# 2023 Creighton University Research Week

## *St. Albert's Day*

## Phoenix Regional Campus Booklet

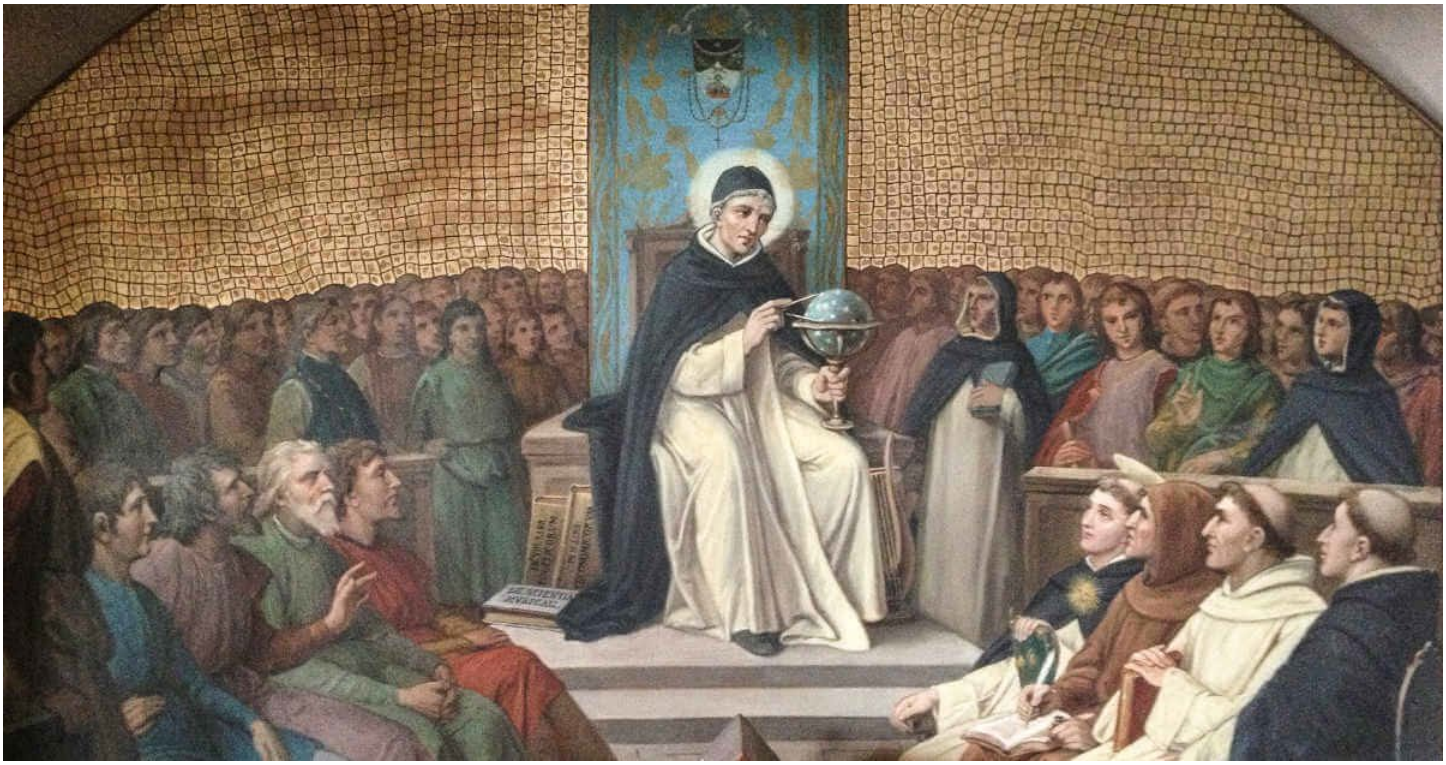
Creighton UNIVERSITY

April 5, 2023

# HISTORY OF ST. ALBERT'S DAY AT CREIGHTON UNIVERSITY

In 1997, faculty from the health science schools, as well as from the College of Arts and Sciences, expressed an interest in promoting the interaction between faculty scientists and students at Creighton University at both the undergraduate and graduate level. A series of discussions resulted in the first St. Albert's Day celebration, which was held on November 24, 1997. Since 1997, the St. Albert's Day poster session has been an annual event at Creighton University. In 2008, the event was expanded to include oral (platform) presentations as well as posters. Awards will be presented for the 'best poster' in three categories, as well as for the 'best presentation.'

St. Albert the Great was born in 1295 or 1296, and as a youth was sent to pursue his studies at the University of Padua. He joined the Order of St. Dominic in 1223. He completed a doctor's degree at the university in Paris, which was celebrated as a school of theology. In 1254 Albert was elected Provincial of his Order in Germany. He resigned this office in 1257 to devote himself to study and to teaching. He was canonized in 1931. He is the patron saint of scientists and was the mentor of St. Thomas Aquinas. He was called the "Doctor Universalis" (Universal Doctor), in recognition of his extraordinary genius and extensive knowledge. He composed a veritable encyclopedia that contained scientific treatises on almost every subject. He was proficient in every branch of learning cultivated in his day, including physics, mathematics and metaphysics, and his writings did not distinguish between the sciences and philosophy.



# 2023 CREIGHTON UNIVERSITY RESEARCH WEEK-ST. ALBERT'S DAY
# SCHEDULE OF EVENTS-(PHOENIX CAMPUS)
# WEDNESDAY, APRIL 5, 2023

**Doris S. Norton Ballroom**

**9:00AM-9:15AM:**
**Welcome by Dr. Randy Richardson,**
Dean for Phoenix Regional Campus

**9:15AM-11:00AM:**
**Poster Presentations**

**11:15AM-1:00PM:**
**Medical Student Luncheon**
**Abstract Award Presentations by**
**Dr. Daniel Gridley,**
Assistant Dean of Clinical Research,
CUSOM-PHX

**Thank you to all our poster judges:**

Wendi Carlton, MD
Manuel Cevallos, MD
Melissa Chambers, DO
Kristina Chapple, PhD
Jeffrey Curtis, MD
Trent Davis, MD
Brenda Gentz, MD
Daniel Gridley, MD
Jill Gualdoni, MD
Moustafa Hazin, DO
Jonna Jackson, PhD
Arpana Jain, MD
Clifford Jones, MD
Juan Kamar, MD
Curtis McKnight, MD
Ana Moran, MD
Alexander Ngwube, MD
Ed Paul, MD
Leena Pawar, MD
Albert Roh, MD
Kristian Schafernak, MD
Jessica Seaman, EdD
Joseph Stapczynaski, MD
Vamsee Torri, MD

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**MEDICAL STUDENT POSTER PRESENTATIONS:**
**9:00-11:00 AM**
**WEDNESDAY, APRIL 5, 2023**
**STUDENT ABSTRACTS**
**(Alphabetical Order by Presenter, Presenter is underlined)**

## *A Rare Case of Extreme Reactive Thrombocytosis*

Ahn, Kevin. Kirsch, John

Extreme thrombocytosis is a rare subset of thrombocytosis in which platelets exceed 1,000,000/microL. We report a case of a 53-year-old man with a past medical history of methamphetamine abuse who developed extreme thrombocytosis in the setting of acute pulmonary embolism and sepsis secondary to cholecystitis. The patient initially presented with shortness of breath and ultimately was admitted due to acute respiratory failure secondary to pneumonia requiring intubation. On initial admission, his platelets ranged from low 300,000-500,000. During his stay, he developed a pulmonary embolus and sepsis likely secondary to cholecystitis, and within 2 weeks of admission, his platelet levels were reaching 1.3 million. The patient also demonstrated normocytic anemia, likely secondary to chronic disease with an iron deficiency component. Bone marrow biopsy was negative for hematologic abnormalities and rearrangements. Hematology was consulted and ruled it likely a reactive thrombocytosis and began the patient on low-dose Aspirin and Apixaban. The patient's platelets dropped below 1 million in the following days, and he eventually was discharged with instructions to follow up with hematology. While thrombocytosis can be a common finding in the hospital setting, extreme thrombocytosis is a rarer finding and should warrant further evaluation. Additionally, higher platelet concentrations can put patients at a higher risk of thrombosis and bleeding due to extreme thrombocytosis. Quick identification of extreme thrombocytosis (and subsequently its cause) can help providers prevent complications due to early intervention with antiplatelet/anticoagulant, and this case highlights the importance of continuing platelet monitoring in the hospital setting.

## *Retroperitoneal Liposarcoma in a patient with constipation and RUQ pain*

Noory, Mukhtar; Noory, Eliace; Alshaka, Saif
Creighton University, Department of Medicine

Although a rare malignancy, liposarcomas are the most common primary malignant tumor of the retroperitoneum. These tumors carry a poor prognosis as they are difficult to manage surgically and respond poorly to chemotherapy. Moreover, local recurrence rates are as high as 43% at 8 years following treatment. A major issue with Retroperitoneal Liposarcomas (RPL) is they are usually asymptomatic until large enough to compress surrounding organs. Our case study will focus on well-differentiated liposarcoma (WDL) as this is the most common subtype. WDL and dedifferentiated liposarcoma (DDL) account for more than 90% of RPLs, with the myxoid and pleomorphic subtypes accounting for the remaining cases. In regard to this case, the patient presented with right upper quadrant pain, constipation, unintentional weight loss, and a soft large palpable mass was noted on exam. CT scan was then ordered to determine size, mass present was measured at 17.2 x 11.6 x 15.9 cm. Needle Biopsy was taken, and a pathology report confirmed diagnosis of well differentiated RPL with MDM2+ mutation, T4N0M0 G1 stage. Patient opted for surgical resection of the tumor; complete resection was performed as confirmed by postoperative imaging. There are multiple etiologies for these tumors and a specific mechanism is yet to be discovered. However, many explanations point to mutations in the tumor suppressor pathway, with certain studies suggesting amplification sequences in the long arm of

chromosome 12 result in massive fragmentation and rearrangement of the chromosome. Due to the asymptomatic nature of RPLs, it is best recommended to order imaging if there is suspicion for liposarcoma, beginning with ultrasound. In conclusion, RPLs are extremely rare tumors that present vaguely, the largest risk following intervention is the high rate of recurrence, with up to a 50% chance in well-differentiated subtypes and even higher risk in rarer subtypes.

***A case of long-term control of Kaposi sarcoma with VMAT, SBRT and HDR brachytherapy***

Badwal, Areen[1], Govardhan, Isheeta[1], Patel, Shyamal., M.D.[2]
Creighton University School of Medicine[1]
St. Joseph's Hospital and Medical Center Department of Radiation Oncology[2]

Kaposi sarcoma (KS) is a vascular tumor that originates from endothelial and immune cells and involves skin, mucosa, and splanchnic organs. The cutaneous lesions of KS appear most often on the lower extremities, face, oral mucosa, and genitalia. We describe the case of a patient with HIV/AIDS who presented with KS of the lower extremity which was treated with volumetric modulated arc therapy (VMAT) followed by stereotactic body radiotherapy (SBRT) and HDR brachytherapy.

A 57-year-old man with a history of HIV/AIDS presented with progressive left lower extremity pain and infection of exophytic lesions with drainage. He had nodules on his left lower leg skin extending to the proximal thigh. Pathological findings were consistent with KS. The patient was started on empiric antibiotic treatment. Surgery was consulted for debridement and possible amputation. Radiation oncology was consulted for palliative radiation treatment. The patient received radiation of 20 Gy in 5 fractions and had a significant response by the end of the treatment course. Years later, the patient presented with lesions that extended to the sole of the foot and superior to the previously irradiated portion to the upper thigh. He received HDR brachytherapy for recurrent lesions to the sole of the foot and upper thigh, and reirradiation to the lower thigh. The lesions stabilized and there was no recurrence in previously treated areas.

Radiation therapy was used to treat extensive KS that was not able to be treated with other strategies such as intralesional chemotherapy. Given the circumferential involvement around the ankle and significant involvement of the leg, limited treatment options were available for addressing the lesions. Surgical treatment included amputation, decreasing quality of life. This case highlights the importance of use of radiation therapy in KS when local chemotherapy or surgical treatment are not possible or provide significant morbidity.

***Thyroid Carcinoma Showing Thymus-Like Element: A National Analysis of Demographic Features***

Bitar, Gabriel; Hsia, Beau; Wu, Xinxin; Silberstein, Peter; Keirns, Darby

**Abstract:** Thyroid carcinoma showing thymus-like elements, otherwise known as CASTLE, is a rare and indolent cancer that is thought to arise from ectopic thymus tissue or remnants of the branchial pouches and affecting the thyroid. It is estimated to account for less than 0.1-0.15 % of all thyroid carcinoma, with a total of only 50 cases reported in the English literature. CASTLE is typically diagnosed in middle-aged adults, with an average age at diagnosis of around 50 years. It is slightly more common in females than males with an occurrence ratio of 1.3: 1.
Thyroid Carcinoma Showing Thymus-Like Differentiation has been reportedly treated by

radiotherapy and/or neck dissection. CASTLE has a 5- and 10-year survival rate of 90% and 82% with curative surgery with neck dissection. However, given the fact there is no standard treatment algorithm for this neoplasm, a study on the treatment patterns, epidemiology, and risk factors could offer valuable insight in the treatment of the disease. No significant study on thyroid carcinoma showing thymus-like elements has been done using data from the National Cancer Database (NCDB) or Surveillance Epidemiology and End Results (SEER). However, a case series study by Gao et al., looked retrospectively at 26 CASTLE patients and analyzed data from a cross-database literature search. The data analysis collected and statistically analyzed data pertaining to clinical stages, treatment regimens, and survival time. A data analysis study has yet to be done that explores the impact of race, insurance status, education level, facility type, rural/urban geography, and income level on the risk factors for the cancer, the treatment the patients were more likely to receive based on different variables, and the outcome disparity between socioeconomic groups.

### *A Prospective Analysis of Factors Contributing to Discharge Delays at a Level 1 Trauma Center*

Brown, Landon; Weinberg, Jordan; Chapple, Kristina

**Abstract:** Achieving cost-effective, quality trauma care demands synergy from multiple interconnected parties and processes. A critical convergence point, requiring multiple successes from several processes, is patient discharge from a trauma center. When communication breaks down or a single process fails, the consequences include potentially steep financial losses and compromised patient outcomes. The purpose of this study was to prospectively evaluate the key factors associated in discharge delays at a level 1 trauma center. For two months, all patients admitted to our level 1 trauma center were prospectively evaluated to elucidate delays in the discharge process after medical clearance was given. A compelling number of our patients experienced a delay in discharge. For these patients, we evaluated age, sex, race/ethnicity, insurance status, housing status and discharge destination to determine which factors keep patients in the hospital. In this prospective study we were able to gain a greater understanding of the complications that result in significant reduction in profits for trauma centers and poorer outcomes of care for patients. The data obtained provided information that is shaping our future exploration into the significant factors that create barriers to patients leaving the hospital.

### *The Developing Field of Spino-Plastic Surgery: Overview of Novel Vascularized-Bone Graft Techniques*

Buchanan, Dylon MS [1]; Shvedova, Maria MD [2]; Reece, Edward MD, MS [2]
[1] Creighton University School of Medicine – Phoenix Campus
[2] Department of Plastic and Reconstructive Surgery, The Mayo Clinic Arizona

**Abstract:** Spinal reconstructive surgery can represent substantial challenge in patients with risk factors for complications. Plastic Surgeon involvement has proven to be beneficial in spinal reconstruction, especially when complex closure is required. Despite multiple techniques involving auto- and allograft options, the complication rate in patients with risk factors is still substantial and there has been an unmet need for additional approaches. For patients at risk of improper bony healing, the advent of muscle pedicled-vascularized bone grafts has shown to be a promising option which adds little operation time and vastly improves patient outcomes. These pedicled-VBGs help promote bony fusion and decrease

risk of complications through the delivery of blood and nutrients to the operative site. This evolving approach can be applied at cervical, thoracic, and lumbar spine regions utilizing vascularized muscle pedicled bone grafts. Techniques utilizing occipital, clavicular, scapular, spinous process, rib, iliac crest, and posterior element pedicled vascularized bone grafts have been developed to improve spinal reconstruction outcomes. This project provides an overview of existing spinal reconstructive options with particular attention to the newly developed vascularized muscle pedicled bone graft techniques for an invited publication in Seminars in Plastic Surgery.

### ***COVID19 Prevention in Schools- The Role of Adapting Policies to an Ever-Changing Virus***

Casper, Caroline; Cevallos, Nicolas M.; Moran, Ana
Creighton University School of Medicine

**Abstract:** In the early weeks of the COVID19 pandemic, most U.S. schools closed to in-person instruction to prevent the spread of SARS-CoV-2. In March 2020, all schools in Arizona (AZ) moved to virtual instruction. Brophy College Preparatory (BCP) is an all-male school, from grades 6$^{th}$ to 12$^{th}$, with a total population of 1563 students and staff. In August 2020, BCP opened for in-person learning using evidence-based mitigation measures (COVID19 protocol) to limit the transmission of SARS-CoV-2. A team of physicians, epidemiologists, and educators reviewed the available scientific evidence and created the COVID19 protocol in the summer 2020. Total cases in the school were as follows: Fall 20-21, 80 cases; Spring 20-21, 67; Fall 21-22, 161; Spring 21-22, 238. During the Omicron surge, the frequency of infections among vaccinated and unvaccinated individuals was not significantly different. The number of cases in vaccinated individuals was 5-times higher during the Omicron surge than during the Delta surge (Chi square test, $p< 0.001$). Rates of infection at BCP closely mirrored those of the larger community and matched peaks that occurred in the larger Maricopa community, though at a rate that was 10x lower. During the time-period where Delta was the dominant variant, vaccinated individuals were less likely to become infected than unvaccinated individuals. This suggests that vaccination decreased the likelihood of infection with Delta variant, consistent with wider infection trends. Infection rates between vaccinated and unvaccinated individuals was similar during the Omicron surge. Vaccinated individuals were more likely to become infected during the Omicron surge compared to the Delta surge. Constant evaluation of the epidemiological conditions in the community, the viral mutations, and their role in response to vaccination allowed for a regular revision and adjustment of our policies, which resulted in an overall safe school environment with minimal viral transmission at school.

### ***T1rho Dispersion in Proteoglycan-depleted Swine Spine Disc***

Mitchell J Christiansen[1,2], Mark Preul[3], Jay D. Turner[4], Juan Uribe[4], Muhammad Nadeem[5], Elliott Mufson[5], Richard D. Dortch[1,5], John C. Gore[6], Ping Wang[1,5]
[1]Neuroimaging Innovation Center, Barrow Neurological Institute; [2]Creighton University School of Medicine; [3]Department of Neurosurgery, Barrow Neurological Institute
; [4]Sonntag Spine Center, Barrow Neurological Institute; [5]Department of Translational Neuroscience, Barrow Neurological Institute; [6]Vanderbilt University Institute of Imaging Science

**Abstract:** Degenerative disc disease (DDD) is a common cause of low back pain. It is known that biochemical changes occur early in the disease course of DDD, but these changes are unable to be seen with conventional imaging. T1rho imaging has the potential to probe for the slow macromolecular changes associated with early DDD, namely the loss of proteoglycan content in the nucleus pulposus. Previous research has shown that at higher static fields (3T or greater) T1rho is strongly influenced by chemical exchange

processes. We investigated the T1rho dispersion in fresh swine disc specimens before and after they were treated with Trypsin to induce proteoglycan loss with an aim to assess the sensitivity of using T1rho to detect low back pain. Treatment consisted of injecting 0.1mL Trypsin into the nucleus pulposus of each specimen using a 27G needle. Experiments were performed on a 3T scanner at five different spin-lock times (TSLs) in a single scan for T1rho calculation. The T1rho experiment was repeated at different spin-lock frequencies (FSLs) to evaluate T1rho dispersion in discs pre- and post-treatment. The results showed elevated T1rho values in all proteoglycan-depleted discs at each spin-lock field, and overall, the T1rho changes after the treatment increase at higher spin-lock field. Our findings indicate that T1rho values have the potential to reliably assess the proteoglycan content of intervertebral discs and identify DDD early in its disease course. Greater spin-lock frequencies may be more beneficial to detect changes associated with proteoglycan loss. More work is needed to utilize T1rho dispersion to characterize tissue composition and physicochemical changes.

### *Utilization and Reimbursement Trends for Transbronchial Biopsy and Needle Aspiration Procedures from 2000-2019: A Retrospective Analysis*

Creech, Zachary A.[1]; Truong, Gia Thinh D[1]; Adeleye, Olufunmilola[2]; Merill, Matthew S.[1]
[1]Creighton University School of Medicine, Phoenix, AZ
[2]Mayo Clinic Alix School of Medicine, Scottsdale, AZ

**Background:** The detection and diagnostic workup of pulmonary nodules and masses has become more prevalent because of the increasing sensitivity of imaging techniques. The objective of this study was to evaluate the clinical utilization and reimbursement trends of pulmonary diagnostic procedures, specifically transbronchial lung biopsies and needles aspirations, in the Medicare population from 2000 to 2019.
**Methods:** Using the Medicare Part B National Summary Data Files from 2000 to 2019, a retrospective analysis was conducted. Current Procedural Terminology codes for transbronchial lung biopsies of a single lobe and transbronchial needle aspiration biopsy (31628, 31629) were analyzed. The total volume and actual physician reimbursements for transbronchial lung biopsies of a single lobe and needle aspirations were compiled. Inflation adjustments were made for fiscal year.
**Results:** From 2000 to 2019, a total of 828,529 transbronchial bronchoscopies and 319,355 transbronchial needle aspirations were performed on the U.S. Medicare Part B population. The volume of transbronchial lung biopsy procedures of a single lobe has declined by an average of 1.82% per year, whereas the volume of transbronchial needle aspirations has increased by 4.82% annually. Physicians were reimbursed a total of $117,197,089 for transbronchial lung biopsies and $47,479,076,26 for needle aspiration biopsies from 2000- 2019. After adjusting for inflation, the mean transbronchial lung biopsy reimbursement decreased from 2000-2019 by $174.67 (-91.8%), whereas needle aspiration reimbursement decreased by $97.97 (-45.23%).
**Conclusion:** To our knowledge, this is the first study to examine the clinical utilization and reimbursement patterns for common lung biopsy procedures in the Medicare population. Results suggest an increasing trend in transbronchial needle aspirations and a decrease in transbronchial lung biopsies during the study period. Medicare reimbursement for transbronchial procedures has steadily decreased from 2000 to 2019. These findings reveal changes in the reimbursement and clinical utility of pulmonary diagnostic procedures within the U.S.

## *The diagnosis and treatment of tonsillar Kaposi's sarcoma in a young adult with HIV*

del Rosario, Stefania[1]; Howshar, Jacob[2]; Momchev, Christina MD[3]; Curley, Natalie DO[3]; Kest, Daren DO[3,4]
[1]Creighton University School of Medicine – Phoenix Regional Campus; [2]University of Arizona College of Medicine-Phoenix; [3]Creighton University Surgery; [4]ENT/Head & Neck Surgery, Valleywise Health/District Medical Group

**Background:** Kaposi's sarcoma is a malignant endothelial tumor caused by human herpesvirus 8 infection in the setting of immunosuppression. It is the most common cancer in patients with untreated HIV and is considered an AIDS-defining illness. It most commonly presents as multifocal cutaneous macules or nodules that are violaceous or brown in color. Kaposi's sarcoma has a predilection for the lower extremities. However, oral involvement may also be seen, most commonly affecting the hard palate, gingiva, and tongue. Kaposi's sarcoma of the tonsils is extremely rare with only a handful of cases reported in the literature.

**Case Description:** A 20-year-old male with a past medical history of untreated HIV and polysubstance abuse presented with four months of worsening sore throat with associated dysphagia, dysarthria, and difficulty breathing. Rapid Strep A PCR test was positive and empiric treatment with ampicillin/sulbactam was initiated. He initially responded to treatment, but on hospital day 5, he experienced acute respiratory distress secondary to obstruction from worsening tonsillitis. He was emergently taken to the operating room for awake tracheostomy and tonsillectomy. Diffuse lymphoid hyperplasia involving the entirety of Waldeyer's ring with areas of tissue necrosis was noted. The palatine tonsils were debulked and pathology demonstrated Kaposi's sarcoma. In collaboration with infectious disease and oncology specialists, plans for outpatient chemotherapy and highly active antiretroviral therapy (HAART) were established.
**Conclusion:** In immunocompromised patients presenting with signs and symptoms of oropharyngeal infection, Kaposi's sarcoma is a rare, but important, component of the differential diagnoses. In HIV-positive patients with visceral involvement, the best treatment is a combination of HAART, chemotherapy, and surgical excision when possible.

## *Vasospasm, Delayed Cerebral Ischemia, and Clinical Outcomes Following Aneurysmal Subarachnoid Hemorrhage*

Devine, Gregory[1]; Catapano, Joshua[2]; Jadhav, Ashutosh[2]; Lawton, Michael[2]; Albuquerque, Felipe[2]; Ducruet, Andrew[2]
[1]Creighton University School of Medicine, Phoenix, Arizona, USA
[2]Department of Neurosurgery, Barrow Neurological Institute, Phoenix, Arizona, USA

**Background:** Vasospasm and subsequent delayed cerebral ischemia (DCI) contribute to morbidity and mortality following aneurysmal subarachnoid hemorrhage (SAH). The association between vascular territory of vasospasm, as well as vasospasm severity, and the development of DCI warrants further investigation. This study evaluates the relationship between vasospasm territory, severity, DCI, and function outcomes after SAH.
**Methods:** A retrospective analysis of a prospective, intention-to-treat trial for aneurysmal SAH was performed. Angiographic imaging reports were used to determine vasospasm severity and vascular territory. DCI was identified from CT angiography and MRI reports. Modified Rankin scale (mRS) outcomes were assessed at 6 months following aneurysm rupture. A poor functional outcome was defined as a mRS > 2.
**Results:** A total of 442 patients were included, 245 of which experienced vasospasm. Vasospasm of the anterior cerebral artery (ACA), middle cerebral artery (MCA), posterior cerebral artery (PCA), and internal carotid artery (ICA) was associated with the

development of DCI ($p < 0.005$). Vasospasm of the vertebral artery was not associated with DCI (OR 1.729; 95% CI 0.892 to 3.350; $p = 0.101$). Vasospasm severity had a medium sized effect on DCI [$F (3, 438) = 12.134$, $p < 0.001$, $\eta 2 = .077$). DCI was associated with a poor functional outcome (OR, 1.597; 95% CI 1.048 to 2.434, $p < 0.05$); however, vasospasm was not (OR, 1.039; 95% CI 0.714 to 1.513, $p = 0.842$). Vasospasm severity had no effect on hospital length of stay [$F (3, 267) = 1.107$, $p = 0.347$] or mRS at 6 months [$F (3, 438) = 0.792$, $p = 0.499$].
**Conclusions:** In aneurysmal SAH, vasospasm of the ACA, MCA, PCA, and ICA is associated with DCI. While vasospasm severity is not directly related to functional outcome, the development of DCI is associated with unfavorable functional status.

### *A Literature Review: Humor in Healthcare Education…How We Think We're Funny and Should We Be Funnier?*

Clarice Douille, Jessica Seaman, EdD - Creighton University School of Medicine

Humor in medical education has benefits when used intentionally between learners, patients, teachers in both classrooms and clinics; however, healthcare practitioners should recognize the potentially negative effects of humor. More medical professionals should become aware of harm that may result from inappropriate humor, their own use of humor, and model humor for physicians in training. This literature review focuses on what we learn from humor in nursing, socialization of physicians, the need for embracing humor, and implications of callous humor.
Nursing education uses humor as an effective teaching method and acknowledges benefits of laughter, storytelling, comics, and prose in lectures, engaging students, and encouraging connections with patients. Research shows medical learners could benefit from humor in classrooms, reducing anxiety, increasing enjoyment, and extending material retention. Used appropriately with patients, humor elicits information, eases tensions, and builds trust, cultivating a positive environment.
Historically, humor was significant in socializing physician trainees. Students learned their place at the bottom of medicine's hierarchy, but humor lessened rigidity, creating a dynamic relationship between teacher and learner, where senior physicians became more approachable. Contemporary literature echoes the past, emphasizing medical students are shaped by senior leaders modeling what it means to be a doctor. If teachers use humor in derogatory ways, it can be normalized for students, thus physicians must intentionally use humor, giving learners space to reflect and process difficult clinical experiences, rather than perpetuating the use of derogatory humor as a means to avoid suffering.

The literature leads us to the need for more focused research through the medical humanities, encouraging physicians and educators to use appropriate humor. It will in turn, build stronger connections with learners, remind students of reasons they came into medicine, and create a positive healthcare environment for patients.

### *Hinman Syndrome: A review of non-neurogenic neurogenic bladder in the pediatric population*

Julia Drexelius, Joan C. Delto MD
Creighton University School of Medicine, Department of Urology

**Background:** Hinman Syndrome (HS) is a rare pediatric disease characterized by bladder dysfunction mimicking neurogenic disease without neurologic findings. Thought to be caused by behavioral and psychological issues, HS leads to dysfunctional voiding and subsequent physical changes resulting in true neurogenic bladder. Patients may have

incomplete bladder emptying and urinary incontinence, leading to recurrent urinary tract infection (UTI) and urinary tract deterioration. The purpose of this review is to summarize the limited research on this rare syndrome.
**Methods:** A literature review was conducted to evaluate and synthesize research on HS in order to summarize current knowledge of the disease as well as recent research developments. Key words included “Hinman Syndrome” and “nonneurogenic neurogenic bladder”.
**Results:** HS is often diagnosed concomitantly in patients prone to voiding difficulties, such as autism spectrum disorder. Recent case studies have suggested an association with nephrogenic diabetes insipidus. Evaluation incorporates voiding records, voiding score surveys, cystoscopy, and imaging studies including renal bladder ultrasound, voiding cystourethrogram, and video urodynamics. Treatment options include pelvic floor physical therapy, biofeedback, timed voiding, and clean intermittent catheterization. Pharmacotherapy options are limited due to insufficient research on the efficacy of these drugs in the pediatric population; however, anticholinergics may be used for incontinence and alpha-blockers may facilitate bladder emptying. Recent studies have suggested that intravesical botulinum toxin injection may reduce incidence of UTI.
**Conclusion:** Early detection, evaluation, and urologic management is essential to prevent progression of HS and its damaging outcomes. Increased research efforts and case reports would improve knowledge and awareness of the disease in the medical community. The development of a screening tool that identifies children at risk for the disease and its sequalae would be useful for early identification and intervention.

***A case of recurrence of unresectable retroperitoneal ganglioneuroma treated with Stereotactic Body Radiation Therapy***

Govardhan, Isheeta[1], Badwal, Areen[1], Patel, Shaymal., M.D.[2]
Creighton University School of Medicine[1], St. Joseph’s Hospital and Medical Center Department of Radiation Oncology[2]

Neuroblastic tumors (NT) are the most common extracranial solid tumors in childhood and include neuroblastoma, ganglioneuroblastoma and ganglioneuroma. They arise from the great sympathetic chains. Classically, surgery is considered the only curative treatment for ganglioneuroma. Notably, stereotactic body radiotherapy (SBRT) has not previously been used for treatment of ganglioneuroma. Here, we present a case of a 35-year-old male with a recurrent unresectable retroperitoneal ganglioneuroma that was successfully treated with SBRT.

A 35-year-old male with a past medical history of ganglioneuroma in childhood presented with abdominal pain and intractable vomiting. The patient presented with symptoms of abdominal bloating, exacerbated by eating and was diagnosed with small bowel obstruction. He was diagnosed with a ganglioneuroma at 18 months old that was subsequently surgically resected. He had a recurrence at 4 years old, which warranted repeat surgical resection. Upon imaging, CT scan demonstrated possible SBO with retroperitoneal mass 8x1x8 cm. Biopsy of the mass confirmed recurrence of ganglioneuroma. The tumor was determined to be surgically unresectable. He received SBRT of 8 Gy x 5 courses and tolerated treatment well without any major toxicities. The tumor remained stable, and the patient did not have any symptoms due to the residual mass.

This case highlights the use of SBRT in a patient with recurrence of unresectable ganglioneuroma. This case shows the benefits of SBRT to retroperitoneal ganglioneuroma

leading to resolution of obstructive symptoms and tumor to remain stable. Additionally, we emphasize the importance of a multidisciplinary approach which includes radiation therapy to aid in patient management in the setting that surgery may not benefit the patient.

***How well do our students match? An analysis of Creighton University School of Medicine match performance: Omaha and Phoenix campuses***

Han, Emily; Lam, Matthew
Creighton University, Department of Medicine

**Introduction:** Creighton's medical school campuses in Omaha (OMA) and Phoenix (PRC) aim to equally prepare students to be successful in the National Residency Matching Program (NRMP). However, some members of the Creighton Community believe that PRC students match more competitively than their OMA counterparts. The two campuses have a shared vision but some distinct offerings due to geographic location. In this study, we examined whether there is a statistically significant difference in matching competitiveness between the two campuses.
**Methods:** Match data for the two campuses was obtained through the publicly available match lists and student rosters on the Creighton website. US MD senior fill rate was used as a metric of competitiveness as the NRMP considers this to be a representative metric [1]. Information regarding the US MD senior fill rate of residency programs was obtained from the NRMP "Results and Data" residency match data sheets for the years 2014-2022. Data for ophthalmology and urology were obtained from the San Francisco match and American Urological Association websites, respectively. US MD senior fill rate for urology was not available in 2014, so the rate from 2015 was used as a substitute. Students who did not match were omitted. Students who matched into a Transitional Year were omitted as their final specialties were unclear. Due to a lack of complete data, students who matched into Preliminary Medicine and Preliminary Surgery were considered to have matched into Internal Medicine and Surgery (Categorical), respectively.
**Results:** For each year, the overall competitiveness of each campus was determined as follows. US MD senior fill rate of the given specialties was considered the "competitive index" of that specialty. Each student was assigned the competitive index that corresponded with the specialty of the residency in which they matched and the year in which they matched, representing the overall competitiveness of that specialty in that year. Then, for each year, the competitive indices of all students graduating from each campus was averaged, providing an overall competitive index for each campus for each year. A 2-tailed t-test with a significance level of 0.05 was performed to determine whether differences in competitive indices of the two campuses were statistically significant for each year. Each year, the competitive indices of OMA and PRC campus matches were found to be not statistically different from each other. Most years, PRC tended to have higher competitive indices than OMA.
**Discussion:** A medical school's match performance is one metric that can be analyzed to assess the success of its students. A lack of a significant difference in results may be due to the campuses' similar student bodies given the common stated mission. The study has several key limitations, however. First, it does not address factors such as individual perspectives that would indicate how successful individual students feel about their match. Also, a more robust study would examine trends of the quality of programs. Nonetheless, at both campuses, our data can provide insight relevant to staff and faculty development in the context of residency and career advising.
**References:**
[1] Murphy, Brendan. "Residency Match: The 7 Most Competitive Medical Specialties." *American Medical Association*, 21 Nov. 2018, https://www.ama-assn.org/medical-

students/specialty-profiles/residency-match-7-most-competitive-medical-specialties.

***Investigating the Impact of Demographic and Socioeconomic Factors on the Incidence of Head and Neck Cribriform Carcinoma***

Harirchian, Shervin; Laura Stewart; Anthony M. Rossi; Beau Hsia; Xinxin Wu; Darby Keirns; Silberstein, Peter, MD
Creighton University, Department of Hematology and Oncology

**Background:** Head and neck cribriform carcinoma, not otherwise specified (HNCC) is a type of cancer that develops from the epithelial cells lining the head and neck area. It is identified histologically by the presence of cribriform (sieve-like) patterns in the tumor cells. Although rare, HNCC has a significant impact on patient outcomes, with 35% mortality within five years of diagnosis. A study utilizing data from the National Cancer Database (NCDB) was conducted to investigate the demographic factors associated with HNCC.
**Methods:** A retrospective cohort analysis utilizing the 2004 – 2020 NCDB included patients with a histologically-confirmed diagnosis of HNCC (N = 131). The study examined demographic factors in patients diagnosed with HNCC: sex, race, Hispanic status, and Charlson-Deyo score. Descriptive statistical analysis was performed on these factors. Trends in incidence were evaluated using regression analysis.
**Results:** A total of 131 patients were identified in the database with a confirmed diagnosis of HNCC between 2004 and 2020 with a steady incidence of patients diagnosed per year ($R^2$ = 0.148). The majority of patients were females (66.4%). The most common primary site was the parotid gland (19.8%). Most individuals (82.4%) had Charlson-Deyo comorbidity scores of 0. The majority of the patients were Non-Hispanic White (93.1%) and were in the top quartile of income earners (38.8%). Finally, the majority of patients lived in major urban areas with a population of greater than 1 million (57.4%).
**Conclusions:** This NCDB analysis of HNCC provides valuable insight into a previously underexplored area. The results revealed that HNCC patients tend to be in the top quartile of income earners, reside in densely populated metropolitan areas, and identify as non-Hispanic White. However, further research is required to fully comprehend the impact of these demographic and socioeconomic factors on the diagnosis, treatment, and prognosis of HNCC patients.

***Characterization of anti-fibrotic drug-eluting nanocrystal formulation***

Hunt, Kelton; Del Sesto, Rico; Josyula, Aditya; Ensign, Laura; Shapiro, Rachel
Utah Tech University, Department of Physical Science/Chemistry.
Johns Hopkins University, Nanomedicine Division.
Creighton University, School of Medicine

**Background & purpose:**
Scarring of tissues (fibrosis) is due to a wound healing process involving the laying down of collagen fibers, fibronectin, and other extra cellular matrix components. These are produced by cells such as myofibroblasts, fibroblasts and others. Fibrosis within the gastrointestinal (GI) tract causes narrowing of the lumen and stricture formation. Developing a drug treatment with a sustained release to prevent these strictures would have a profound impact on patient care. The physical structure of drug formulations determines the rate of release of the drug into the surrounding tissue. More crystalline structures tend to be released slowly while more amorphous structures release more rapidly. In developing a drug formulation to combat GI stricture and fibrosis, the ideal crystallinity would lead to a sustained release to avoid the need for frequent future injections. Our aim is to characterize the crystallinity of a sulconazole nanocrystal (Sul-NC)

formulation which was found to have anti-fibrotic properties in animal models. Determination of this physical property will increase our understanding of the release of the drug after local injection.
**Methods:** Differential scanning calorimetry (DSC) was performed to investigate the heat flow of the Sul-NC formulation and assist in determining crystallinity. This was compared to results from previous X-Ray diffraction studies done on the Sul-NC formulation.
**Results:** DSC energy absorption and release data showed raw sulconazole and Sul-NC formulation melting points that suggest crystalline structure. Immediately after melting, data showed decomposition of raw sulconazole and the Sul-NC formulation evident by absent phase transition upon cooling. Comparing DSC data to the X-Ray diffraction studies suggest crystallinity.
**Conclusion:** The data suggests that Sul-NC was not chemically modified during the formulation process and likely microcrystalline based on melting enthalpy. Future studies should be designed and performed to work around decomposition for more accurate characterization

## ***Stepping up to the Plate: Pre-Clinical Medical Students Rapidly Gain Procedural Proficiency with Intentional Training on High-Fidelity Whole-Body Donor Simulation Platform***

Imam, Tahrin, BS; Parenteau, Emma, BS; Soe-Lin, Hahn, MD, MS; Mahrer, Mikaela, BS; Mankin, Angela, BS; Olney, Ceili, BS; Gray, Kayla, MS, CCRP; Chapple, Kristina, PhD.; Mankin, Jim, MD; Bogert, James, MD; Weinberg, Jordan, MD
Creighton University School of Medicine - Phoenix Campus, Department of Trauma Surgery

**Abstract:**
Lack of proficiency with procedural skills is often a barrier to medical students participating in the care of patients in the trauma bay. Enhanced training can lead to improved and effective student participation and engagement during a high acuity trauma resuscitation. In this study, we aimed to train medical students (MS) using high fidelity, deceased whole body donors (WBD) preserved with a non-formaldehyde preservation solution. Combining repetitive, intentional training with high fidelity WBDs, this pilot study aims to accelerate the time to competency for early trainees engaging in endotracheal intubation and Foley catheter placement.
Second year MS (MS2) were provided with instructional guides, videos, and in-person demonstrations on both mannequins and WBDs. Students then completed a series of 3 intubation and 3 Foley placement attempts (2 female and 1 male donors). The primary outcome measured was procedural competency and time to completion by an experienced proctor. Secondary outcomes measured self-reported confidence.
9 MS2s completed intubations and 10 MS2s completed Foley placements. 13/27 intubations and 16/30 Foley placements were graded as proficient. The majority of failures were not verbalizing appropriate steps and sterility. Of the failures, 8 of 9 intubations and 6 of 8 Foleys did not repeat the same mistakes. Time (in minutes) to complete intubation (2.8, 2.2, 1.5; P<.001) and Foley placement (8.2, 6.8, 6.0; P<.001) decreased significantly after each repetition. Participating MS2s reported increased confidence in procedural competency following the simulation exercise.
We demonstrate that novice learners can achieve competency on intubation and Foley placement with few repetitions by incorporating intentional clustered practice on a high fidelity WBD training platform.

## *SARS-CoV-2 prevalence in a delivering population: refugee status, payor type, race, and vaccination status*

Johnston, Eleanor, BS; Bhattarai, Bikash, PhD; Johnson-Agbakwu, Crista, MD; Coonrod, Dean, MD
Creighton University, Department of OB/GYN

**Introduction:** The study aim was to evaluate the PCR-based prevalence of SARS-CoV-2 in a delivering population from early to late pandemic by refugee status, ethnicity, insurance, and vaccination status.
**Methods:** A longitudinal cross-sectional study examined parturient patients admitted to an urban safety-net hospital from May 2020 to May 2022 tested for SARS-CoV-2 on admission. Percentages and prevalence ratios (PR) of SARS-CoV-2 between refugee status, insurance type, vaccination status, and race/ethnicity, across the surge periods for the 4 variants were calculated.
**Results:** 3,518 patients delivered, 479 (13.6%) were refugee. Self-pay (39.8%) and Medicaid (36.1%) were the most frequent insurance types with Hispanic predominance (64.38%) by race/ethnicity. Only 12.8% of patients had received at least one vaccine before delivery: 13.2% in non-refugees versus 10.4% refugees.
192 (5.6%) of the mothers tested positive during the study period with 6.1% refugees positive versus 5.4% among non-refugees, PR 1.13 (P=0.536). Positive tests ranged between 4.5% and 6.1% across the insurance types and between 4.4% and 7.5% across race/ethnicity categories. The highest PR (refugee/non-refugee) of 2.0 (P=0.12) was during the Delta Surge and lowest PR of 0.6 (P=0.21) during the Omicron Surge. Among refugees when examined by primary language, 55% of positive tests were from those speaking languages of the Africa Great Lakes region.
**Conclusion/Implications:** We observed only small differences in SARS-CoV-2 positivity between refugee and non-refugees or in vaccination status. Variations in PR were seen by refugee status by variant surge. Subsets of the refugee population when grouped by language/region appeared to be more affected.

## *Multifactorial Hyponatremia: Don't Miss Malignancy*

Darby Keirns[1], Alyssa Krautbauer[2], Diana Zamora MD[3], Mark MacElwee MD[3]
[1]Creighton University School of Medicine, Phoenix, AZ
[2]Midwestern University College of Osteopathic Medicine, Glendale, AZ
[3]Department of Internal Medicine, Creighton University School of Medicine, Phoenix, AZ

**Abstract:**
Hyponatremia is a common condition with a vast differential. In the diagnostic evaluation, it is important to consider the possibility of a multifactorial etiology.

A 62-year-old male with a history of COPD, schizoaffective disorder treated with Zoloft, and diabetes presented after routine labs demonstrated hyponatremia. His history revealed a smoking history and recent increase in free water intake. On physical exam, he had diffuse wheezing and appeared euvolemic. Initial labs were significant for hyponatremia (123 mEq/L), low serum osmolality (266 mosmol/kg), hyperglycemia (171 mg/dL), and urine sodium of 24 mEq/L. Chart review revealed chronic hyponatremia. Given the lab and exam findings, this patient was determined to have a true, euvolemic hyponatremia with a differential including polydipsia, SIADH, malignancy, medications, hypothyroidism, or glucocorticoid deficiency, among others. Further workup including TSH, cortisol level, and urine drug screen was negative. Given the increased free water intake, polydipsia was a likely contributor and water restriction was begun. Additionally, Zoloft was discontinued as a potential cause of SIADH. Although polydipsia and SIADH were reasonable explanations,

malignancy was not ruled out. Given his smoking history, our team felt it important to further investigate with chest CT, the results of which suggested a diffuse and invasive type of adenocarcinoma with lymphangitic carcinomatosis. Ultimately, with fluid restriction and salt tablets, his sodium returned to his baseline, and he was started on Abilify to replace Zoloft. He was discharged with arrangements for outpatient care based on pulmonology recommendations for his recently discovered malignancy.
This case illustrates the importance of considering a broad and multifactorial differential for hyponatremia. Concluding that this patient's hyponatremia was from medication and polydipsia solely would have stopped further workup and resulted in a missed diagnosis of cancer. If there is a risk for malignancy, such as smoking history, it is wise to consider further investigation.

## ***Implementation of a Peer-led Transition-to-Clerkship Curriculum to Prepare Second-Year Medical Students for Rotating in Pediatrics***

Kelley, Caitlin, BS[1]; Tran, Paul, MD[2]
1 Creighton University, Department of Medicine
2 Phoenix Children's Hospital, Department of Pediatric Gastroenterology

**Abstract:**
**Intro:** The transition from pre-clerkships to clerkships in undergraduate medical education is often perceived by students as challenging and anxiety-inducing. Medical programs have attempted to ease this transition through establishing transition-to-clerkship (TTC) curricula which address gaps in student clinical knowledge primarily through seminars, clinical-skills training, and problem-based learning. TTC courses that use near-peer teaching (NPT), led by senior medical students, have proven to increase student preparedness and self-efficacy in clerkships. Despite the success in employing general TTC training, medical programs have not implemented and measured the effectiveness of peer led TTC courses tailored towards specific clerkships such as pediatrics. Due to significant differences in medical management and patient care in pediatrics, there is a need to assess whether pediatrics-specific NPT training will improve student preparedness for that clerkship.
**Objective:** The goal of our project is to develop, implement, and evaluate a peer-led TTC curriculum to prepare second-year medical students at Creighton University School of Medicine (CUSOM) for their pediatrics clerkship.
**Methods:** We will use data from a local needs assessment survey, literature review of current TTC curricula, and input from pediatric clerkship directors at CUSOM to determine the teaching objectives for the pediatrics TTC course and guide curriculum development. Second-year medical students will receive virtual instructional videos, presentations, and resources aligned with the teaching objectives as prework. Third and fourth-year student volunteers will then be incorporated into the course as near-peer instructors and lead two, in-person sessions where students will practice clinical skills, receive feedback, and participate in group discussions. The impact of the TTC course will be measured by providing pre- and post-course surveys to the student learners.
**Expected Results:** We hypothesize that the post-course survey results will indicate improved student preparedness for the pediatrics clerkship at CUSOM compared to the pre-course survey results.

## *Introspective Racial Disparity Assessment: Timing for Biologics Initiation Among Inflammatory Bowel Disease Patients at a Safety Net Health System*

Kim, Peter; Ilo, Chinonso; Scholtens, Ashley; Kaalekahi, Jodie; Davis, Kjersten; Wang, Danlu; Weinberg, Andrew; Srinivasan, Indu; Chuang, Keng-Yu
Creighton University, Department of Gastroenterology
Creighton University, Department of Internal Medicine
Valleywise Health Medical Center

**Introduction:** Eliminating racial disparities in healthcare requires practitioners to acknowledge patient-associated challenges and unconscious bias. To effectively care for uninsured or underinsured patients with inflammatory bowel disease (IBD), practitioners often need to labor through insurance paperwork for prior authorizations to prescribe expensive biologics. In this retrospective study, we aim to analyze biologics initiation timing and prescription pattern among our GI providers at Valleywise Health, the safety net health system in Phoenix to determine whether racial disparities exist so that we could take steps to improve patient care.
**Methods:** All VW patients diagnosed with ulcerative colitis (UC) or Crohn's disease (CD) receiving biologics (infliximab, adalimumab, certolizumab, vedolizumab, ustekinumab, tofacitinib) from 2018 to 2021 were included. Demographic data (age, race, ethnicity), insurance type, biologic type, date of IBD diagnosis, and date of biologic initiation were collected.
**Results:** Of the 17 CD patients,14 were non-Hispanic and 12 identified as White. Median (mean, range) duration from diagnosis to prescription was 0 (3.67, 0-11) months for Hispanics compared to 28.5 (39.64, 1 – 122) months for Non-Hispanics (P=0.224) and 13 (29, 7-98) for non-Whites compared to 27.5 (35, 0-122) for Whites (P = 0.618).
Of the 31 UC patients, 15 were Hispanic and 28 identified as White. Median (mean, range) duration from diagnosis to prescription was 19 (39.87, 0-271) months for Hispanics compared to 62.5 (39.87, 6-254) months for Non-Hispanics (P=0.0156). Analogous comparison of median (mean, range) were 47 (40.67, 7 – 68) for Non-White and 34.5 (63.7, 0-271) for Whites (P = 0.930).
**Discussion:** No racial disparities were observed in biologics initiation timing in our practice. In fact, Hispanic patients diagnosed with UC were started on biologics significantly earlier than non-Hispanic patients. The result could be in part a reflection of the racial and ethnic diversity among our providers. This study also suggests that as long as patients are insured, the barrier to receiving biologics is no different regardless of racial or ethnic backgrounds.

## *Translating Research into Clinical Practice for Lung SBRT: Making sure the message is not lost in translation.*

N. Thawani[1], C. Kirsch[2], J. Lee[3], S. Patel[4], D. Pinnaduwage[5], S. P. Srivastava[6], S. P. Sorensen[4], S. Jani[4], S. Ellefson[7], V. Torri[7], A. Saeed[7], J. Huang[8], M. Smith[9], S. Vasireddy[10], J. Riley[11], M. Jennifer[7], D. Aidnag[12], R. Gagliano[13], and R. Bremner[8]; [1]Dignity Health Cancer Institute/ CUSOM/ UACC, Phoenix, AZ, [2]Creighton School of medicine- Phoenix, Phoenix, AZ, [3]Creighton School of Medicine-Phoenix, Phoenix, AZ, [4]University of Arizona Cancer Center / Dignity Health Saint Joseph Hospital, Phoenix, AZ, [5]St. Joseph's Hospital and Medical Center, Phoenix, AZ, [6]Dignity Health Cancer Ins, Phoenix, AZ, [7]Dignity Health cancer Institute, Phoenix, AZ, [8]Norton Thoracic Institute/ St Joseph's hospital and medical center, Phoenix, AZ, [9]Norton Thoracic Institute/ St Joseph's Hospital and Medical Center, Phoenix, AZ, [10]University of Arizona Cancer Center, Phoenix, AZ, United States, [11]St Joseph's Hospital and Medical center, Phoenix, AZ, [12]DHCI, Phoenix, AZ, [13]Dignity Health Cancer Institute, Phoenix, AZ

**Purpose/Objective(s):** Implementation science methodologies have been shown to reduce

research-to-practice gaps in many clinical settings. We present the results of a multicomponent implementation methodology implemented to our lung SBRT program as a model to safely translate Clinical trial guidelines into clinical practice to ensure comparable outcomes.
**Materials/Methods:** After literature review and market research a clinical workflow was created with focus on machine requirements, immobilization devices, motion management techniques and QA methods. Patients were treated on Truebeam® with Bodyfix® immobilization with abdominal compression or CyberKnife®. Clinical outcomes including clinical and imaging follow-up for tumor control and toxicity were recorded. For this report, all patients treated were reviewed and compared to published data to assess the success of the implementation methodology.
**Results:** 130 patients with primary lung malignancies were included in this analysis to assess outcomes including control of disease and toxicity to compare to the published literature. Median follow up for these patients was 13 months. Histology-50.8%-Adenocarcinoma, 27.7%-Squamous Cell Carcinoma, and 2 others. All peripheral lesions were treated with 54 Gy/3 fr, central/ ultracentral lesions received 50/55 Gy in 5 fr. Local control rate was 98% at one year and 96% at 3 years. 7% developed regional progression and 6% distant metastasis. Acute toxicity was not seen. Subacute Pneumonitis Grade 1-16.92% and Grade 2- 1%. 30.77% patients showed signs of chronic grade 1 fibrosis after treatment noted on CT scans only. There were no grade 3 or 4 toxicities. OS was 51.56% (1 yr), 38.24%(3yr). These results are comparable to RTOG 0618/0813.
**Conclusion:** Strong, well thought out Implementation methodologies are essential for translation of comparable results from clinical trials to routine practice. Regular assessment and tracking of clinical outcomes can be potentially used as quality markers for directing care and future reimbursements and useful tools in clinical practice integration.

## ***Benefits of 3D Printed Circle of Willis: Simulation and Cost Effectiveness***

Kirsch, Jack[1]; Patel, Shiv[1]; Moon, Eugene[1]; Chong, Hector[1]; Dunning, Elise[1]; Richardson; Randy[2]
[1]Creighton University School of Medicine, [2]Creighton University Department of Radiology

**Abstract:**
The purpose of this is to determine the cost-effectiveness of 3D printing vasculature models for procedure simulation and training. We aim to delineate the process of converting a head tomography angiogram (CTA) into a 3D printed model for simulations such as Circle of Willis navigation and large artery embolization.

The Circle of Willis and its neighboring branches were 3D printed using a CTA brain image. The model was hollow, elastic, and transparent with varying vessel sizes. We found that the diameter of the arteries varied from 0.7-3.6 mm throughout the entirety of the model with an average wall thickness of around 1 mm. The Form3 printer at the price of $3,499 printed our model at a resolution of 100 um layer thickness using a total resin volume of 52 mL. With the current price of resin at $0.15/mL, our single print costs about $7.80 of resin.

Our 3D-printed model of the Circle of Willis was produced at a significantly lower cost than many models currently sold for simulation training. Preservation of haptic feedback was maintained as our model is both hollowed and transparent allowing for direct visualization of catheter and wire advancement. We specifically aimed to 3D print this model as it not only demonstrates the ability to accurately create both large and small vessels but also acts as a tangible method of visualizing the anatomical complexity of a significant neurovascular structure.

Models like these can be used not only for simulation training purposes but also for medical student and patient education. Due to the complexity and variance of human vasculature and anatomy, tangible and high-fidelity models such as this one allows for more robust training and educational opportunities as compared to conventional methods.

***Thromboelastography Platelet Mapping Assay in Intracranial Hemorrhage Patients, Does Age Matter?***

Eric Lam, Emily Reeson, Clay Rahaman, Grace Tolan, Devin O'Toole, Oluwatosin Babarinde, Hahn Soe-Lin, Michael Jones, Jordan Weinberg, James Bogert

**Background:** Thromboelastography (TEG) is a whole blood measure of coagulation. Platelet mapping TEG detects derangements in platelet aggregation through the ADP pathway. Inhibition of this pathway has been associated with mortality traumatic intracranial hemorrhage (tICH). However, the level of inhibition that is important and its relationship with age are not well defined. The purpose of this study is to validate %ADP inhibition as a threshold for poor outcome in adult patients with tICH and by age.
**Methods:** TEG results for patients admitted to a Level 1 trauma center with tICH between Dec 2017 and Jun 2021 were reviewed. Receiver operating characteristic curves were used to test %ADP inhibition as a predictor of mortality. The area under the curve (AUC) is reported for the overall cohort and stratified by age using the threshold that maximizes the AUC in addition to the previously published threshold of 60% ADP inhibition.
**Results:** TEG results were reviewed on 169 patients with the following age distribution (15 – 39 years, 16.6%; 40 – 64 years, 29.7%; 65 – 74 years, 20.0%, 75+ years 33.8%) and head/neck injury severity 3.7±1.0. Mortality rate was 11.8% (n=20). The AUC was 0.65 for the overall sample with a threshold set to >44.2% and 0.64 for the sample with the threshold of 60% ADP inhibition. In both models AUC increased with age (Table 1). In both models, the AUC for mortality based on %ADP inhibition was < 0.56 in patients < 65 years old and >0.74 for patients > 65 years old.
**Conclusion:** In patients with intracranial hemorrhage, increased ADP inhibition discriminated mortality better if age was > 65. Caution should be used when applying ADP inhibition to tICH patients of all ages.

Table 1. AUC predicting mortality from ADP % Inhibition

| **Patient Age** | **Best fitting AUC** | **AUC if threshold set to 60%** |
|---|---|---|
| 15 – 39 years | 0.332 (0.09 – 0.57) | 0.437 (0.15 – 0.72) |
| 40-64 years | 0.554 (0.33 – 0.78) | 0.541 (0.29 – 0.79) |
| 65 – 74 years | 0.742 (0.37 – 1.00) | 0.769 (0.51 – 1.00) |
| 75+ years | 0.852 (0.71 – 1.00) | 0.770 (0.55 – 1.00) |

## *Comparing Interventional Radiology Local Tumor Destruction Techniques for Colon Cancer: A SEER Database Analysis*

Legenza, Ashton[1] Burdyny, Michael;[1] Silberstein, Peter;[2] Tupper, Connor;[1]
1 Creighton University School of Medicine, Omaha, NE, USA
2 Division of Hematology/Oncology, Creighton University Medical Center, Omaha, NE, USA

**Abstract:** Colon cancer is a prevalent malignancy with a significant number of patients presenting with locally advanced or metastatic disease, despite the availability of surgical and systemic therapies. Interventional radiology has emerged as a valuable tool in the management of colon cancer, offering a range of minimally invasive treatments aimed at locally destroying the tumor. This study aims to compare the effectiveness and prognostic impact of different interventional radiology procedures for colon cancer to determine the optimal treatment strategy.
**Methods:** We queried the Surveillance, Epidemiology, and End Results (SEER) database for patients diagnosed with primary colon cancer from the cecum to the sigmoid (primary site codes C180-189), including the appendix, diagnosed between 2000-2019. Patients were included if primary tumor management included local tumor destruction (LTD) via electrocautery, cryosurgery, or laser ablation, with or without excisional biopsy or polypectomy. Statistical analyses included Kaplan-Meier and Chi-square.
**Results:** A total of 830 patients were collected from this search, of which 731 had electrocautery with excision, 32 had an LTD, 26 had electrocautery only, 13 had cryosurgery with excision, and 28 had laser ablation with excision. On Kaplan-Meier, electrocautery with excision showed better survival than LTD alone, electrocautery alone, and laser ablation with excision (p's<0.001). There were no other statistically significant differences between the studied treatments. The one-, three-, and five-year survival rates of electrocautery and excision treatment were 97.3%, 95.1% and 94.0% respectively, which is significantly different at the three- and five-year marks, likely driven by improved survival in the electrocautery with excision group (p's<0.001). **Conclusion:** Electrocautery with excision is associated with improved survival compared to local tumor destruction alone, electrocautery alone, and laser ablation with excision. Based on our findings, electrocautery with excision is a potentially superior interventional radiology procedure that warrants consideration in the management of primary colon tumors.

## *Social Media Health Information for Pediatric Musculoskeletal Infections*

Varun Mahadevan (1), Kajol Majhail (2), Mohan Belthur (2)
(1): Creighton University School of Medicine, Phoenix AZ
(2): Phoenix Children's Hospital, Phoenix AZ

**Background:** Existing data on the information available on social media about pediatric musculoskeletal infections is limited. Our study explored the availability and quality of information on four of the most popular social media platforms (Facebook, Instagram, Twitter, and YouTube) about two of the of the most prevalent pediatric musculoskeletal infections: osteomyelitis and septic arthritis.
**Significance of Problem:** Pediatric musculoskeletal infections are common, occurring in up to 80 per 100,000 children as of 2015. These infections can all initially present with minor, vague symptoms such as joint pain, limp, and fever, complicating early diagnosis. Social media may provide a platform for patients to learn more about their musculoskeletal infection and find support through their experience.
**Hypothesis:** Social media websites provide valuable information about pediatric musculoskeletal infections.
**Experimental Design:** A cross-sectional study design was applied to analyze information

on osteomyelitis and septic arthritis on YouTube, Facebook, Instagram, and Twitter. Group differences were tested via Kruskal–Walli's test and Fisher's exact tests for continuous and categorical variables, respectively.
**Results:** A total of 200 Instagram posts, 100 Twitter posts, 100 YouTube videos, 52 Facebook videos, 22 Facebook groups, and 10 Facebook pages were identified. The most common country that posts originated from was the United States. The most common source of information on Instagram was from personal accounts (56%), on Facebook was from support groups (68%), and on Twitter was from personal accounts (46%).
**Conclusions:** Social media can serve as a source for medical information about pediatric musculoskeletal infections. Hence, further investigation should explore how medical institutions can better disseminate medical information through their social media platforms.

***Socioeconomic Factors and Malignant Rhabdoid Tumors of the Head and Neck: An Analysis of the National Cancer Database***

Malan, Augustus; Luker, Andrew; Stewart, Laura; Hsia, Beau; Wu, Xinxin; Keirns, Darby; Silberstein, Peter MD

**Background:** Malignant rhabdoid tumors (MRT) of the head and neck are rare malignancies that contribute to 15% of extracranial tumors. MRTs have a one-year survival rate of 31% and overall survival rate of 23.2%. These tumors are often found in pediatric patients who have a greater chance of adverse outcomes. Treatment protocols for MRTs are not well established making them difficult to manage.
**Methods:** A total of 45 patients who were diagnosed histologically were involved in this retrospective cohort study utilizing 2004 – 2020 NCDB data from facilities accredited to the Commission on Cancer in the U.S. and Puerto Rico. The following demographic variables were evaluated with descriptive statistics: age, sex, race, Hispanic status, income, and insurance status. Regression analysis was used to examine the trend in incidence.
**Results:** Between 2004 and 2020, an average of 2.65 patients per year were diagnosed with MRTs ($R^2 = 0.11$). The average age of patients was 68 years (SD = 17.2, Range = 0 – >90 years). Males were more likely to be diagnosed (55.6%) than females (44.4%). The largest group of patients consisted of individuals who identified as non-Hispanic White (75.6%). In comparison to the other quartiles, the highest income bracket had more patients (52.5%). Private insurance was the most common among patients (44.4%), followed by Medicaid (28.9%) and Medicare (22.2%).
**Conclusions:** This study is the first to analyze the socio-demographic data of individuals with MRTs and reveals that the majority of patients have higher incomes, are insured by private insurance, and are non-Hispanic White. Additional research is necessary to explore the connection between race, income, and diagnosis. Given the poor prognosis associated with these tumors, studying the relationship between age of diagnosis and socioeconomic factors could illuminate important information regarding differences in risk factors or biases in diagnosis.

***Threshold Analysis of Predictive Pressure Markers for Outcomes in Traumatic Brain***

Stefan W. Koester, MSc; Ali Memon, BS; Brandon Hoglund, MS; Joelle N. Hartke, MD; Ethan Winkler, MD; James Bogart, MD; Dih Huang, MD; Jordan Jacobs, MD; Hahn Soe Lin, MD. Jordan Weinberg, MD; Michael T. Lawton, MD; Ruchira Jha, MD, MSc; Joshua S. Catapano, MD; Laura Snyder, MD
Barrow Neurological Institute Department of Neurosurgery

**Abbreviations:** Systolic Blood Pressure (SBP), Intracranial Pressure (ICP), Cerebral Perfusion Pressure (CPP), Mean Arterial Pressure (MAP), Heart Rate (HR), Serum Sodium

(SS), Traumatic Brain Injury (TBI), Injury Severity Score (ISS), Intraparenchymal Hemorrhage (IPH), Subdural Hemorrhage (SDH), Subarachnoid Hemorrhage (SAH)

**Abstract:**
The purpose of this study is to understand the role of SBP, ICP, CPP, MAP, HR, and serum sodium at predicting clinical outcomes for TBI. 131 TBI patients from January 1st-December 31st, 2017, were retrospectively reviewed at a Level 1 trauma center. The primary outcome measure was favorable discharge GCS (>13). Optimal cutoff points were determined using Euclidean distance analysis. General linear multivariable models adjusted for confounders, including age, gender, ISS, neurosurgical intervention, and admission GCS. Sub-analysis was conducted for IPH, SDH, and SAH. After multivariate adjustment independently for each cutoff, admission HR ≥ 97 (OR = 0.32, 95% CI [0.10, 0.95], p = 0.039), maximum MAP ≥ 134 (OR = 0.26, 95% CI [0.08, 0.76], p = 0.018), and maximum sodium ≥ 142 (OR = 0.21, 95% CI [0.06, 0.68], p = 0.012) remained significant predictors of poor neurological outcome. Additional adjustment was made for administration of hyperosmolar therapy for patients with maximum sodium ≥ 142, which remained significant (OR = 0.22, 95% CI [0.06, 0.74], p = 0.017). In the sub-analysis with thresholds optimized for discharge GCS, minimum MAP ≥ 57 (OR = 0.39, 95% CI [0.15, 1.00], p = 0.049) was associated with lower odds of IPH/SDH/SAH expansion while maximum MAP ≥ 134 (OR = 3.09, 95% CI [1.07, 8.59], p = 0.032) was associated with higher odds of IPH/SDH/SAH expansion. When thresholds were optimized for IPH/SDH/SAH expansion, minimum sodium ≥ 139 (OR = 3.88, 95% CI [1.39, 10.7], p = 0.009) was associated with higher odds of IPH/SDH/SAH expansion. Altogether, the results suggest that a narrower range of MAP value maintenance and a ceiling for sodium levels could promote more favorable functional outcomes in TBI, and that admission HR could be a predictive parameter for risk stratification for at the point of triage.

## ***Caring for a Rural Population: Extending the Reach of Level One Trauma with Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA)***

Nguyen, Daniel; Chapple, Kristina M.; Huang, Dih-Dih; Soe-Lin, Hahn; Weinberg, Jordan A.; Bogert, James N.

**Abstract:** Hemorrhage is the most common cause of preventable trauma mortality. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has gained traction as a method of temporary hemorrhage control in many trauma centers; however, implementation has been limited. A significant proportion of patients live greater than one hour from a level 1 trauma center and often are transported to lower-level centers first, making REBOA a potential bridge to definitive care. This study describes the incidence and injury burden of patients requiring interfacility transfer whose outcomes may have been improved by REBOA.

We queried the Arizona Trauma Registry between 2014 and 2017 for hypotensive patients seen at non-level 1 trauma centers who were transported to a level 1 center or who died in the ED of the referring facility. Data included age, vital signs, ICD-9, and ICD-10 diagnoses, and injury severity score (ISS). REBOA candidates were identified as those who had injuries consistent with major infra-diaphragmatic torso hemorrhage as the likely cause of death.

Of 17,868 interfacility transfers during the study period, 347 patients met inclusion criteria; 333 had sufficient data for evaluation. 26 of the 333 patients were identified as REBOA candidates. Median ISS of the REBOA candidates was 19. Only 3 REBOA candidates had comorbid traumatic brain injuries. All but one REBOA candidate died at the referring facility

prior to transport.

A small but significant number of patients die after arrival at their nearest hospital but before transportation to a level 1 trauma center. Our study suggests that REBOA may be an effective means to extend survivability to those severely injured trauma patients needing interfacility transfer. In the resource constrained environment of healthcare, equipping lower-level trauma centers with REBOA capability may provide expanded geographic capacity for effective population-based trauma care without the costly expansion of level 1 trauma centers.

### *Clinical Validation of a Novel Smartphone Application for Measuring Best Corrected Visual Acuity in Adults*

Ogino, Mari; Hunter, Stephen; Hussey, Vincent; Suh, Donny; Gore, Rujuta; Salmeron-Campillo, Rosa; Lopez-Gil, Norberto; Jaskulski, Matt

**Purpose:** To clinically validate the accuracy of the novel smartphone application, vision.app, in the measurement of best corrected visual acuity (BCVA) using comparative statistics against traditionally obtained measurements during a comprehensive eye exam.
**Background:** While telemedicine has always been an attractive means of providing care to patients remotely, the COVID-19 pandemic highlighted the critical need for an accurate and accessible teleophthalmology platform. Personal mobile devices have proven their utility in telemedicine, but the accuracy of current applications that assess changes in visual acuity (VA) are limited by a lack of external validation and user error. Through facial recognition technology, the present application aims to target the limitations of its predecessors.
**Methods:** BCVA was measured in n=48 eyes using vision.app installed on four smartphones. The app displayed a Landolt C optotype and utilized a 4-force choice procedure loosely based on the Freiburg Visual Acuity & Contrast Test. The angular size of the optotype was automatically scaled as a function of the face-to-screen distance, which was continuously measured via the face camera. Results were compared to clinical BCVA measurements taken with a standard Snellen chart placed at 3m. To assess the similarity of measurement methods, a statistical analysis was performed based on a two-tailed, paired t-test.
**Results:** The t-test revealed no significant difference in measured VA ($p = 0.415$), with a mean difference between measurement methods of less than one letter (0.005 logMAR). Bland-Altman analysis showed a mean difference between measurement methods was 0.05 LogMAR (95% CI), with a standard deviation of 0.153.
**Conclusion:** The results suggest that BCVA can be reliably measured through the novel dynamic optotype scaling by vision.app in adults. The results have major implications in advancing telemedicine and providing ophthalmologists with a reliable and accessible method to measure VA and communicate results to patients.

### *Case Study: Horsetail Dandelion Tea Drug-induced Acute Pancreatitis*

Pacheco, Crestina; James, Clayton MD
Creighton University School of Medicine, Department of Internal Medicine

**Abstract:** Patients often present with acute pancreatitis due to biliary or alcohol etiologies. We report the case of a 48-year-old male with history of type 2 diabetes, hypertension, and prior MVA resulting in spleen removal who presented with severe epigastric abdominal pain radiating to the back without recent alcohol use. He was subsequently diagnosed with acute necrotizing pancreatitis via elevated lipase combined with CT and ultrasound studies. Upon further history it was discovered that he had been ingesting 32 oz. of horsetail

dandelion tea. There has been one other documented case report of acute pancreatitis caused by horsetail tea. Dandelion tea is not known to cause acute pancreatitis. However, dandelion root extract has been studied as a possible treatment for pancreatic cancer. Drug-induced acute pancreatitis due to naturopathic teas and tinctures is not something providers often think to include on their differential. Inclusion of other possible acute pancreatitis etiologies is important to prevent their recurrence and prevent further sequalae.

### ***Demographic and Socioeconomic Factors in Pleomorphic Liposarcoma: A National Cancer Database Analysis***

Paul, Ben; Stewart, Laura; Hsia, Beau; Wu, Xinxin; Keirns, Darby; Silberstein, Peter, MD
Creighton University, Department of Hematology and Oncology

**Background:** Pleomorphic liposarcoma (PL) is an uncommon cancer that affects lipoblasts, the immature form of adipocytes and can affect the head and neck. Despite its rare incidence, PL has a five-year survival rate of just 39%. In order to explore the demographic factors of patients who have been diagnosed with PL, the National Cancer Database (NCDB) was analyzed.
**Methods:** A retrospective cohort analysis utilizing the 2004 – 2020 NCDB identified patients with a histologically-confirmed diagnosis of PL (N = 40). Regression analysis was used to evaluate incidence trends, and descriptive statistics were used to analyze select demographic factors including age, race, Hispanic status, primary site, urban status, facility type, and Charlson-Deyo score.
**Results:** A total of 40 patients were identified in the database with a confirmed diagnosis of PL between 2004 and 2020 with a steady incidence of patients diagnosed per year ($R^2$ = 0.053). The average age of diagnosis was 46.3 years (SD = 19.3, range = 11 – 84 years). Most individuals diagnosed with PL identified as White (70.0%) and 80% were non-Spanish (non-Hispanic). The most common primary site of PL was the anterior mediastinum (52.5%, n = 21), followed by mediastinum, NOS (25.0%, n = 10). Most patients (80.0%) are from metropolitan areas with a population greater than 250,000 people. Most patients (80.0%) had a Charlson-Deyo Score of 0.
**Conclusions:** This NCDB analysis on otolaryngological PL addresses a gap in the literature, as there has not been any previous demographic or socioeconomic studies done to our knowledge. This study found PL patients to be more likely to be White, live in urban areas, and be treated at non-academic institutions. Considering its aggressive nature, further research should aim to better understand how demographic and socioeconomic factors influence the diagnosis of PL, how it is treated, and its survivability.

### ***Demographic Profile of Peripheral Neuroectodermal Tumors***

Pidathala, Sai; Hsia, Beau; Wu, Xinxin; Keirns, Darby; Silberstein, Peter, MD
Creighton University, Department of Hematology and Oncology

**Background:** Peripheral neuroectodermal tumors (pNET) are tumors of primitive embryonic nerve cells. These tumors are very aggressive and rare. They are more common in young people and children. They usually present as small cell round tumors in the chest wall but can arise anywhere. This cancer has very low incidence rates. Data from the National Cancer Database (NCDB) was used to analyze socio-economic and demographic correlations to get a better profile of this disease.
**Methods:** A retrospective study was conducted to analyze the demographic parameters of peripheral neuroectodermal tumors of the head and neck. The sample size for the analysis was 43 patients who were diagnosed with peripheral neuroectodermal tumors between 2004 and 2020. The demographic factors included were sex, race, facility type and location,

education level, insurance status, and Charles-Deyo score. Regression analysis was conducted to determine incidence rates, and descriptive statistics were used to interpret the relationship between demographics and cancer occurrence.
**Results:** The cancer was more commonly found in males than in females (55.8% vs. 44.2%). Most of these patients went to Academic Medical Centers for treatment in comparison to community or integrated network programs (27.9% vs. 21%). Most of the patients were on privatized insurance compared to government programs (62.8% vs. 27.9%). A majority of the patients were from larger metro areas with populations exceeding one million (44.2%).
**Conclusions:** This study will contribute to the limited literature about this class of tumors by exploring the relationships between different demographic factors and the incidence of pNETs. Patients with pNET were more likely to be from highly populated metropolitan areas, receive care in an academic medical center, and be on privatized medical insurance. Further research with more robust datasets is essential to understand the role of different demographic and socioeconomic parameters on incidence, survival, and treatment.

### ***Recurrent Psoas Abscess in an HIV Patient: A Case Report on a Unique Presentation and Management of Disseminated TB***

Pon, Matthew, Macelwee, Mark, Bowman, Nick, Yusuf, Aisha
Creighton University Department of Medicine

**Abstract:** In 2021, 1.6 million people died from TB worldwide, including 187,000 HIV patients, making TB the 13th leading cause of death and second leading infectious cause of death after COVID-19. Immunocompetent patients frequently clear the primary TB infection, but in those with HIV or any immunocompromised state, reactivation or spread poses a real danger to their health. Disseminated TB can spread to almost any organ, with the more common presentations of liver abscesses, lymphadenitis, or skeletal or joint infections being more commonly studied in scientific literature. The HIV population experience more rapid progressions and visceral lymphadenopathy, all possibly with a negative TB test, warranting vigilance and awareness for the complications that can ensue.
Our patient was a 32-year-old male with a history of HIV treated with biktarvy, G6PD deficiency, recurrent abscesses, who presented with right sided back pain, abdominal fullness, and worsening pain that radiated down the right leg for several weeks. He was intermittently febrile and tachycardic, and all cultures were negative throughout his course. After consulting IR, Neurosurgery, and ID, PCR analysis of his psoas abscess drain revealed TB as the cause of his infection. The patient was started on RIPE therapy, which caused adverse drug interactions with his HIV CART and his drug regimen to be changed. The patient was discharged in stable condition and followed close follow up with a multi-disciplinary team.
Overall, our patient's muscular abscess is a unique presentation of disseminated TB in the HIV population, requiring an unconventional use of PCR to diagnose the underlying etiology, and an instance where RIPE and CART treatments had to be tailored to avoid adverse drug interactions. This case provides insight regarding diagnoses of disseminated TB in HIV patients and what drug regimens must be considered to avoid adverse interactions.

### ***Presentation of Erythema Nodosum in a patient with Coccidioidomycosis Infection***

Noory, Eliace; Noory, Mukhtar; Ponce, Esai; Hazin, Moustafa
Creighton University, Department of Medicine

**Abstract:** Erythema Nodosum, a type of panniculitis, is an inflammatory disorder with a

delayed-type hypersensitivity reaction occurring more commonly in women. This condition, although not life threatening, can present with bilateral painful erythematous subcutaneous nodules on the anterior shins erupting over one to several weeks accompanied by fever and joint pain. The causes of erythema nodosum can range from idiopathic etiology, infectious agents (Streptococcal Infections, TB, Yersinia, Coccidioidomycosis, and Histoplasma), drug induced (Sulfonamides, Oral Contraceptives), malignancies (Leukemia, Lymphoma) and inflammatory bowel disease (Crohn's Disease and Ulcerative Colitis). Within the medical environment, distinguishing erythema nodosum from other rashes and skin pathologies can be difficult due to their similar manifestations of tenderness and erythematous. In this case, the patient presented with erythematous exanthem on both lower extremities and posterior triceps, which was associated with worsening pain, pins and needles sensation, fever, and tachycardia. Her recent exposure to bed bugs, location of occupation, use of marijuana, and family history of hepatitis B could all play a role in her presenting skin rash. To ensure a correct diagnosis, laboratory testing is used to narrow down the causative etiology of the rash. In regard to this patient, her positive Coccidioides IgM and IgG, elevated inflammatory marker CRP and being an Arizona local, lead to the conclusion of an infectious prodrome from Cocci infection (Valley Fever), leading to the immunological response. As coccidioidomycosis is an infection with a dimorphic fungus (coccidioides), patients with primary pulmonary infection should be treated with fluconazole for 3-6 months. Disseminated infections on the other hand can be treated with amphotericin B or itraconazole for at least one year. In conclusion, Coccidioidomycosis should be suspected in the presence of any alarm findings and erythema nodosum especially with Valley Fever being Endemic in Arizona.

***Does Methadone Increase Constipation and Post- Operative Ileus Risk in Major Spine Surgery: A Retrospective Case-Control Study***

Romain Rabany, Colin Kirsch, Emma Parenteau, Areen Badwal, Zohal Sarwary, Brian Wilhelmi M.D. J.D. Creighton University School of Medicine

**Introduction:** Postoperative ileus (POI) and severe constipation (SC) are common complications, with an incidence rate of 10-30% for all surgeries. They have the possibility of delaying progression of care, increasing morbidity and mortality, and requiring additional surgeries to fix the iatrogenic disease.
POI and SC have been linked to the mu opioid receptor, as such, Methadone is gaining traction as a pain analgesic. A better understanding of methadone and its effects perioperatively relating to POI and SC can help reduce morbidity and mortality related to surgery as well as hospital efficiency.
**Methods:** This retrospective case-control study of patient charts included 286 adult patients who underwent a multilevel spinal surgery (MSS) from May 2013- March 2019 at the Barrow Neurological Institute at St. Joseph's Hospital and Medical Center. Cerner was used for chart reivew. Exclusion criteria included: preoperative history of severe constipation prior to surgery, prior colon surgery resulting in colostomy, and preoperative regular daily use of methadone. The remaining patient records were divided into: MSS patients without SC or POI, MSS patients with SC or POI. Statistical analysis was done using Microsoft Excel.
**Results:** 282 patients (118 males, 164 females) were included in this chart-review study. Of these patients, 173 had no methadone administered, while 110 had methadone. Patients with a higher ASA physical status was less likely to get methadone during surgery ($P<0.01$). First 24hr total morphine after surgery was reduced in the non-methadone group compared to the methadone group (113.3mg vs 158.9mg; $P<0.047$).
**Conclusion:** This study found that intraoperative Methadone administration in MSS is not

correlated to POI and SC in MSS. Further trials are needed to investigate the effects of Methadone on ICU length of stay as this trending statistic could give reason for the cessation of methadone in MSS.

### *Newer Isn't Always Better: TEG 5000 vs TEG 6S in the Setting of Traumatic Intracranial Hemorrhage*

Clay Rahaman, Emily Reeson, Eric Lam, Devin O'Toole, Grace Tolan, Oluwatosin Babarinde, Dih-Dih Huang, Hahn Soe-Lin, Jordan Weinberg, James Bogert

**Background:** Platelet mapping thromboelastography (PM-TEG) detects derangements in platelet aggregation through the ADP pathway. Inhibition of this pathway has been associated with mortality in traumatic intracranial hemorrhage (tICH). This association was previously observed using TEG 5000; however, many hospitals have since adopted the newer TEG 6S for viscoelastic testing. We sought to evaluate if this association remains valid with the TEG 6S platform.
**Methods:** PM-TEG results for patients admitted to a Level 1 trauma center with tICH between Dec 2017 and June 2021 were matched on patient age, injury severity score (ISS), and head/neck injury severity (H-AIS). Receiver operating characteristic curves were used to compare the Area Under the Curve (AUC) for %ADP inhibition as a predictor of mortality for TEG 5000 vs. TEG 6S. This AUC is reported for the overall cohort and stratified by age at 65 years.
**Results:** PM-TEG results were reviewed on 302 matched patients (151 TEG 5000 and 151 TEG 6S) with an average age of 66.1±17.7 years, mean ISS and H-AIS of 17.6±8.6 and 3.6±1.0. Mortality rate was 11.9% (n=36). There was no difference in AUC between groups (P=.524) or subgroups age <65 (P = 0.245, Table). However, TEG 5000 was a superior discriminator of mortality compared to TEG 6S for patients ages ≥ 65 (AUC 0.76 vs 0.47, P = 0.026).
**Conclusion:** Among older patients with tICH, TEG 5000 appears to be superior to TEG 6S with respect to the association between ADP inhibition and mortality. This observation calls into question the utility of TEG 6S for older patients. Caution is warranted when using TEG 6S in this setting.

### *Perspectives of orthopaedic surgeons on body mass index thresholds for total joint arthroplasty: A qualitative study*

Kristine Godziuk[2], Emily A. Reeson[1], Alex S. Harris[3], Nicholas J. Giori[3]
[1] Medical Student, School of Medicine, Creighton University (Presenting Author)
[2] Faculty of Agriculture, Life and Environmental Sciences, University of Alberta; Visiting Postdoctoral Scholar, Stanford University
[3] Department of Orthopaedic Surgery, School of Medicine, Stanford University

**Introduction:** Use of patient body mass index (BMI) thresholds as eligibility criterion for total joint arthroplasty (TJA) is a debated topic in orthopaedics. While strict BMI cut-offs can reduce surgical infection rates, they also create disparities in accessing osteoarthritis treatment. There is a gap in understanding complex influences on surgeon decision-making for TJA eligibility. Better understanding of factors supporting use of BMI in risk assessment will inform new strategies for surgical risk stratification and access inequities reduction. This research aimed to identify orthopaedic surgeons' practice, rationale, and perspectives regarding BMI thresholds for arthroplasty eligibility.
**Methods:** United States surgeons who conduct hip and knee TJA completed an online cross-sectional qualitative survey distributed through national and regional orthopaedic surgeon groups. Open-ended questions were designed using the Consolidated Framework for Implementation Research constructs to identify relevant factors. Responses were

collected anonymously to capture nuanced and candid answers. Survey data was coded and analysed in a recursive and systematic process to identify predominant themes.
**Results:** N=45 surveys were completed. Respondents were age 54.3±12.4 years, practicing in 25 states, with surgical experience of 21.2±13.3 years. Twelve key factors influencing use of BMI thresholds were identified: 1) practice variation, 2) evidence versus experience, 3) surgical difficulty, 4) ethics and biases, 5) policies and performance metrics, 6) surgical resources, 7) professional ramifications, 8) patient body weight distribution, 9) patient advocacy, 10) decisional influence in the clinical encounter, 11) pre-surgical weight loss expectations, and 12) research and innovation gaps. These factors had foundational origins across the healthcare organizational structure (Figure 1), including surgeon, patient, clinical encounter, and healthcare system.
**Conclusion:** Multilevel and complex factors underlie use of BMI thresholds for TJA eligibility. Identified factors at the patient, surgeon, and health system levels should be considered to optimally balance complication avoidance with improving access to life enhancing surgery.

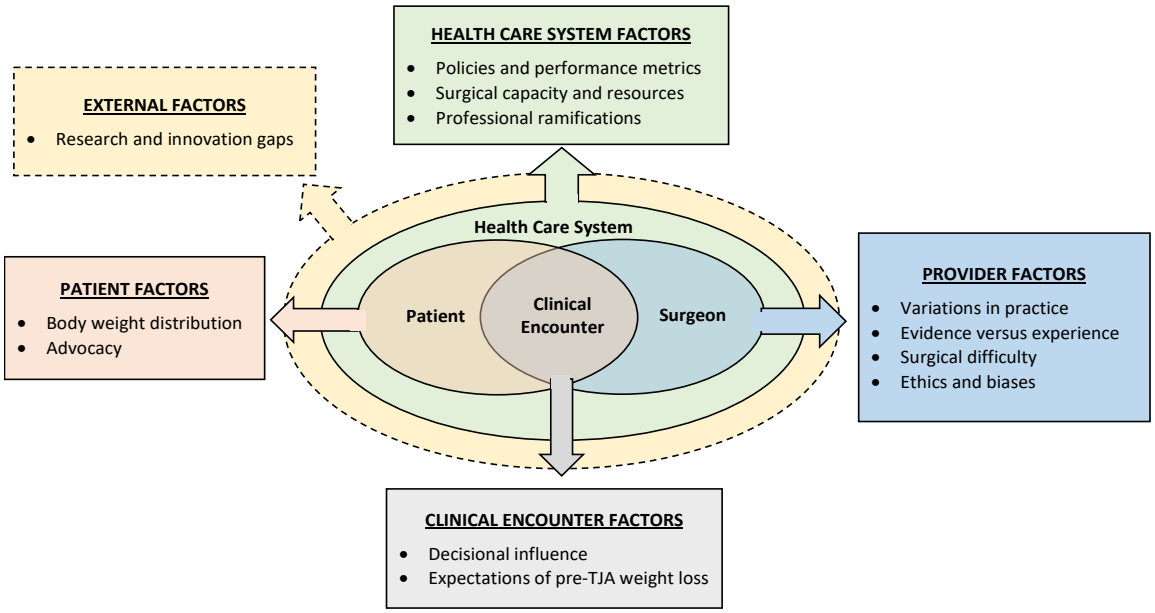


**Figure 1.** Factors influencing BMI threshold use for TJA access under their origin areas in the Health System Disparities Model, identified by thematic analysis of n=45 orthopedic surgeon surveys

## ***Otolaryngological Infiltrative Basal Cell Carcinoma NCDB Demographic Analysis***

Riley, Dylan; Stewart, Laura; Hsia, Beau; Wu, Xinxin; Keirns, Darby; Silberstein, Peter, MD
Creighton University, Department of Hematology and Oncology

**Background:** Otolaryngological infiltrative basal cell carcinoma (OIBCC) is a rare subtype of basal cell carcinoma that extends into the surrounding dermis and subcutaneous tissue of the head and neck. The demographics of OIBCC patients in the US have not been studied. Therefore, these factors were analyzed using the National Cancer Database (NCDB).
**Methods:** A retrospective cohort analysis utilizing the 2004 – 2020 National Cancer Database (NCDB) included patients with a histologically-confirmed diagnosis of OIBCC (N = 37). Descriptive statistics were used to analyze demographic factors such as age, race, Hispanic status, household income, insurance status, facility type, and Charlson-Deyo

score, while incidence trends were interpreted through regression analysis.
**Results:** The NCBD database revealed 37 patients diagnosed with OIBCC from 2004 to 2020, with a consistent annual incidence ($R^2$ = 0.012). The primary site of OIBCC was the lips (45.9%), followed by the nose (18.9%). Non-Hispanic (89.2%), White (97.3%) patients comprised the majority, with 86.7% reporting a yearly income under $74,063. At diagnosis, the most frequent primary payor was Medicare (59.5%). The average age was 72 years (SD = 13.08; range = 44 -90). More patients sought care at comprehensive community cancer programs (45.9%) than academic/research programs (21.6%). The majority were assigned a Charlson-Deyo score of ≤ 1 (94.6%), and none received palliative care.
**Conclusions:** To our best knowledge, this is the first NCDB analysis conducted on OIBCC. The socioeconomic factors associated with OIBCC suggest that patients are more likely to receive treatment at non-academic programs and be insured by Medicare but are less likely to belong to the top income quartile. These socioeconomic factors may suggest barriers to preventative and diagnostic care for OIBCC patients. However, further research is necessary to comprehensively understand the effects of demographic and socioeconomic factors on OIBCC diagnosis, treatment, and overall survival.

### ***Prenatal diagnosis of retinoblastomas: a scoping review***

Aurora Rodriguez, Caitlin Kelley, Anjali Patel, Aparna Ramasubramanian MD

Retinoblastoma is the most common, pediatric primary intraocular malignancy. It arises from two mutated copies of the Retinoblastoma (Rb) allele that render the gene dysfunctional. In heritable or familial retinoblastoma, a dysfunctional RB allele is directly passed down from the biological mother or father to the embryo. Therefore, future parents with a family history of retinoblastoma are strongly advised to get genetic testing because if one of the parents is positive for a mutated RB gene, there is a 45% chance that their child will inherit it. An electronic literature search on PubMed was done exploring the prenatal diagnosis of retinoblastoma and the screening practices associated with it. Nine studies were included for investigation, and they indicated that prenatal testing for retinoblastoma in high-risk families is important for making informed family planning decisions, improving psychological well-being of the family, and providing an early diagnosis for the child. Furthermore, these practices have shown to yield better treatment and vision outcomes in the newborn.

### ***Association between primary language of patients and diabetes management through analysis of HbA1c levels***

Rusanowski, Sarah; Jones, Douglas, MD; Curtis, Jeffrey, MD, MPH
Creighton University School of Medicine, Department of Family and Community Medicine

**Introduction:** Primary spoken language may be an important health determinant. We tested the hypothesis that English-speaking patients with type 2 diabetes have better glycemic control than non-English-speaking patients.
**Methods:** Primary care encounters (non-obstetric, non-procedure) involving patients at least 18 years old with type 2 diabetes seen in the Valleywise Health primary care clinics at least once between January 1, 2018, and December 31, 2021, were analyzed. The primary independent variable was patient language, which was divided into English, Spanish, Mandarin, and Other. Age, sex, primary care provider, and encounter provider were also included in the analysis. Comparisons were analyzed with T-tests or chi-squared tests, and with the Kruskal-Wallis ANOVA for bivariate differences between means of HbA1c by language.
**Results:** In total 47,722 patient encounters involving 10,113 individual patients provided

sufficient data and are included in the analysis. English was spoken by 55.5% of the population, Spanish by 41.1%, Mandarin by 0.6%, and other languages (49 in total) by fewer than 0.4% each. The mean HbA1c was not significantly different between English- and Spanish-speaking patients (7.92% vs 7.97%, p=0.20), but the pairwise differences in HbA1c between English and the other two language groups were significantly different (Mandarin 6.85%, Other 7.60%, each pairwise p<0.001), where the HbA1c of non-English speaking patients was lower than for English speakers. After adjusting for age, sex, and continuity, HbA1c differences remained significant, suggesting that these variables do not explain the variability between groups.
**Conclusions:** Contrary to our hypothesis, we found that primary patient language other than English was associated with better glycemic control and non-English, non-Spanish speaking patients overall had lower HbA1c levels. Future studies should be done to determine why those speaking languages other than English or Spanish had better HbA1c levels in this population.

***The effects of transfusing cell saver blood on postoperative outcomes following multilevel spinal fusion surgery***

Zohal Sarwary, Areen Badwal, Jacquelyn Ho, Suhail Zeineddin MD, Brian Wilhelmi MD JD
Barrow Neurological Institute, Department of Anesthesiology

**Background:** Multi-level spinal fusion surgeries often lead to significant intraoperative blood loss and cell salvage is a common method for blood transfusion. Some studies show that its use may result in complications such as electrolyte imbalance or salvaged blood syndrome leading to acute lung and renal injury.
**Methods:** We collected data on individuals who underwent spinal fusion of ≥3 levels from January 2013-May 2018 and received cell saver blood and/or packed red blood cells intra-operatively.
**Results:** 268 patients were included in our study. Multivariable regression analysis showed that a history of coronary artery disease was associated with a higher probability of receiving any amount of cell saver blood intraoperatively (IRR 1.65, 95%CI 1.13-2.42). For every 1 kg/m^2 increase in BMI or additional spinal level fused, patients were 3% more likely to receive cell saver blood (IRR 1.03 95%CI 1.0-1.04 and IRR 1.03 95%CI 1.0-1.04, respectively). Conversely, a history of renal insufficiency (IRR 0.43 95%CI 0.19-1.0) and each level increase in ASA status (IRR 0.74 95%CI 0.56-0.97) were associated with decreased probability of receiving cell saver blood. Transfusion of cell saver blood intraoperatively was not significantly associated with any of our postoperative outcomes.
**Conclusions:** Our study shows that the autotransfusion of salvaged blood was not associated with detrimental postoperative effects compared to the exclusive use of donor blood. Our findings suggest that the addition of salvaged blood to a standard transfusion protocol does not have an appreciable effect on patient outcomes.

***Localized conditional induction of brain arteriovenous malformations in a mouse model of hereditary hemorrhagic telangiectasia.***

Scherschinski L, Han C, Kim Y, Winkler EA, Catapano J, Schriber TD, Vajkoczy P, Lawton MT, Oh SP.

**Background:** Brain arteriovenous malformations (AVMs), high-pressure connections between arteries and veins, are a primary cause of hemorrhagic stroke in adolescence. Hereditary hemorrhagic telangiectasia (HHT) is a genetic vascular disorder caused by mutations in activin receptor-like kinase 1 (*Alk1*), endoglin, or SMAD4, including AVMs throughout the brain and body. Longitudinal mouse models have historically been essential

for study of this disease type, most commonly using systemic Cre activation models. These models are limited for brain AVM studies, though, due to fatal visceral organ AVM formation. Our novel model instead uses CreER-mediated localized induction to model HHT brain AVM formation.
**Methods:** $R26^{CreER}$;$Alk1^{2f/2f}$ (Alk1-iKO) newborn mice received hydroxytamoxifen stereotactic injections directly to the striatum, parietal cortex, or cerebellum. Latex dye perfusion and 3D time-of-flight MRA were used to evaluate vascular malformation formation. Staining with immunofluorescent markers and Prussian Blue allowed for further definition of lesions.
**Results:** This model produced brain vascular malformations at a frequency of 73% (43/59), developing both nidal AVMs (38/43) and arteriovenous fistulas (5/43), with 4-week mortality of 3% (2/61). Stereotaxic injection in the striatum, parietal cortex, and cerebellum, of the *Alk1*-iKO mice generated vascular malformations in 73% (22/30), 76% (13/17), and 67% (8/12) respectively. Identical application in $R26^{CreER}$;$Alk1^{2f/2f}$; mT/mG reporter mice validated injection site localized Cre activity. AVM nidal stability was shown through repeat MRA of seven mice with mean duration of 7.2 months (SD: Range; 3:2.3-9.53). Sample analysis revealed microhemorrhaging and diffuse immune infiltration around AVMs.
**Conclusion:** This HHT mouse model for AVMs is novel in its ability to efficiently develop AVMS localized to stereotaxic injection specific regions. The vascular malformations produced similarly replicate human pathologic vasculature. This includes reproduction of intricate nidal architecture, arteriovenous shunting, microhemorrhaging, and inflammatory response. This model can be fundamental as a longitudinal method for advancement in understanding and treatment of brain AVM related disorders.

## ***Combination Antibiotic Elution in a Collagen-Rich Hydrogel Successfully Inhibits Polymicrobial Growth and Biofilm Formation in Human ex vivo Wound***

Ayushi Sharma BS[1,2,3], Evan Harris Jarman BS[1,2], Paige Fox MD PhD[1,2]
[1] Division of Plastic & Reconstructive Surgery, Department of Surgery, Stanford University School of Medicine, Stanford, California, USA
[2] Division of Plastic & Reconstructive Surgery, Veterans Affairs Palo Alto Health Care System, Palo Alto, California, USA
[3] Creighton University School of Medicine, Phoenix, Arizona, USA

Chronic non-healing wounds significantly strain modern healthcare systems, affecting 1-2% of the population in developed countries with costs ranging between $28.1 and $96.8 billion annually[1]. Additionally, it has been established that chronic wounds complicated by comorbidities, such as peripheral vascular disease and diabetes mellitus, tend to be polymicrobial in nature.[2] Treatment of polymicrobial chronic wounds with oral and IV antibiotics can result in antimicrobial resistance, leading to more difficult-to-treat wounds. Ideally, chronic ulcers would be topically treated with antibiotic combinations tailored to the microbiome of a patient's wound. We have previously shown that a topical collagen-rich hydrogel (cHG) can elute single antibiotics to inhibit bacterial growth in a manner that is nontoxic to mammalian cells. Here, we analyzed the microbiology of cultures taken from human patients diagnosed with diabetes mellitus suffering from chronic wounds present for more than 6 weeks. Additionally, we examined the safety of the elution of multiple antibiotics from collagen-rich hydrogel in mammalian cells in vivo. Finally, we aimed to create tailored combinations of antibiotics impregnated into cHG to successfully target and treat infections and eradicate biofilms cultured from human chronic diabetic wound tissue ex vivo. We found that the majority of human chronic wounds in our study were polymicrobial in nature. The elution of multiple antibiotics from cHG was well-tolerated in mammalian cells, making it a potential topical treatment of the polymicrobial chronic wound.

Finally, combinations of antibiotic tailored to each patient's microbiome eluted from a collagen-rich hydrogel successfully treated these patient infections cultured ex vivo.


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## ***Demographic and Socioeconomic Factors in Teratocarcinoma: An Analysis of the National Cancer Database***


Neal Sinha, Laura Stewart, Beau Hsia, Xinxin Wu, Darby Keirns, Peter Silberstein MD


Teratocarcinoma is a type of cancer that arises from germ cells, which are cells that give rise to eggs or sperm. It is a rare cancer that can form different types of tissue, such as bone, cartilage, and muscle. teratocarcinoma is most commonly found in the ovaries or testes but can occur in other parts of the body as well. While this cancer has been extensively studied, little is known about the demographics of those affected by the disease. In this study, we aimed to explore the demographics of teratocarcinoma patients by analyzing data from the 2004-2020 National Cancer Database (NCDB). We analyzed demographic variables including age, sex, race, educational status, insurance status, and distance from a facility for 64 patients diagnosed with teratocarcinoma. Our findings suggest that teratocarcinoma is more commonly diagnosed in younger individuals, with a peak incidence in the late teenage and early adult years. Additionally, we found that males are more frequently affected by teratocarcinoma than females, and that there are differences in the incidence of the disease based on race. Our study provides important insights into the demographics of teratocarcinoma and may be useful in guiding future research efforts focused on improving the diagnosis and treatment of this rare cancer.

## ***Subacute Severe Pulmonary Nocardiosis in an Immunocompetent Host***


Alexander T Sipe, MSc; Deepika Razia, MD; Phillip Leff, DO; Robert Lee, MD; Jaziel Llanes Hernandez, MD; Christine Firth, MD

Internal Medicine, Creighton University School of Medicine - Phoenix Regional Campus, Phoenix, AZ, USA



**Abstract:** Nocardiosis is a rare, opportunistic infection in the United States with annual incidence of 500-1000, it is caused by a gram-positive, acid-fast, catalase-positive filamentous, rod-shaped bacteria, typically affecting the lungs, brain, and skin. The most pathognomonic signs/symptoms associated with the infection are skins nodules/ulcers after direct inoculation in immunocompetent patients, and cavitary lung lesions in immunocompromised patients. T-cell immunodeficient hosts have an increased risk for multisystem infections. A Nocardia infection residing in the lungs is incredibly rare in immunocompetent hosts. Pulmonary nocardiosis can present with findings that mimic several other more common pathogens such as bronchial mass, cavitation, abscess, pleural effusion, and/or empyema. A potential case of pulmonary nocardiosis warrants extensive exploration of alternative diagnoses, especially in the geographical setting of the southwestern United States. Here we present such a case report of a rare finding of confirmed pulmonary nocardiosis in an immunocompetent patient after an extensive work up with an array of eliminated differentials.

## *External Validation of the Manjila and Semaan Jugular Bulb Position Classification System*

Hunt, Michelle, MD[1], Smith, Carson, BS[2], Svec, Austin, MD[1], Nanda-Vaidya, Alisha, MD[1], Christiansen, Eric, MD[1], Karis, John, MD[1], Manjila, Sunil, MD[1], Hughes, Jeremy, MD[1]
1 Creighton University, Department of Medicine
2 Barrow Neurological Institute

**Background and Purpose:** There is currently no agreed upon standard for reporting the jugular bulb anatomical position. In 2018, a study conducted by Manjila and Semaan proposed a new novel classification system for the position of the jugular bulb. Our purpose was to evaluate inter-rater and intra-rater variability of that novel classification system for the anatomic position of the jugular bulb.
**Materials/Methods:** In this retrospective study, 50 CTV examinations were collected from the Barrow Neurological Institute from August 2021 - January 2022. Examinations which demonstrated clear skull base anatomy without post-surgical changes or regional pathology were chosen. Six radiologists (2 neuroradiology attendings, 2 neuroradiology fellows, and 2 radiology residents) independently graded bilateral jugular bulb position twice. Raters were instructed to wait at least 24 hours in between rating ipsilateral jugular bulbs for the second time.
**Results:** Inter-rater Agreement kappa (κ) values for bilateral jugular bulbs and each instance of rating indicate moderate or substantial agreement. Kendall's coefficient of concordance (W), which accounts for multiple raters and ordinal outcomes, indicate either substantial or almost perfect inter-rater agreement (Table 3). Intra-rater agreement of classifications assigned by individual raters were almost perfect by kappa (κ) values for bilateral jugular bulbs and each instance of rating.
**Conclusion:** Our results demonstrate significant inter-rater and intra-rater agreement when using the classification system, indicating that the Manjila and Semaan CT-based classification system is effective for determining the anatomic position of the jugular bulb.

Table 3:

| | Kendall's Coefficient of Concordance (W) | *p*-value | Assessment of inter-rater agreement |
|---|---|---|---|
| First Left | .714 | .000 | Substantial |
| First Right | .803 | .000 | Almost Perfect |
| Second Left | .702 | .000 | Substantial |
| Second Right | .808 | .000 | Almost Perfect |

## *Delayed, Dramatic Breast Swelling in a Transgender Woman: A Case Report and Comprehensive Review of the Literature*

Szymanski, Kathryn[1]; Munabi, Naikhoba C.O.[2]; Ray, Edward[3]
Creighton University School of Medicine, Phoenix, AZ[1]
Keck Medicine of the University of Southern California, Division of Plastic and Reconstructive Surgery, Los Angeles, CA[2]
Cedars-Sinai Medical Center, Department of Surgery, Los Angeles, CA[3]

**Abstract:** One potential complication of implant-based breast augmentation is the development of periprosthetic fluid collections or seromas. Late seromas (occurring more than one year postoperatively) can result from benign or malignant conditions requiring

timely intervention. Little is known about late seroma development in transgender women, who represent a unique and vulnerable patient population. A systematic review was performed according to PRISMA guidelines using PubMed®. Full-text articles published in English discussing breast implant- associated fluid collections in cis- and transgender patients were analyzed. Of 68 full-text articles reviewed, the majority studied breast-implant-associated anaplastic large cell lymphoma (BIA- ALCL, 47.1%) or infection (19.1%) in cisgender women. Five articles (7.4%) studied transgender patients. Currently, recommendations for managing late breast-implant-associated seromas in transgender patients mirror those for cisgender patients: ultrasound, aspiration for cytology and culture, and removal of the implant and capsule if determined appropriate.
Supplementarily, a case of dramatic breast enlargement in a transgender woman two decades after implant-based breast augmentation is presented. Management followed the previously outlined recommendations. The fluid collection was determined to be a chronic hematoma and was managed surgically. Though this patient eventually achieved a good outcome, treatment was delayed due to barriers to care she faced as a transgender woman. Any patients undergoing breast augmentation with implants should be routinely evaluated for late complications, including seromas, which require prompt attention due to their potentially malignant nature. Transgender and gender-diverse patients represent a vulnerable and often marginalized population. Special attention should be given to ensure at-risk patients receive needed care.

## ***Clinical Use and Reimbursement Rates of Anesthetic Procedures in Radiologic Procedures and Radiation therapy from 2001 - 2019***

Gia Thinh D. Truong[1], Zachary A. Creech[1], Olufunmilola Adeleye[2], Matthew S. Merill[1]
[1]Creighton University School of Medicine, Phoenix, AZ
[2]Mayo Clinic Alix School of Medicine, Scottsdale, AZ

**Background:** The utilization of minimally invasive techniques and an increasing emphasis on diagnostic imaging have been introduced by technological advances for optimal management of disease processes. This trend has led to an increase in the clinical use of anesthesia outside of the operating room. The purpose of this study is to evaluate the clinical use and reimbursement rates of anesthesia in radiologic procedures and radiation therapy from 2001 to 2019.
**Methods:** A retrospective analysis was performed using publicly available Medicare Part B National data from 2001 to 2019. Current Procedural Terminology (CPT) codes for anesthesia for radiologic and radiation therapy procedures (01922) were analyzed. Total procedure volumes and true physician reimbursements for each year were collected. The monetary data were adjusted for inflation to 2019 US dollars (USD).
**Results:** From 2001 to 2019, 715,209 anesthetic services for non-invasive imaging and radiation therapy were provided in the Medicare Part B population, and a total of $66,168,353.56 was reimbursed to physicians. The number of provided anesthesia services for the given procedures in 2019 was 93,075, which is a 7.94-time increase compared to 2001 (10,412). Anesthesia utility increased by an average rate of 13% annually since 2001. The mean physician reimbursement after adjusting for inflation in 2019 ($92.19) decreased by $31.85 (25.68%) per procedure compared to reimbursement rates in 2001 ($124.04). Reimbursement rates decreased by an average of 1% since 2001.
**Conclusion:** To our knowledge, this is the first study to evaluate Medicare reimbursement trends and clinical utilization of anesthetic services for non-invasive imaging and radiation therapy. Our analysis demonstrated a significant increase in clinical utility of anesthesia. Results also demonstrated a slight decrease in physician reimbursement after adjusting for

inflation. These results demonstrate the increased clinical value of anesthesia and provide more insight into reimbursement trends for providers.

### *Comparison of Ependymoma Presentation in Pediatric and Adult Populations: An NCDB Analysis*

Tuman, Jaylin; Anderson, Quinton; Hsai, Beau; Wu, Xinxin; Silberstein, Peter, MD
Creighton University, Department of Hematology & Oncology

**Background:** Ependymomas account for 6.2% of primary brain tumors in the pediatric population. Adult and pediatric ependymomas are identical in histology, but the unique presentation in children warrants further exploration. However, there is currently limited data on pediatric ependymoma and those that it impacts.
**Methods:** Patients aged 18 and younger with a diagnosis of Ependymoma (ICD 9391-9394) were identified utilizing the National Cancer Database (NCDB) from 2004 – 2020 for a retrospective cohort analysis (N = 2,098). Demographic factors such as age, sex, and primary site were analyzed by descriptive statistics. Identical NCDB data was identified for patients over 18 years old for use as a comparison factor (N = 8,227).
**Results:** 2,098 pediatric patients were identified with an average age of diagnosis of 7.0 years (SD = 5.609). 55.9% were male and 44.1% female. The 8,227 adult patients that were identified had an average age of diagnosis of 48.8 years (SD = 15.8) with 51.6% male and 48.4% female. Most cases of pediatric ependymoma originate in the brain (91.2%), followed by occurrences on the spinal cord and cranial nerves (8.8%). This differs from ependymoma in adults where 44.8% of cases occur in the brain and 55.2% occur in the spinal cord. Pediatric patients were histologically identified as either Ependymoma, NOS (51.5%), or Anaplastic Ependymoma (47.5%). Comparatively, Anaplastic Ependymoma makes up only 9.7% of cases in adult populations.
**Conclusions:** Pediatric cases of ependymoma are not only unique in the site that they affect but also in histology, with a higher proportion of anaplastic ependymoma. This NCDB analysis is the first to specifically analyze pediatric ependymoma and fills a gap in our understanding of how this cancer presents in children.

### *Comparing Interventional Radiology Local Tumor Destruction Techniques for Rectal Cancer: A SEER Database Analysis*

Tupper, Connor;[1] Legenza, Ashton;[1] Burdyny, Michael;[1] Silberstein, Peter[2]
1 Creighton University School of Medicine, Omaha, NE, USA
2 Division of Hematology/Oncology, Creighton University Medical Center, Omaha, NE, USA

**Abstract**: Despite advances in surgical and systemic therapies, rectal cancer remains a significant health concern with many patients presenting with locally advanced or metastatic disease. Interventional radiology (IR) procedures provide a minimally invasive approach to treat rectal cancer. This study aims to compare the effectiveness and prognostic impact of different IR procedures for rectal cancer and identify the most suitable treatment strategy for optimizing patient outcomes.
**Methods**: We queried the Surveillance, Epidemiology, and End Results (SEER) database for patients diagnosed with primary rectal cancer diagnosed between 2000-2019. Patients were included if primary tumor management included local tumor destruction (LTD) via electrocautery, cryosurgery, or laser ablation, with or without excisional biopsy or polypectomy. Statistical analyses included Kaplan-Meier and Chi-square.
**Results**: A total of 16565 patients were included, of which 15005 had laser excision, 1306 had electrocautery with excision, 90 had electrocautery only, 79 had laser ablation with excision, 44 had cryosurgery with excision, 26 had LTD, 15 had laser destruction. On

Kaplan-Meier, electrocautery with excision showed better survival than LTD, electrocautery alone, laser destruction, and laser ablation with excision (p's<0.001). Cryosurgery with excision showed better survival than LTD, electrocautery alone, and laser destruction (p's<0.001). Laser excision showed better survival than LTD, electrocautery alone, laser destruction, and laser ablation with excision (p's<0.001). The one-, three-, and five-year survival rates were significantly different, likely driven by improved survival in the electrocautery with excision, cryosurgery with excision, and laser excision groups (p's<0.001).
**Conclusion**: Our analysis revealed that electrocautery with excision, cryosurgery with excision, and laser excision treatments were associated with improved survival compared to other interventional radiology techniques such as LTD, electrocautery alone, laser destruction, and laser ablation with excision. Therefore, our findings suggest that these specific IR procedures may be preferred over other approaches in the management of rectal cancer.

## ***An Unexpected Complication of Auto-Brewery Syndrome***

Jenny Xiao, BA; Rami Abusaleh, MD; Zaid Ansari, MD

**Introduction:** Auto-brewery syndrome (ABS) occurs when an overgrowth of bacteria or fungi in the gastrointestinal (GI) tract ferments carbohydrates into ethanol.1,2 Patients typically present with unexplained symptoms of alcohol intoxication.3,4 We present a rare case of esophageal varices and cirrhosis in a patient with history of ABS.
**Case Presentation:** A 70-year-old male with history of gastroesophageal reflux disease and stomach cancer status post radiation and chemotherapy 30 years prior presented with neck pain. He reported recent hematemesis and melena. Review of systems was positive for lightheadedness, vomiting, and diarrhea. Laboratory findings suggested anemia due to acute GI bleed, for which the patient was admitted.
The patient denied history of GI bleed or excessive alcohol consumption. He reported history of ABS beginning in his late teenage years for which he completed treatment but failed to seek follow up testing. He was unaware of hepatic abnormalities prior to admission.
Esophagogastroduodenoscopy (EGD) revealed no active bleeding. Multiple large esophageal varices with one high-risk stigma with nipple sign were ligated. Mild-to-moderate portal hypertensive gastropathy and small gastric varices were also found. Abdominal ultrasound showed hepatic surface nodularity with heterogeneous increased echotexture suggestive of cirrhosis, stigmata of portal hypertension, and small-volume ascites in the upper quadrants.
The patient was advised to return for repeat EGD in 4-6 weeks for evaluation of variceal obliteration.
**Discussion:** ABS is typically treated with antimicrobial therapy and lifestyle modification.1 Disturbances to gut microbiome may cause relapse, but symptoms are expected to resolve with treatment. Irreversible organ damage from chronic ethanol exposure in ABS may result, as seen in our patient without confirmed completion of therapy. Numerous cases of ABS causing hepatic steatosis have been reported. 1,5-9 Meanwhile, our patient presented with cirrhosis that led to the development of portal hypertension and esophageal varices.
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## ***Neutropenia and Necrotic Skin Lesions: An Interesting Presentation of Felty Syndrome***

Erin Yang, BS
Creighton University School of Medicine

Felty syndrome (FS) is a rare disorder occurring in the setting of chronic rheumatoid arthritis (RA) classically presenting as splenomegaly and neutropenia. This report presents an atypical case of FS with a primarily cutaneous presentation rarely described in the literature. A 58-year-old male with past medical history of diabetes and RA diagnosed in 2016 was admitted for multiple necrotic ulcers along the upper extremities, inguinal fold, left testicle, and perianal region. He was incidentally discovered to be neutropenic with an absolute neutrophil count (ANC) of 0.0. Of note, the patient had exposure to dirt and cow trough water he ingested while stranded in the desert 2 weeks prior to symptom onset. This detail raised suspicion for zoonotic infection leading to exhaustive infectious workup in our hospital as well as specialty PCR through the CDC. Throughout the 36-day hospitalization, he completed multiple empiric antibiotic courses and tested negative for all infections. Interestingly, his ANC remained unchanged even after a course of filgrastim, which prompted Rheumatology consult on hospital day 27. The diagnosis of FS was confirmed with labs showing elevated rheumatoid factor, CCP, ESR, CRP, and C3—subsequent treatment with IV prednisone followed by oral prednisone and leflunomide improved his ANC. He was discharged with oral prednisone and leflunomide. This was a unique case given the patient had neutropenia without splenomegaly and severe arthropathy classically seen in FS. His upper extremity and genital skin lesions were inconsistent with necrotizing vasculitis that can occur in FS, which typically affects the lower extremities. He also represented an atypical demographic as an older male with RA history under 10 years. These factors contributed to a delayed diagnosis of FS that was even preceded by a bone marrow biopsy to rule out malignancy. Thus, FS should be suspected in all RA patients with neutropenia.

## PARTICIPATING HEALTH SCIENCE PROFESSION ABSTRACTS:

***PD-PRIDE: Healthcare experiences of people identifying as LGBTQ+ with Parkinson disease: A qualitative study preliminary analysis***

Authors: McIsaac TL, Sutton KA, Kalcic PA, Mussack MR, Shill HA

**Objective:** To identify the lived experience and perspectives on healthcare access and equity of people with Parkinson disease (PwP) identifying as lesbian, gay, bisexual, transgender, questioning, intersex, or two-spirit (LGBTQ+) and care partners.
Background: Older adults who identify as LGBTQ+ have worse health than non-LGBTQ+ older adults. They and their care partners face greater barriers to getting healthcare and support from friends and family. This is because of lifelong stigma, discrimination, and isolation often separated from their families. There is currently little information on how LGBTQ+ PwP are coping with their disease and accessing healthcare.
Methods: Individual, semi-structured interviews were conducted over Zoom videoconferencing with a subsample of 7 participants in our ongoing study: LGBTQ+ PwP (n=5) and LGBTQ+ care partners (n=2). The planned enrollment of the study includes n=80 between interviews and focus groups. Participants were recruited through purposive sampling from rural and urban areas across the U.S. A phenomenological approach and standard thematic analysis were used to find and develop themes. Trustworthiness and study rigor were maintained by continuous revisiting of data, informal member checking, and reflexive journaling by the research team.
**Results:** Four structural themes emerged describing the impact of multiple marginalized identities on health and wellbeing: 1) Navigating a complex healthcare system; 2) Lack of representation impacting sense of belonging and respect; 3) Planning for an uncertain future; and 4) Support systems that shrink.
**Conclusions:** LGBTQ+ PwP and their care partners experience the challenges of living with PD while also balancing medical needs with sociocultural norms and expectations that do not always align with or affirm sexual orientation identity. This underlying mismatch creates added stress, isolation, and barriers to accessing optimal healthcare and support.

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