maturity in EOL and hospice care. Navigating EOL care allowed for skill development that they plan to bring into their careers as physicians. Two such skills included how to navigate patient and family-sensitive conversations with openness and empathy.

Conclusion: The UNE COM 48-Hour Hospice Home Immersion project created impactful learning, skill development, and EOL experiences that augmented students' confidence and competence to be empathetic and skilled providers.

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Patterns of Hospital Closure and Service Loss Following Private Equity Acquisition in U.S. Acute Care Hospitals

Rodriguez, K, OMS I[1]; Elzey, A, OMS I[1]; McCullen, G, M.D., M.S.[1]

[1]University of New England College of Osteopathic Medicine, Portland, Maine

Abstract

Introduction: Private equity (PE) investment in U.S. hospitals has grown rapidly over the past two decades. PE firms acquire healthcare organizations to generate returns for investors, often by restructuring finances, selling valuable assets such as real estate or equipment, and reducing or eliminating less profitable services before eventual resale. While this model may improve financial performance, concerns have emerged regarding its impact on patient access to care, particularly in vulnerable communities. This study aimed to examine patterns of hospital closure and service loss following PE acquisition and to assess whether ownership is concentrated among a limited number of systems.

Methods: A retrospective descriptive analysis was conducted on 20 U.S. acute care hospitals acquired by PE firms or PE-backed systems between 2004 and 2021. Hospitals were selected based on documented acquisition and availability of reliable public data, including acquisition of records, bankruptcy filings, and regulatory documents. Variables analyzed included hospital location (rural vs. urban), Medicaid expansion status, community median income, duration of ownership, and availability of key clinical services before and after acquisition. Primary outcomes included hospital closure or loss of essential services, including emergency care, obstetrics, behavioral health, pediatrics, and surgical services.

Results: Of the 20 hospitals analyzed, 15 (75%) closed entirely, while 5 (25%) remained open but experienced substantial service reductions. Most hospitals served vulnerable populations, with 65% located in communities below the national median income and 70% in Medicaid expansion states. Time from acquisition to closure or service loss ranged from 2 to 9 years. Service loss was determined by comparing pre- and post-acquisition availability, including losses from both hospital closures and service discontinuation at hospitals that remained operational. Among affected hospitals, obstetric services were lost in 60% of cases, behavioral health in 55%, emergency services in 40%, and pediatric services in 35%. Ownership was concentrated among a small number of recurring PE-backed systems.

Conclusion: In this sample, PE acquisition was frequently associated with hospital closure or significant reductions in essential services, raising concerns about access to care in lower-income communities. As a descriptive study, these findings demonstrate association rather than causation. Future research using larger national datasets is needed to further characterize these trends and inform policy discussions surrounding healthcare ownership and access.

Characterizing Neurons Receiving Direct Input from Corneal Primary Afferents in Mouse

Savoy[1], S, M.S., OMS II, Niyonkuru[1], K, Reynolds[2], S, Meng[1,2], I, Ph.D.

[1]University of New England College of Osteopathic Medicine, Biddeford, Maine, [2]University of Maine Graduate School of Biomedical Sciences and Engineering, Orono, Maine

Abstract

Introduction: The cornea requires lubrication from glandular secretions that are regulated by a neural reflex initiated by trigeminal primary afferent neurons. Corneal secretions occur with painful or potentially dangerous stimuli. In addition, secretions termed basal secretions transpire without any type of sensation to replenish tears lost through evaporation. Damage to these neural reflexes may lead to dry eye syndrome due to inadequate tear volume[1]. The goal of this research is to find an optimal treatment for dry eye disease. Such a treatment would increase the activity of neurons involved in basal secretions and inhibit the activity of neurons transmitting pain. To identify potential therapeutic targets on these subsets of neurons, it is necessary to identify corneal-projecting neurons and characterize alterations in gene expression in dry eye. The focus of this project is to determine the best approach to identifying corneal projecting primary afferent neurons for future transcriptomic analysis.

Method: Cornea intrastromal injections of AAVs (serotypes PHP.S, Retro, and 9; CAG and hSyn promoters) expressing tdTomato or Cre were performed in C57BL/6J, Sun1 reporter, and tdTomato reporter mice. Post perfusion, the trigeminal ganglia, brain, and brainstem were removed. Trigeminal ganglia tissues were cleared, immunolabeled, and imaged via light-sheet microscopy. The number of Sun1-GFP positive neurons and tdTomato positive neurons were quantified.

Results: All serotypes (PHP.S, Retro, and 9) and promoters (CAG and hSyn) were effective in labeling corneal projecting afferents. The greatest numbers of labeled cells were identified using Cre-expressing AAVs in Sun1 and tdTomato reporter mice. Projections to discrete regions in brainstem, the anterior trigeminal nucleus caudalis (TNC), the posterior TNC, and the lateral parabrachial nucleus were identified.

Conclusion: Characterizing the different types of neurons within the trigeminal ganglia improves our overall understanding of the neural reflex initiated by trigeminal primary afferent neurons. By identifying the neurons, molecular targets can be identified to improve corneal secretions using spatial transcriptomics. This will aid in combating dry eye syndrome and reducing chronic eye pain.

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Metabolomic Profiling of Normal Human Retinal and Choroid Tissue

Sourirajan[1,2], K, B.S., OMS I, Lains[2], I, M.D., Ph.D., Mendez[2,3], K, Ph.D., Kang[2], H, M.D., Ph.D., MPH., Bhat[2], R, B.S., Bannerman[2], A, B.A., M2, Wu[2], DM, M.D., Ph.D., Kim[2], IK, M.D., Miller[2], JB, M.D., Vavvas[2], DG, M.D., Ph.D., Lasky-Su[3], J, Sc.D., Miller[2], JW, M.D., Husain[2], D, M.D.

[1]University of New England College of Osteopathic Medicine, Portland, ME, [2]Massachusetts Eye and Ear, Department of Ophthalmology, Harvard Medical School, Boston, MA, [3]Channing Lab, Channing Division of Network Medicine, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, MA

Abstract

Introduction: Metabolomics, the study of metabolites, has been successfully applied to the study of many retinal diseases. Prior work has mostly been conducted using plasma and serum samples. To our knowledge, no prior characterizations of metabolomic profiles of human retinal tissue have been reported. This is crucial to understand how biofluid changes relate to in situ findings. This study aimed to characterize the normal metabolomic profile of donor human retinal tissue samples.

Methods: Prospectively designed cross-sectional study including human donor eyes (n=14) above the age of 50 without any retinal disease that were enucleated within six hours post-mortem. Post anterior segment and corneal button removal, vitreous was collected and the remaining eye cup was transferred to a petri dish. A 6 mm macular and periphery punch were obtained and the remaining retina was separated. For these samples, the neurosensory retina was then separated from retinal pigment epithelium (RPE)/choroid. Color fundus photographs were taken prior to and after the removal of the neural retina. These images were reviewed to ensure the absence of any retinal disease. Serum samples were collected for the same donors. All samples were snap frozen and stored at -80C degrees in vials and were shipped frozen. Non-targeted mass spectrometry analysis was conducted by Metabolon Inc.

Results: A total of 659 metabolites were identified in the retina/choroid tissue samples. Most of them were lipids (53%) and amino acids (21%). The remaining metabolites belonged to nucleotide (7%), carbohydrate (6%), cofactors and vitamins (6%), xenobiotics (3%), peptide (2%), and energy (2%) pathways. The same type of tissue (neurosensory vs RPE/choroid) had a similar metabolomic profile irrespective of location (macula vs periphery). When looking at neurosensory retina vs RPE, the most unique metabolites were 8 dinucleotides to RPE, and 5 lysophospholipids for neurosensory retina. There were 513 metabolites (46.5%) overlapping between the retina/choroid tissue and serum.

Conclusions: To our knowledge, this study presents the first assessment of metabolomic profiles of human retina/choroid tissue. Most of the identified circulating metabolites were also seen in the retina/choroid tissue, thus reaffirming their potential use as biomarkers for retinal disease. Understanding the relationship between circulatory and eye-specific metabolites is crucial for enabling future translational medicine research.

Development of a Case-Based Immunotherapy Curriculum for Dermatologic Oncology Education

Thomas[1,2], A, OMS III, Wisco[2,3], O, D.O.

[1]University of New England College of Osteopathic Medicine, Portland, Maine, [2]Warren Alpert Medical School of Brown University, Department of Dermatology, Providence, Rhode Island
[3]The Wisco Institute, Bend, Oregon

Abstract

Introduction: Immune checkpoint inhibitors (ICIs) have transformed cancer therapy across cutaneous and systemic malignancies. As they become standard of care, safe and effective use requires a thorough understanding of mechanisms and potential complications. Dermatologists play a key role in ICI management of skin cancers and the treatment of cutaneous adverse events (AEs). Despite the increasing complexity of immunotherapies, structured educational resources for physicians remain limited. We hypothesized that development and distribution of a free, comprehensive immunotherapy curriculum would improve clinician understanding and clinical confidence in ICI use. For the first phase of this study, we developed an evidence-based Immuno-Oncology Training Academy (IOTA) to address this gap in dermatology.

Methods: A team of student contributors designed a stepwise immuno-oncology curriculum under dermatologist oversight. Students were assigned topics and paired to develop modules based on predefined learning objectives. Short 2-5 minute, slide-based narrated videos were created to explain each core concept using peer-reviewed literature, US Food and Drug Administration (FDA) and National Comprehensive Cancer Network guidelines, and academic lectures. Each module followed a framework of introduction, objectives, core content, case application, and summary. A standardized slide template was crafted for visual and structural consistency across modules.

Results: The completed curriculum includes 36 modules covering foundational immunology, mechanisms of checkpoint inhibition, FDA-approved ICIs, treatment guidelines, multidisciplinary integration, and identification and management of AEs. The target audience is dermatologists, oncologists, and other healthcare professionals across academic centers, residency programs, and continuing medical education courses. Modules will be open access via a dedicated website and social platforms. The curriculum establishes a foundation for subsequent evaluation of clinician preparedness in ICI use.

Conclusion: By integrating evidence-driven guidelines with case-based learning in an accessible digital format, IOTA addresses the growing demand for standardized immunotherapy education within dermato-oncology. The next phase involves curriculum implementation, with future work potentially evaluating educational outcomes such as user engagement, comprehension of key concepts, and clinical confidence.

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