College of Allied Health Professions

Forum on Evidence-Based Medicine and Awards Ceremony

May 3, 2017
## Cardiovascular

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The College of Allied Health Professions would like to thank the faculty and staff who have contributed time and effort to the success of this Forum.
**CARDIOVASCULAR**

**ABSTRACT #1**

Longitudinal Follow up of Blood Pressure: Results from the Women Weigh-in for Wellness 30 month Trial
Patricia A. Hageman,¹ Carol H. Pullen,² Paul J. Dizona,² ¹-Physical Therapy Education, College of Allied Health Professions, ²-College of Nursing, University of Nebraska Medical Center, Omaha, NE

The purpose of this study was to examine if there were any effects of time, group (groups based on initial 6 month weight loss) and group X time interactions on systolic blood pressure (SBP) and diastolic blood pressure (DBP) at 18 and 30 months following a 6 month web-based weight loss intervention. This secondary analysis included 208 women, ages 40-69, with a baseline BMI of 28-45, who completed the 30 month trial. The 4 groups were defined by initial 6 month weight loss as substantial (≥ 10%), modest (5-9.9%), minimal (2-4.9%), or weight gain/weight stable (weight gain to ≤ 2% weight loss). Assessments of weight and blood pressure were measured at 6, 18, and 30 months. Repeated measures ANCOVAs were used for analysis, adjusting for age, blood pressure medication use, and change in weight following 6 months. Significant group differences were found (p≤0.001). Women who lost substantial weight loss (≥ 10%) by 6 months had lower SBP and DBP than other groups, and maintained the lowered SBP and DBP compared to other groups at 18 months (p ≤ 0.05). However as the substantial weight loss group had an average weight regain of 7.5% between 6 and 30 months, this group maintained a SBP advantage only over the weight gain/weight stable group at 30 months (p<0.05). Results suggests that maintaining initial weight losses of ≥ 10% bodyweight or continued modest weight loss over a 24 month period may help maintain blood pressure levels, whereas weight regain increases blood pressure.

**ABSTRACT #2**

Imaging Congenital Heart Defects
Christina Gregg, Stephanie Vas, Ellie Miller, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

One out of every 100 children is born with a congenital heart defect - an abnormal structure of the heart and/or great vessels. These numerous defects are diagnosed in utero or within the first few months of life. Imaging plays a critical component in diagnosis through identifying structural and functional defects using both ionizing and nonionizing radiation. Radiography, sonography, computed tomography, magnetic resonance imaging and cardiac catheterization each offer unique and complementary strengths for diagnosis and follow-up care.

**ABSTRACT #3**

Implications of Extracorporeal Circuit Biocoatings on Plasticizer Leaching
Madison Becker, Morgan Schmidt, David W. Holt, Clinical Perfusion Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Background: DEHP is a compound that can readily leach from plastic tubing, such as, the tubing used in cardiopulmonary bypass (CPB). DEHP is a potential carcinogen and toxic agent that can be harmful to patients and therefore, all patients that undergo CPB have an increased chance of this harm. Methods: This study used multiple biocoated tubing circuits that were then manipulated in a way to mimic CPB. Each circuit was then tested to identify the amounts of DEHP that were leached from the circuit. Results: Tubing that had no coating present showed the most leaching of DEHP. The tubing that consisted of coating resulted in the P.H.Y.S.I.O coating, which showed the most leaching out of the coated pieces. Compared to the tolerable intake value, which is approximately 0.5mg/kg/day, the results found were not significant. Conclusion: In the samples, more MEHP was found than DEHP due to how unstable DEHP is. Without knowing how long the DEHP circulated through the system before...
it converted to MEHP, it is unable to know how long the patient would have been exposed to it or how harmful that it was.

**ABSTRACT #4**

**Effects of Pressure and Gauge Size on Autotransfusion Blood**

Kailee Consbruck, Amanda Woodside, David W. Holt, Clinical Perfusion Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

**Background:** With the risks of blood transfusion well established in the medical community, the use of autologous blood products is on the rise. Clinicians and researchers have presented techniques to manipulate pressure, dilution, and flows for optimizing transfusion in time sensitive conditions. However, the application of these techniques with osmotically fragile autotransfusion blood necessitates further investigation.

**Methods:** The fragility of ATS blood was assessed per infusion of washed bovine blood, from four separate animals, through various needle sizes (16, 20, 24 gauge), under given pressures (0, 150, 300 mmHg). Measurements of plasma free hemoglobin (PFHb), potassium (K+), and hematocrit (HCT) served as indicators of hemolysis. These values were measured pre-wash, post-wash, and post-infusion.

**Results:** A type 3 analysis on PFHb, K+, and HCT for post-infusion was run comparing the fixed effects of pressure, gauge, and pressure*gauge. For PFHb results, it was determined: pressure (Pr>F=.563), gauge size (Pr>F=.568), and pressure*gauge (Pr >F=.316). K+ post-infusion results: pressure (Pr>F=.157), gauge size (Pr>F=.492), and pressure*gauge (Pr >F=.301). HCT post-infusion results: pressure (Pr>F=.807), gauge size (Pr>F=.506), and pressure*gauge (Pr >F=.631). Also a pairwise difference of the LS-means was run comparing PFHb, K+, and HCT between post-wash and post-infusion with the same fixed effects of pressure and gauge. The results were examined but not reported. The level of hemolysis was not indicative to provide an experimental basis for the clinical application of salvaged blood fragility thresholds.

**Conclusion:** The ANOVA analyses indicated no significant differences exist among levels of pressure or gauge for PFHb, K+, and HCT. The results do not support the experimental hypothesis that ATS blood fragility increases with increasing pressure and reduced gauge size.

**ABSTRACT #5**

**Utilization of an Oxygen Concentrator as an Alternate Gas Source for Cardiopulmonary Bypass**

Rachel Cope, Noelle Meyer, David W. Holt, Clinical Perfusion Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

**Background:** The function of the heart-lung machine during cardiopulmonary bypass depends on the presence of an effective gas source. During times of medical gas shutdown, oxygen tanks are utilized to provide this. In these circumstances, or when tanks are unavailable, oxygen concentrators may help to alleviate this need by providing an effective gas source that is electrically powered. The Respironics EverFlo concentrator produces a continuous flow of oxygen at 0.5-5 L/min with an FiO2 range at 5 L/min of 93% ± 3% (9).

**Methods:** A single pass oxygenator-deoxygenator system was utilized, with inline Terumo CDI sensors to monitor blood gas, hematocrit, and saturation values. A dual heater-cooler was used to maintain temperatures of 37°C. The deoxygenator side of the circuit was manipulated to venous parameters using CO2 (0.5 L/min) and N2 (14 L/min). Once the venous saturation (SvO2) reached 65%, the oxygenator was manipulated to produce arterial parameters, with a saturation (SaO2) of 100%, using tank-sourced O2 and air into a Sechrist gas blender or switched to the oxygen concentrator. Both gas sources were run at 3 L/min, resulting in a constant 1:1 gas to blood ratio. The results were recorded.

**Results:** Data collected showed that the oxygen concentrator took a longer amount of time to arterialize the blood, but had greater CO2 removal than the tank gas source. There was not a statistically significant difference in delta pO2 levels between the two gas sources.

**Conclusion:** The study shows that an oxygen concentrator provides both oxygenation and CO2 removal during simulated
cardiopulmonary bypass. It also shows that an oxygen concentrator takes a longer amount of time to achieve arterial blood gas parameters than tank sourced oxygen at the same gas flow rates.

**ABSTRACT #6**

**Bio-Coated Platelet Rich Plasma Processing Kits vs. Non-Coated**

Morgan Leder, David W. Holt, Clinical Perfusion Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

**Introduction:** Platelets are cytoplasmic fragments of megakaryocytes, formed in the marrow and contain more than 30 bioactive proteins. Many of which have a fundamental role in hemostasis or tissue healing. Seven fundamental protein growth factors that are actively secreted by platelet initiate all wound healing process. Platelet Rich Plasma (PRP) therapy utilizes these growth factors to promote healing and tissue generation (Dhurst et al, 2014). The process of PRP exposes platelets to foreign surfaces which leads to premature activation, platelet damage, and compromised function. Although anticoagulants are administered in draw syringes to prevent coagulation and premature platelet activation, blood in contact with artificial surfaces can activate the coagulation and complement glycoproteins that are often followed by activation of platelets and leukocytes (Franke, 2012). The only surface at which platelets do not adhere seems to be the surface of non-activated endothelial cells (Franke, 2012). The goal of this study is to determine if a bio-coating in PRP preparation tools will reduce contact activation of platelets and preserve platelet function.

**Methods:** Two venipuncture blood draws of 60ml each, total 120ml, will take place with a non-coated and coated needle and syringe. Each 60ml sample is then divided equally into two centrifugal tubes, one non-coated and one bio-coated. Centrifugation used to separate blood components and produce PRP. Centrepid is the PRP processing kit by Perfusion.com. Each PRP sample is tested with Thromboelastography (TEG) to measure Maximum Amplitude (MA), which indicates platelet function. Twelve volunteers will provide 24 significant mean data points (n=24) compared in a two-sided paired t-test. Study is IRB approved. TEG devices quality control tested per IFU. Limiting factors include time to bio-coat, sterilize, and re-package supplies, variation in blood draw time, and processing technique.

**Results:** Results pending completion of data collection.

**Conclusion:** Conclusion pending completion of data collection. Hypothesis states platelet function is less compromised when PRP processing kits contain a bio-coating to mimic endothelial lining.

**ABSTRACT #7**

**Renal Shear Wave Elastography**

Shane Weyrich, Erika Miller, Sydnee Freeze, Diagnostic Medical Sonography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Shear wave elastography (SWE) is a new and extremely beneficial tool that is being implemented into clinical ultrasound. SWE has the unique ability to noninvasively measure the stiffness of tissues. This technology can be applied to multiple areas in ultrasound, including the assessment of chronic kidney disease. The purpose of this poster is to define shear wave elastography, explain how it is used in the clinical setting, and discuss its use in evaluating chronic kidney disease.

**ABSTRACT #8**

**Impact of Bariatric Surgery and Diet and Exercise Counseling on Patients with Left Ventricular Assist Devices (LVADs)**

Leslie Evans, Medical Nutrition Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

**Introduction:** Obesity is a major risk factor in the development of heart failure. At the Nebraska Medical Center, heart transplantation is contraindicated in patients with a body mass index (BMI) of 35 kg/m2 and above. Left ventricular assist devices (LVADs) may be placed to prolong life or to provide a bridge to
transplantation. To help obese LVAD patients become transplant eligible with a BMI of < 35 kg/m², knowing the most safe and effective weight loss method is important.

Objectives: The primary objective is to compare the weight loss and change in BMI between LVAD patients that have had bariatric surgery to the patients who received diet and exercise counseling. Secondary analysis includes comparing infections, readmissions, heart transplant candidacy, malnutrition, vitamin status and presence of diabetes between the two groups.

Methods: A retrospective chart review was conducted of 84 patients that had an LVAD. Baseline characteristics were collected at the time of LVAD implant for all patients in the both the control and intervention group. Patients in the intervention group were then divided into the bariatric surgery group and the diet and exercise group. Clinical patient characteristics were collected to determine if significant differences between the two groups exist.

Results: During the first three months post intervention the bariatric surgery group had a decline in BMI of 5.99 kg/m² while diet and exercise had a decline of 0.17 kg/m² (p = 0.005). The BMI change at six months post intervention in the bariatric group was a reduction of 6.23 kg/m² and in the diet and exercise group was a decline of 1.26 kg/m² (p = 0.010). The bariatric group had a median decrease in weight during the three months post intervention of 17.17 kg while the diet and exercise group had a decline of 0.05 kg (p = 0.009). At six months the bariatric surgery group had a median decrease in weight of 19.78 kg and diet and exercise had a median decline in weight of 4.26 kg (p = 0.010).

Conclusion: This study found that bariatric surgery significantly decreases weight in overweight and obese LVAD patients when compared to diet and exercise counseling.

ABSTRACT #9

Aerobic exercise versus aerobic plus resistance exercise in patients with heart failure
Min Liu, Caleb Sorensen, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Purpose: This review was designed to evaluate the literature for evidence concerning which produces more beneficial cardiovascular effects in patients with heart failure: combined strength and aerobic training or aerobic training alone.

Methods: The authors searched literature databases for studies that 1) directly compared combined strength and aerobic training with aerobic training alone in patients with heart failure, and 2) used measurements regarding the structure or function of the left ventricle as a dependent variable.

Results: Three studies were selected, two of which demonstrated significant improvements in cardiovascular function in patients who participated in combined training. One study reported an increase in left ventricle ejection fraction of 18% vs 11%, and another study reported self-reported cardiac symptoms decreased 60% vs 28% in combined vs aerobic groups, respectively. The third study found no significant differences between the two training styles, although both exercise groups improved with an average increase in left ventricular ejection fraction of 3.5%.

Conclusions: While both types of exercise programs improve cardiovascular function in patients with heart failure, combined aerobic and resistance training may be superior to aerobic training alone.

ABSTRACT #10

Aortic Aneurysms: Development and Diagnosis
Megan Mihulka, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

An aortic aneurysm is a bulging of the diameter of the aorta due to a weakening in the
Aortic aneurysms are present in many individuals aged 60 and older with men being more likely than women to develop an aneurysm. Many risk factors of the disease exist including atherosclerosis, hypertension, family history, and smoking. Aneurysms have no symptoms until they have grown large enough to push on other vital structures of the body, dissect, or rupture. It is important to detect and diagnose these silent killers early on to survey their expansion in prevention of future complications. Many imaging modalities can be used to diagnose aneurysms including conventional radiographs, Ultrasound, Computed Tomography, and Magnetic Resonance Imaging, each of which have better results for different locations and implications along the aorta. Ultrasound is the modality of choice for screening patients with suspected aneurysms, along with those who have aneurysms along the abdominal aorta. Computed Tomography is chosen for better visualization of the aneurysm and its surrounding structures, along with those that have dissected or ruptured.

**EDUCATION**

**ABSTRACT #11**

Following the Growth of Sarah’s Baby: An IPE Activity for Medical Nutrition & Diagnostic Medical Sonography Students

Tanya Custer,1 Corrine Hanson,2 Cynthia Schmidt,3 Teresa Hartman,3 Elizabeth Lyden,4 Kate Wampler,1 Samantha List,5 Kim Michael,1 1-Diagnostic Medical Sonography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions (CAHP), 2-Medical Nutrition Education, CAHP, 3- McGoogan Library of Medicine, 4- College of Public Health, University of Nebraska Medical Center, Omaha, NE

Objectives: Interprofessional education (IPE) involves collaborative learning among students from different professions. While acceptance of these types of activities is increasing, there are opportunities to expand the health care professions involved in IPE. The purpose of this study was to explore student perceptions and outcomes after participation in a Diagnostic Medical Sonography (DMS) and Medical Nutrition Education (MNE) interprofessional education (IPE) activity centered around a clinical case study on fetal growth.

Subjects & Methods: Participants included 15 students: 9 from the DMS and 6 from the MNE program. Data was gathered through pre- & post-tests based on a patient case-study and evidence-based search skills knowledge, faculty observation during the activity, and a post-activity survey and debriefing. Assessment sessions were held on the first day and on the last day of the activity.

Results: There was a statistically significant difference in the mean pre-and post-test scores for the group overall, (p=0.0005), and for each group by discipline (p=0.04 for both student groups). Student perceptions of IPE were positive as measured by a quantitative survey and qualitative feedback.

Conclusion: This activity highlighting fetal growth was an effective strategy for engaging sonography and nutrition students in IPE.

**ABSTRACT #12**

Introduction of IPE Core Competencies through a Non-Medical Teamwork Activity in Early Phase Physician Assistant Education

Anne Wildermuth, Wayne Mathews, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Background: We examined the efficacy of the replicable activity Zoom© in introducing IPE Core Competencies in early physician assistant education and measured student perception that this activity effectively utilizes skills that are required for several focused areas of clinical practice.

Methods: Following completion of the Zoom© activity in small groups of 10 or less, we utilized a 14-question anonymous survey that focused on the efficacy in teaching several of the IPE core competencies as well as potential applications in clinical practice based on a 5-point Likert scale. Successful utilization of the activity was determined by an end-point of agree or strongly agree responses to the survey.

Results: We achieved a 100% completion rate of the survey, and all 56 student responses were included in analysis. All 14 of the questions received a combined agree and
strongly agree score of 75% or better, and several questions, specifically those focusing on accurate communication and valuing every group members’ opinion, received scores over 90%.

Conclusions: The Zoom© small group activity is efficacious in the introduction of IPE Core Competencies in early physician assistant education, and physician assistant students perceived the activity to be applicable to several clinical scenarios.

ABSTRACT #13
Promoting Student Success in the Clinic through Collaboration: A Novel Approach to Clinical Performance Instrument Review
Nikki Sleddens, Betsy Becker, Joseph Norman, Grace Johnson, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Objective/clinical relevance: A student is more likely to successfully complete a clinical internship if issues are identified early and mentoring is implemented promptly. For this to occur, a thorough examination of the CPI must be completed within a limited timeframe. Therefore, assessment of student performance must be conducted in a rapid and thorough manner to address improvement areas or to intervene with remediation plans. A novel approach was created to review student clinical performance assessments.

Therapists with a given expertise often assist with didactic teaching and assessment of students. Likewise, select CCCEs were recruited for their expertise in reviewing students’ CPIs.

Methods: This approach includes 1) collaboration with clinical education faculty for review (CEFR) of CPIs; 2) communication between DCE and CI; 3) review of student assessment with the Clinical Education Team.

CEFRs completed a training session delivered by the DCE and signed a non-disclosure agreement. Subsequently, CEFRs reviewed CPIs on campus with the DCE providing additional guidance. To ensure quality control, the DCE audited CPIs from each CEFR. Because the audit revealed no concerns, CPIs for the next clinical internship were completed off-site.

At midterm, the DCE scanned each CPI, examined any CPI flagged by a CEFR, and followed up with the CI and student for mentoring or remediation. At final, the DCE examined CPIs with concerns noted at midterm and/or an issue expressed by a CEFR, student or CI.

Results: This approach was used successfully for 4 full time clinical experiences using the same 4 CEFRs. Each CEFR reviewed 10-12 students. The DCE reviewed CPIs of students requiring additional attention based on potential or known issues. All CPI reviews were completed within 2 days of submission. When a student issue arose, the DCE intervened quickly. Students doing well received timely positive feedback to reinforce behaviors. The CEFRs reported high satisfaction with the experience.

Conclusion: Collaborating with clinical faculty to manage student performance assessment provides students and CIs with timely feedback promoting student success. After 2 years of use, this strategy has proven to be effective, cost-efficient and successful in optimizing the management of students on clinical rotations.

ABSTRACT #14
Vidyo in the Classroom: Students’ Tips for an Improved Educational Experience
Allyson Huntley, Kelsey Rutt, Diagnostic Medical Sonography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

In the fall of 2015, five programs from the College of Allied Health Professions expanded to UNMC’s new Health Science Education Complex located on the UNK campus in Kearney, Nebraska. The goal of the expansion was to help address the shortage of health care professionals in Nebraska by making the educational programs more accessible to students in central and western Nebraska. Although UNMC’s Omaha and Kearney campuses are approximately 200 miles apart, classes are taught synchronously through the use of Vidyo, a video conferencing platform. This technology allows students to remain in their community and interact in real time with their classmates and instructors. With faculty at both locations, the classes alternate as the distance site.
ABSTRACT #15

Perceived Value in Sources of Feedback and Conducting a Peer Review as Part of a 360 Degree Assessment
Taylor Johnson, Sara Bills, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Objectives: The primary aim of this study was to determine students’ perceived value of various 360 degree feedback sources in a second year doctor of physical therapy (DPT) cardiopulmonary course. The secondary aim was to investigate what students gained from the act of performing a peer review as part of the 360 degree process.

Methods: This was a retrospective qualitative study. As part of their course curriculum, students were required to complete a chest exam on a standardized patient, receive 360 degree feedback regarding their performance, and to watch and review a peer’s performance. Students gave each source of feedback a numerical rating relative to their perceived benefit and then filled out an open ended survey about their perceptions of the peer review process. Fifty surveys were obtained from the 2013 school year for this study. The surveys were imported into NVivo software in order to identify and code main themes.

Results: Students identified their professor as the most helpful feedback source. The themes identified in the surveys included validation, evaluation, self-reflective, and comparative statements. Within the two themes of evaluation and self-reflective statements the subthemes of statements regarding professionalism, rapport building techniques, exam technique, and exam efficiency were identified. The most common themes the students acknowledged they gained from performing a peer review were professionalism and rapport building techniques.

Conclusion: While students valued feedback from their professor the highest, they learned professionalism and rapport building techniques from watching and reviewing their peers. Both professionalism and rapport building behaviors are difficult to teach in the classroom, and using the peer review process can be a novel strategy to increase a student’s concept and understanding of these behaviors within the context of their profession.

ABSTRACT #16

Filling the gap—Clinical skill acquisition with interactive online modules to supplement traditional instruction
Keriann Shaw,1 Betsy J. Becker,1 Nicole Sleddens,1 Robin High,2 1- Physical Therapy Education, College of Allied Health Professions, 2- College of Public Health, University of Nebraska Medical Center, Omaha, NE

Online resources have become highly favored to augment learning for convenience and versatility in learning styles. It has been reported that e-learning content may be as effective as traditional instruction, but there is a deficiency in the literature regarding physical therapy education. The purpose was to assess the effectiveness of e-learning modules to supplement traditional instruction for range of motion (ROM) skill acquisition in a doctor of physical therapy (DPT) curriculum by analyzing pass rates, confidence, usage, and student satisfaction.

This was a prospective cohort study in which e-learning modules supplemented 4 labs in the fall of 2015. Fifty-two students were randomly divided into 2 groups with access to either upper or lower extremity modules and were assessed with a lab practical. Students rated confidence on a 10-point scale and self-reported module usage was confirmed by the learning management system. Student satisfaction was measured using end of semester course evaluations. Chi-square tests and logistic regression were used for analysis (α = 0.05). Data was analyzed from 44 students. Eight were excluded (6 did not using the modules, 1 had previously taken the class, 1 viewed modules not of their assigned group). There were no differences between groups for gender, age, race, usage, and confidence. The average module usage per student was 2.4 hours. Confidence increased from 4.3/10 to 9.0/10. There were no significant differences between groups in the first time lab practical pass rate (p=0.30). The overall first time lab practical pass rate was 71% in 2015, 47% in 2014, and 63% in 2013 with a significant difference between 2015 and 2014 (p=0.02). Student satisfaction results indicated 78% reported appropriate interactivity, 80% wanted access beyond the semester, 76% said it helped them learn, and 85% recommended using them in the future.
In conclusion, the modules were well utilized, increased student confidence in ROM examination skills, and received high satisfaction ratings. There were significant improvements in first time pass rates from the previous year when the modules were not available. The results support the use of interactive e-learning modules to supplement ROM clinical skill acquisition in a DPT curriculum.

ABSTRACT #17

Cultural Competency: Considerations Towards Achieving Effectiveness among Imaging Science Professionals
Mayra Barbosa, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

This poster highlights the health disparities that occur among minorities in the United States, emphasizing more on the Hispanic and Latino demographic and the steps that are being taken towards decreasing or eliminating them. Population statistics such as education level, income level and health insurance access were looked at to see where the disparities originate. Trainings, seminars, retreats, and being involved in mock trainings where physicians are exposed to individuals of diverse backgrounds can help them practice and further develop their skills toward achieving cultural competency among minorities. Hiring professional interpreters is a necessary resource that is provided for and by physicians to achieve proper care and eliminate health disparities. Positive attitudes and behaviors when in contact with patients will further allow for diminishment of disparities that minorities face when seen in clinics and hospitals.

ABSTRACT #18

Benefits of Weight Bearing Lumbar Spine Radiographs
Christina Gregg, Ellie Miller, Tammy Webster, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Weight bearing radiographs of the lumbar spine allow radiologists to visualize how the spine looks when patients are in a more natural, true position. With the patient standing, radiologists and physicians can evaluate the gravity dependent forces that affect the spine. Benefits of performing weight bearing lumbar spine radiographs may include an evaluation of vertebral instability as well as a number of lumbar spine pathologies. Recumbent lumbar spine radiographs, may miss lesser degrees of anterolisthesis and/or retrolisthesis. Weight bearing lateral radiographs also demonstrate indirect signs of spondylolysis, including contralateral reactive sclerosis, wedging of the posterior vertebral angle, degenerative changes of the facet joints and disks and other associated anomalies. In addition to identifying structural and postural spinal pathologies not visualized in the recumbent position, weight bearing radiographs can also prevent false positives in postural pathology. Properly performed weight bearing radiographs of the lumbar spine can diagnose multiple pathologies in a timely manner. Vertical instability is believed to be a major cause of low back pain and is often an important factor in the determination of needed surgical intervention.

ABSTRACT #19

Medical Imaging and Treatment of the Jones Fracture
James B. Temme, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

The Jones fracture was first described in 1902 by Sir Robert Jones while dancing. Dr. Jones was a Welsh orthopedic surgeon who helped to establish the modern specialty of
orthopedic surgery in Britain. He was an early proponent of the use of radiography in orthopedics.

Jones’ fractures occur in a small area of the proximal fifth metatarsal that receives less blood and is therefore more prone to difficulties in healing. A Jones fracture can be either a stress fracture (a tiny hairline break that occurs over time) or an acute (sudden) break. Jones fractures are caused by overuse, repetitive stress or trauma. They are less common and more difficult to treat than avulsion fractures. Symptoms of the Jones fracture include: pain, swelling and tenderness on the outside of the foot, difficulty walking and bruising. The diagnosis and treatment will be presented in this scientific exhibit.

ABSTRACT #20

Imaging Osteoporosis
Abby Core, Magnetic Resonance Imaging program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Osteoporosis is a disease that affects bones causing them to become weak, brittle, and easy to fracture. This disease is characterized by a low bone density and deterioration of bone tissue. There are two different types of osteoporosis: primary and secondary. There is a total of four different imaging modalities that can be used to help diagnose primary and secondary osteoporosis: conventional radiographic, dual x-ray absorptiometry, magnetic resonance imaging and computed tomography. Although each of the different imaging modalities has its unique advantages and disadvantages in relation to imaging osteoporosis, the best imaging modalities for diagnosing osteoporosis is conventional radiography and dual x-ray absorptiometry (DXA).

ABSTRACT #21

Osteogenesis Imperfecta
Braya Prince, Magnetic Resonance Imaging program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Osteogenesis imperfecta (OI) is a genetic disease that causes very brittle bones. The fragility of the bone structure leads to multiple fractures throughout a person’s life as well as many other complications. OI is often inherited from parents. There are various types of OI, which generally classify the severity of the disease. Osteogenesis imperfecta affects the skeletal system as well as other organs and systems throughout the body. It is the product of a deficient amount of collagen produced by the body. Death can occur in some cases, which is often due to respiratory failure. In detail, this paper describes what OI is, the cause, signs and symptoms, diagnostic testing, treatment, and prognosis of the condition. It also includes the importance of healthy living in those who suffer from the disease.

ABSTRACT #22

Which ACL Reconstructive surgery is right for you: Bone Patellar Tendon Bone Graft vs. Semitendinosus Gracilis Tendon
Lindsay Peterson, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

It is clear in medicine that an anterior cruciate ligament (ACL) injury is best treated with reconstructive surgery, and the trend of reconstructive surgery is certainly rising, according to a level 3 evidence 21-year population based study done in 2010 as seen in Table 4. Graft choices for ACL reconstruction include the bone patellar tendon bone autograft (BPTB), semitendinosus gracilis hamstring autograft (STG), quadriceps autograft, allografts, and synthetic grafts. Return to sports after surgery was significantly quicker in patients receiving autografts6, but how should you choose between the two most common autografts available: BPTB or STG? Although the BPTB has been the “gold standard” for many
decades, a careful analysis of several randomized controlled trials comparing the
BPTB and STG autograft have revealed that there are only minimal differences in the long
term effectiveness between the two grafts. Furthermore, in a 10 year controlled prospective
study done in 2007, knee stability, laxity by KT-1000 arthrometer, and range of motion were
assessed with no significant differences. However patients receiving the BPTB autograft
had significantly more anterior knee pain upon kneeling, seen in Figure 6, and higher rates of
osteoarthritic changes on radiography. Other studies mirrored the result of increased anterior
eknee pain and osteoarthritides with BPTB autograft. In comparison, a cross-sectional
case-control study revealed lower hamstring:quadriceps ratio of muscle power in
patients receiving the STG autograft which is a very important observation as the hamstrings
serve as an ACL agonist in functionality and stability. There is no clear answer as to which
graft is better, and ultimately the decision should be based on patient preference as well as
surgeon preference and experience. Study Quality Level 1 – Strength of Recommendation A.

ABSTRACT #23

Optic flow and inclination affect the peak of ground reaction force and its variability in
treadmill walking
Jung Hung Chien, Jonathan Hall, Chun-Kai Huang, Ka-Chun Siu, Physical Therapy
Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Incorporating optic flow into treadmill rehabilitation has shown promising improvements in gait, and inclined walking on a treadmill could enhance the proprioceptive function. Therefore, in the current study, we examined the impact of optic flow and inclined walking on gait performance, especially in the peaks of the ground reaction force (GRF) and its variability during treadmill walking. Twelve healthy young adults participated in this study. We applied a 2 (with or without optic flow) by 2 (inclination of 6 degrees or no inclination) statistical model to test our hypothesis that optic flow and inclined walking would impact the GRF more than optic flow alone. The results confirmed that inclination increased the peaks of GRF, particularly in the push off phase, to generate larger force to move the leg from a low to high position in both the anterior-posterior and vertical directions in comparison with level walking. Moreover, the increasing amount of time to peak GRF variability allowed young adults adapt to weight acceptance during inclined walking. Moreover, optic flow plus inclined treadmill walking significantly reduced the peak of GRF and time to peak variability in push off. These results suggested that using optic flow plus inclined treadmill training might be beneficial for rehabilitation for patients with pathological gait.

ABSTRACT #24

The use of continuous passive motion machines is not more effective than conventional physical therapy in improving outcomes after total knee arthroplasty
Neleigh Frandsen, Melissa Parks, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Total knee arthroplasty (TKA) is a common orthopedic procedure performed today in patients experiencing knee pain and loss of function due to end-stage osteoarthritis. The use of continuous passive motion (CPM) machines following this procedure remains common practice in many hospital and rehabilitation settings; however, the benefits of using these devices have become controversial, as these machines naturally promote passive bed-based approaches to therapy. This review appraised the research regarding the effectiveness of CPM machines versus conventional physical therapy interventions in improving knee range of motion (ROM) and function in postoperative TKA adults. Three research studies were evaluated based on reliability, validity, bias, methodology, and reproducibility features. Other than a couple short term and sporadic benefits seen with CPM treatment in the acute hospital and inpatient rehabilitation settings, results overwhelmingly supported the decision to discontinue the use of standard CPM protocols following TKA surgeries. Researchers demonstrated no consistently added benefits with CPM device usage over traditional physical therapy in multiple cases, plus the addition of numerous
costs for the patient and hospital in time and money resulted. Also, greater wound staining and joint swelling was observed in CPM groups over controls, indicating an even harmful effect in some cases. The costs and risks of CPM use in conjunction with the shown marginal benefit associated with the treatment should bring into question the continued use of this device in postoperative TKA care today.

ABSTRACT #25

The Spatiotemporal Gait Adjustments during a Virtual Obstacle Crossing Task in Adults with Diabetes
Chun-Kai Huang, Vijay Shivaswamy, Pariwat Thaisetthawatkul, Lynn Mack, Ka-Chun Siu, 1
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The neuromuscular control in patients with diabetes mellitus (DM) deteriorates over time and develops diabetic peripheral neuropathy (DPN). Patients with DPN demonstrated a prolonged reaction time, poor postural control, and a high risk of falling or tripping. Therefore, this study aimed to compare the different motion executions conducted in DM, DPN and age-matched healthy group by investigating the gait adjustments while being confronted with forthcoming virtual obstacles. Eleven Type 2 DM, 10 DPN and 11 age-matched healthy adults (HTY) were recruited to perform a virtual obstacle crossing task (OCT) which was projected ahead using the D-flow software. Subjects were instructed to step over the virtual obstacles starting with their dominant leg. After a familiarization of six-minute treadmill walking at the self-selected pace, subjects completed ten virtual OCT on the treadmill. Three-dimensional spatiotemporal gait characteristics including maximal toe elevation (MTE) of dominant leg (before, during, and after crossing event) were collected using VICON motion capture system at 100 Hz and calculated using MATLAB. For comparing the between-group difference, the Kruskal-Wallis one-way analysis of variance by ranks test was adopted for testing the within factor difference (i.e. phase effect) following by Wilcoxon signed-ranks test as multiple comparisons. DPN showed the lowest OCT successful rate than HTY (by 15%) and DM (by 2%). In the spatial gait domain, DM showed a significantly decreased in the leading MTE when compared to HTY during the crossing phase of OCT. In the temporal gait domain, DPN showed a significantly increased stride time and stance time in the recovery phase when compared to the HTY. Concerning the variability, DPN and DM significantly decreased their step length variability when compared to HTY in the recovery phase. DPN demonstrated prolonged temporal gait characteristics in the recovery phase of OCT and which could be inferred as a compromised top-down neuromuscular control. The reduced step length variability can be explained as both DM and DPN tended to be more rigid (less varied) in gait and cautious after the event of OCT to retain their dynamic balance.

ABSTRACT #26

Outcomes of Non-operative Compared to Operative Treatment for Acute ACL Injury
Danielle Nelson, Brittni Klostermeyer, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Objective: The purpose of this critical review was to investigate subjective outcomes of patients after non-operative and operative treatment for ACL injuries.

Clinical Relevance: ACL tears are a common knee injury and account for 45.4% of sustained internal knee injuries. Surgical reconstruction has traditionally been the preferred treatment approach; however, there are situations where non-operative treatment is a better option for the patient, such as when they have lower activity level goals.

Methods: Two randomized control trials and one case series were chosen that compared subjective patient outcomes for non-operative and operative treatment of ACL tears.

Results: Two studies found no differences in subjective outcomes between non-operative and operative treatments. The first study found no difference between International Knee Documentation Committee
subjective form (IKDC), Lysholm, and Tegner Activity Scale scores at a follow-up of 15 years after baseline evaluation. The second study found no differences in Knee injury and Osteoarthritis Outcome Score (KOOS), Medical Outcomes Study Short Form 36 (SF-36), and Tegner Activity Scale scores between groups at a five-year follow-up. The third study found the surgical reconstruction group had higher International Knee Documentation Committee subjective form and Tegner Activity Scale scores at a follow-up of ten years.

ABSTRACT #27
Effects of Open Kinetic Chain Exercises in the Acute Phase of Anterior Cruciate Ligament Reconstruction Rehabilitation
Marissa Kovanda, Elizabeth Damman, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

The anterior cruciate ligament (ACL) is an important primary stabilizer of the knee. The choice of intervention following ACL injury and reconstruction has been debated without resounding consensus. Professionals have disputed whether open kinetic chain (OKC) exercises cause increased strain and laxity on the surgically-reconstructed ligament as compared to closed kinetic chain (CKC) exercises. OKC exercises are frequently prescribed in the later stages of rehabilitation in order to preserve healing of the ACL graft. However, there are no consistent results as to whether CKC or OKC exercises promote a more effective and timely rehabilitation process. This critical review appraised studies on the comparison of using OKC versus CKC exercises in the acute phase of rehabilitation after ACL reconstruction in order to determine their impact on knee function.

Three randomized, controlled trials were evaluated from leading journals in sports medicine. Each study was reviewed and included in order to maximize reliability and reproducibility.

Many variables play a role in returning to activity after ACL reconstruction, including range of motion, joint laxity, and muscle power. The articles included in this critical review measured these variables before and after implementing either OKC or CKC exercise to participants after ACL reconstruction. Therapy occurred as early as two weeks post-operatively. Comparisons found no significant differences in range of motion, joint laxity, or muscle power between the OKC and CKC groups. However, OKC exercise groups did show more improvement in range of motion during stair ascent. In conclusion, both OKC and CKC exercises can and should be included in acute rehabilitation phases after ACL reconstruction. Nonetheless, further study is needed to determine long-term outcomes and to improve the clinical significance of these interventions.

ABSTRACT #28
The effectiveness of dry needling in patients with back pain
Brittney Mozer, Kaitlyn Gillett, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Objective: The purpose of this critical review was to investigate the effectiveness of dry needling (DN) compared to manual therapy (MT) and exercise as a treatment for reducing back pain.

Clinical Relevance: Back pain is a common diagnosis in the physical therapy setting. There is not one specific protocol established to treat back pain because of the various etiologies. MT and exercise is a common treatment for back pain, but DN is an emerging technique in physical therapy.

Methodology: Four randomized controlled trials that involved DN or MT and exercise for the treatment of back pain were selected and critiqued.

Results: All four studies showed improvement in back pain with DN or MT and exercise. In the first study the DN group had significant improvements in their pain compared to the sham DN group post intervention. The second study found that at three weeks after intervention the DN with active stretching group had significant improvements in pain compared to the no treatment group and the stretching group. The third study reported that significant improvements in pain were found in the MT group and exercise group from pre to post-treatment and this was maintained one-year later. However, significantly larger improvements in pain were found in the MT group compared to
the exercise group at all post-treatment sessions. The last study found an immediate analgesic effect in the MT group with active stretching compared to the sham group. They also found a larger decrease in average 48-hour pain intensity in the MT group with active stretching, but this was not significant compared to sham group.

Conclusion: The critically reviewed studies showed clinically important improvements in pain with subjects who underwent DN or MT and exercise. This justifies the utilization of both DN and MT and exercise for patients with back pain. Long-term improvements in pain occur following MT and exercise. However, long-term pain outcomes have not been studied in DN so these benefits are unknown. In conclusion, it is inconclusive whether DN is superior to MT and exercise in reducing overall pain over the long-term in patients with back pain.

ABSTRACT #29
Cerebral Palsy Gait Mechanics Corrected with an AFO
Katie Shalon, Elizabeth Sittig, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Cerebral Palsy (CP) describes a group of non-progressive disorders of movement that causes activity limitations which can be connected to disruptions in the brain before or after birth. Secondary musculoskeletal problems such as spasticity and rigid postures pose problems for children with CP when they start to ambulate. Prescribing AFO’s is common practice for treating children with both diplegic and hemiplegic CP. The purpose of this critical review was to collect data from multiple research articles to determine the best clinical practice for whether AFO’s are advantageous in improving ambulation characteristics in children with CP. A literature search was completed on MEDLINE via PUBMED, Google Scholars, and EBSCOhost-CINAHL with these key terms: AFOs, cerebral palsy, and gait analysis. This research reviews three studies that evaluated the efficacy of AFO’s on correcting gait mechanics. Articles were chosen based on the use of barefoot condition as the control, sample size and outcome measures that include gait parameters such as walking speed, stride length, stance time, or swing time. All three studies were reviewed by the PEDro scale to determine strength. The use of AFO’s increases stride length and walking speed in patients with both diplegic and hemiplegic CP when compared to their own barefoot gait patterns, implying that the AFO are beneficial in improving these two gait parameters. Because these studies didn’t group children based on gait patterns or upon the type or tuning of AFO, further research needs to be conducted to determine effectiveness of AFO’s in more specialized populations.

ABSTRACT #30
Is a mobilization with movement technique effective in reducing pain and increasing pain-free grip strength in patients with lateral epicondylalgia?
Trent Werner, Brian Wanser, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Lateral epicondylalgia is a musculoskeletal condition encountered by physical therapists involving pain at the lateral epicondyle of the humerus. It is commonly attributed to overuse of the wrist extensors that leads to degenerative musculotendinous changes, which can decrease a patient’s functional capacity and quality of life. The literature to date has assessed many physical interventions on various outcomes for lateral epicondylalgia and failed to elucidate a superior method. This paper reviewed the available evidence for the inclusion of the mobilization with movement (MWM) technique, a manually-sustained lateral glide of the elbow paired with eccentric muscle contractions, in a physical therapy (PT) protocol and whether it is beneficial for a patient with lateral epicondylalgia in reducing pain and increasing pain-free grip strength.

Three research articles were reviewed and critiqued for reliability, inclusion/exclusion criteria, bias, reproducibility, validity, and applicability to the purpose of our critical review. In general, a multimodal PT treatment protocol that includes the MWM technique is beneficial in reducing pain and increasing pain-free grip strength in patients with lateral
epicondylalgia, as well as increasing global improvement and quality of life scores, both in the short term and in the long term. Other interventions, such as corticosteroid injections (more beneficial in the short term but more detrimental in the long term) and a “wait-and-see” approach including patient education (similar to PT in the short term and in the long term) are also common for this condition. The similar long-term outcomes of PT including MWM and a wait-and-see approach reflect the natural history of the condition. Lateral epicondylalgia is a self-limiting condition; therefore, the majority of patients with this condition eventually have complete recovery at one year from onset, regardless of treatment chosen. However, the beneficial effects of PT including MWM over injections and wait-and-see in the short term and lack of recurrence or negative side effects in the long term indicate that PT including MWM is an effective and appropriate treatment for lateral epicondylalgia.

**ABSTRACT #31**

**Achondroplasia**

Tori Bailey, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Achondroplasia is among the most prevalent form of chondrodysplasia in the United States. Research and awareness in an effort to discover more information about this condition has continuously grown with increased medical advantages. Although this condition most often develops spontaneously, preventative steps and the minimization of complications have more recently developed. The purpose of this research is to identify multiple radiologic modalities used to effectively diagnose achondroplasia, assess radiologic findings based on abnormal development of anatomy, and to recognize the cause and treatment for individuals diagnosed with this rare illness.

**ABSTRACT #32**

**Child Abuse: Radiographically Speaking**

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In 2014, 702,000 child abuse cases were reported to the CPS. In a non-CPS study, research showed that as many as 1 in 4 children experienced or will experience child abuse or neglect before 18 years old. Medical professionals are many times the first line of defense and should be taught the correct actions to take in child abuse and neglect situations. As a radiologic technologist, it is important to get superb diagnostic quality imaging for the radiologist and the ordering physician to decide if the child may be getting abused. Normal bone anatomy, along with imaging protocols are a must for the technologist. Due to the child abuse imaging likely ending up in court proceedings, images must be complete and marked with the appropriate information. History must be thoroughly obtained and documented due to this likelihood as well. Age-appropriate communication must take place and adapted to each patient and each case. If there is conflicting information or something is said by the child or parent, it is the technologist’s duty to report it to the ordering physician or radiologist.

**ABSTRACT #33**

**Idiopathic Scoliosis**

Courtney Palmer, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Scoliosis is a deformity of the vertebral column in which there is a curvature of 10 or more degrees. While scoliosis may be present at birth, it can furthermore be idiopathic, or caused by other pathologies. This condition is diagnosed during a physical, and diagnosis is confirmed using radiographic imaging. Treatment options include observation, bracing, and surgery. The specific type of treatment given is dependent on the patient’s age and the
amount of curvature in the patient’s vertebral column. This review evaluates literature that concerns the causes, signs, symptoms, diagnosis, and treatment of idiopathic scoliosis.

ABSTRACT #34

The Most Effective Way to Diagnose and Treat ACL Injuries
Matt Spaulding, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

The anterior cruciate ligament (ACL) is a tendon within the knee joint that is vital to the stability and longevity of the knee. The ACL originates from the base of the posterior femur and extends through the knee joint to attach to the anterior tibia. This keeps the femur from sliding too far anterior when the leg is planted. MRI is the modality of choice when imaging for a tear in the ACL. Different image weightings will show different structures within the knee. In imaging for a torn ACL both T1 and T2 images will be required. The two surgical options used to repair a torn ACL are the Allograft and the Autograft. The allograft is a surgical repair done with a replacement tendon that is pre-prepared before the surgery. Conversely, the autograft is that same surgery done, but the tendon is harvested from the same patient. Autograft tendons are usually harvested in the same surgery that they are applied to the patient in, which can lend itself to longer surgical times.

NEUROLOGIC

ABSTRACT #35

Gadolinium: New Risk Revealed?
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Gadolinium-based contrast agents (GBCAs) are commonly used in magnetic resonance imaging (MRI) examinations. These agents decrease the T1 relaxation time of tissues, which provides increased signal intensities on T1 weighted images. The increase of signal intensities allows for optimal visualization of pathological processes. Past research found that the administration of GCBAs in patients with decreased kidney function could lead to nephrogenic systemic fibrosis. Despite that finding, GCBAs have been believed to be safe for patients with normal renal function; however, new research has revealed that some GBCAs may be retained by the patient’s tissues long after administration.

ABSTRACT #36

Improving Stroke Rehabilitation across the Continuum of Care: Triangulating Perspectives of Interprofessional Groups of Healthcare Providers in Nebraska
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Purpose: The purpose of the study was to 1) identify and describe rural healthcare professionals’ perceptions of stroke rehabilitation in rural Nebraska communities; and 2) develop a framework for educating health care professionals about the role of interprofessional teamwork in stroke rehabilitation.

Methods: As a follow up to a previous study of stroke rehabilitation in Nebraska hospitals in 2010, we conducted 5 focus groups from four regions of Nebraska consisting of 22 rural stroke rehabilitation professionals from occupational therapy, physical therapy, speech and language therapy, social work, case management, and nursing. We used qualitative methods using a grounded theory approach to draw meaningful conclusions from these interviews with regard to questions about the team approach, standardized assessments, specialized services, discharge planning, and unmet needs of rural stroke survivors/families.

Results: Stroke rehabilitation professionals identified the need for a shared mental model among team members in terms of using a common language, interpretation of standardized assessments, and setting patient goals which achieve ICF Activity and
Participation levels. Second, they identified a need for standardized protocols for decision-making and discharge planning such as access to standardized assessments and information about them. Third, they identified limited access to specialized services as a barrier to stroke rehabilitation.

Conclusion/Clinical Relevance: The findings of this qualitative study enhanced our understanding of existing structures and processes of rural stroke rehabilitation, strengths of and challenges to rural communities for provision of stroke rehabilitation, barriers to resources, and possible solutions to barriers to team-based rural stroke rehabilitation. Educational outcomes from this study include 1) two continuing education courses provided for physical and occupational therapists, 2) a list of evidence-based standardized assessments and their interpretation compiled by the Nebraska Stroke Advisory Council (NSAC) Rehabilitation Task Force, an interprofessional group of stroke providers who focus on development of resources and education of Nebraskans on stroke rehabilitation; and 3) a specialized services directory which identifies services used by stroke rehabilitation professionals and patients/families in Nebraska. The standardized assessments list and services directory are published on the NSAC website at www.nestrokecouncil.org.

ABSTRACT #37
Placement on Weight Loss in Patients with Amyotrophic Lateral Sclerosis
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Background: Amyotrophic lateral sclerosis (ALS) is the most common form of motor neuron disease. Nutrition implications for this disease are vast due to factors like dysphagia and hypermetabolism resulting in malnutrition and potential need for artificial nutrition and hydration. A current gap in the research exists regarding whether or not tube feedings will help slow weight loss and prolong time to mortality.

Purpose: The purpose of this study was to determine if percutaneous endoscopic gastrectomy (PEG) placement slowed the time to mortality and led to weight stabilization or decreased weight loss in patients with ALS receiving care at Nebraska Medicine ALS Clinic.

Methods: In this retrospective chart review, data was collected on 90 ALS patients currently receiving ALS care at Nebraska Medicine or that have received care in the past 3 years. Data was collected on weight, forced vital capacity (FVC), and level of dysphagia at time points of every 3 months from initial visit to final visit or mortality.

Results: Of the 90 total patients, 44 had no PEG and 46 had a PEG. On average, those with a PEG feeding time had a survival time one month greater than those without, but the result was not statistically significant. With a statistical significance of p<0.001, a higher proportion of patients with a PEG tube expired compared to those without. Overall, mean weight loss from initial visit to final visit was greater in the PEG group compared to the non-PEG group, (-7.08 kg lost compared to -2.35 kg, p=0.013). FVC was 30 points lower at the final visit in the PEG group (p<0.001). Mean time to PEG tube placement was 8 months from initial appointment, with the PEG group having already lost a greater amount of weight compared to the control group before tube placement.

Conclusion: Many factors continue to impact weight loss, time to mortality, and PEG tube placement in ALS patients. A decreased FVC and increased weight loss at the final visit show PEG use may be associated with disease severity but that placement may be too late in disease progression to allow for repletion of body mass.

ABSTRACT #38
Neurological Impact of Depression
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Depression is a prevalent and concerning disease within our community that affects a person’s personality, work performance, relationships and overall sustenance. Symptoms of depression include loss of interest and pleasure, attention deficits, cognitive impairment and suicidal ideation. The pathogenesis of depression and its correlation
with ensuing symptoms can be observed through the technological advances of Magnetic Resonance Imaging (MRI). MRI studies have consistently shown signs of neurological degeneration in correlation with depression duration.

**ABSTRACT #39**

**Functional Magnetic Resonance Imaging (fMRI): Neural Correlates of the Emotional Brain**  
Kaleigh Petekavich, Magnetic Resonance Imaging, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Functional magnetic resonance imaging (fMRI) is a rather new technology developed in the 1990s. It utilizes technology to identify different areas of the brain that have increased oxygen levels. These regions with increased oxygenation are activated when stimuli are introduced, and the brain reacts to it. These stimuli can be presented in a multitude of ways, but most research studies included in this paper utilized a technique called autobiographical recall. The brain itself is a dynamically complex organ with a multitude of functions for each area of the brain. Throughout those areas are different emotional aspects, which is the focus of this paper. Correlations between specific brain regions and emotions are explored more in depth in the paper and illustrations are given for better visualization. Many of these emotions correlate with multiple areas of the brain, rather than just one, therefore yielding neural configurations instead. Though the technology is still rather new, there have been significant strides towards identifying all the emotional aspects of the human brain with fMRI.

**ABSTRACT #40**

**The Sacred Disease: The History of Epilepsy and Advancement of Treatment**  
Sydney Welch, Magnetic Resonance Imaging, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Epilepsy is a condition that has afflicted humans throughout history. It is a condition which has been recorded for centuries, yet it is still not completely understood. Historically, it has been given many names and has had many interpretations from divine punishment, demonic possession to witchcraft. Only in recent decades has epilepsy been accepted as a biological disorder. The imbalance of neurotransmitters is the principal cause of epilepsy, but the reason for this imbalance has not been discovered despite many theories. Nonetheless, scientists continue to perfect current epilepsy treatments while also introducing new and innovative therapies. While progress continues in the treatment of epilepsy, it is crucial that stigma associated with the disorder, which can be as crippling to an epileptic’s quality of life as the condition itself, be put to an end.

**ABSTRACT #41**

**Blood on the Brain: Stroke Imaging with MRI**  
Michael Wieseler, Magnetic Resonance Imaging, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Strokes are a relatively common occurrence and are the third leading cause of death in the United States. The three types of strokes are ischemic, hemorrhagic, and trans-ischemic attacks (TIA). Ischemic strokes are caused by a complete occlusion of blood to a portion of the brain, whereas, TIAs are only a partial occlusion. Hemorrhagic strokes commonly are caused by aneurysm rupture. There are a number of risk factors that can contribute to a person’s risk of stroke. Magnetic resonance imaging (MRI) plays a crucial role in the diagnosis of a stroke and determination of treatment. The primary concerns when it comes to diagnostic imaging of a stroke are the
location, size, and time of onset. There are several MRI imaging techniques used to answer these questions which give the physician detailed information to assist in determining the treatment of the stroke. There are also new MRI techniques that may eventually play a role in salvaging tissue that has not been irreversibly damaged from a stroke.

**ABSTRACT #42**

Functional Electrical Stimulation Improves Upper Extremity Function in Hemiparetic Patients Post-Cerebral Vascular Accident

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One of the most common findings among people after cerebral vascular accident (CVA) is hemiparesis. Hemiparesis results in altered upper extremity function that can influence participation in activities of daily living and interfere with quality of life after a stroke. Currently, there are many different strategies used by physical therapists for rehabilitating upper extremity function. Functional electrical stimulation (FES) is one intervention used by physical therapist to regain functionality of the upper extremity. FES involves electrically stimulating target muscles through the use of electrodes placed on the skin attached to an external electrical source. By doing so, physical therapists can facilitate movement in paretic limbs related to functional activities. There have been concerns about the effectiveness of FES in stroke rehabilitation due to weak evidence and an unknown mechanism of action. This critical review appraised research studies pertaining to the efficacy and effectiveness of FES.

Three research articles were critically reviewed for reliability, internal/external validity, results, and applicability as it relates to the subject of the ability of FES to improve upper extremity function in post-CVA hemiparetic patients compared to conventional physical therapy.

The studies included in this critical review support the use of FES in conjunction with conventional physical therapy practice compared to conventional therapy alone in improving upper extremity function. The overall effects of FES therapy range from mild to moderate. The combined results of these studies include improved hand function, enhanced neural plasticity, faster neural conjunction, newly found muscular responses, moderate improvements in motor control, and activities of daily living. However, the exact physiological mechanism of FES remains unknown. In conclusion, the use of FES as an additional intervention with conventional therapy provides a small significant improvement in upper extremity rehabilitation. Physical therapists that are well trained in FES therapy may include this in their repertoire to enhance upper extremity function during rehabilitation in patients after stroke.

**ABSTRACT #43**

Constraint-Induced Movement Therapy is an Appropriate Treatment Approach in the Rehabilitation of Subacute Stroke Patients

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It is recorded that approximately 70-88% of patients will suffer from some degree of motor impairment following an ischemic stroke, or a stroke that is caused by interruption of blood supply to the brain. Many times, spontaneous recovery of upper limb use may result in function that is less than the total potential use. Several failed attempts using the paretic limb can lead to negative enforcement, resulting in limited use of the affected extremity with daily activities. Constraint-Induced Movement Therapy (CIMT) emphasizes massed practice with the involved upper extremity while the uninvolved arm is restrained.

Three research articles were reviewed from current available studies and were analyzed for reliability, validity, and applicability to current clinical practice. All three articles assessed upper extremity motor function using the Motor Activity Log and Wolf Motor Function Test.

The use of CIMT in clinical practice is limited because it requires a vigorous rehabilitation protocol consisting of 6 hours of physical therapy intervention a day, as well as wearing the restraint mitt for 90% of waking hours for 2 weeks. The articles included in this review studied the traditional CIMT approach, as well as a home-based CIMT protocol that may
have the potential to be more feasible for patients. Consistent results were gathered from these three articles. Significant findings of increased upper extremity use were observed immediately following the intervention period, favoring the use of CIMT. However, significant differences between CIMT intervention and traditional stroke rehabilitation were not maintained at long-term follow-up time frames, as both groups showed near equal improvement.

**ABSTRACT #44**

**Effectiveness of constraint induced movement therapy as compared to bimanual training on upper extremity function in pediatric populations**

Danielle N. Nelson, Keriann Shaw, Taylor Johnson, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Pediatric hemiplegia is often a result of cerebral palsy or brain trauma that leads to decreased motor capabilities on one side of the body, especially the arm and hand. Constraint induced movement therapy (CIMT) and bimanual training (BMT) are rehabilitation strategies that utilize intensive protocols to deliver upper extremity interventions. CIMT involves constraining the unaffected upper limb thus requiring the affected limb to practice functional activities. Conversely, BMT promotes instruction and practice in using both hands simultaneously during daily tasks. The purpose of this critical review was to compare the effectiveness of CIMT and BMT on improving upper extremity function in children with hemiplegia.

A literature review was conducted and three articles were examined that directly compared CIMT and BMT upper extremity treatment protocols. More specifically, they were randomized controlled trials from peer-reviewed journals within the last 10 years with well-defined methods and adequate sample sizes.

Both protocols require substantial time (60+ total hours) with 1:1 or 2:1 child to therapist ratio with the only difference being the constraint of the unaffected upper extremity with CIMT protocol. Interventions were performed in an intensive day camp setting for 10-15 days or at an outpatient rehabilitation center with a concurrent home exercise program three hours a day for ten weeks. Two studies concluded that CIMT and BMT led to similar short and long term improvements of both unimanual and bimanual upper extremity outcome measures including the Assisting Hand Assessment and Quality of Upper Extremity Skills Test. One study concluded that CIMT had significantly superior results in unimanual capacity using the Melbourne Assessment of Unilateral Upper Limb Function and only BMT led to retention of bimanual gains long term. Overall the results demonstrate that either CIMT or BMT can be utilized to enhance treatment, but CIMT may lead to greater advances in unimanual function of the affected limb. Additionally, BMT may lead to better retention and greater applicability to daily activities. From this critical review, it was determined that CIMT and BMT both resulted in significant improvements in overall upper extremity function in children with hemiplegia.

**ABSTRACT #45**

**Is Rehabilitation with a Dual-Task Component More Successful Than a Single Task Exercise In Improving Mental and Physical Functions In Individuals with Cognitive Impairments?**

Taylor Walker, Taylor Walgren, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Exercise positively affects physical functions like endurance, balance, strength, and power; but also on cognitive tasks like attention, executive function, and processing speeds. However, limited studies have combined a physical exercise program with a cognitive task to simulate a multicomponent dual-task training program. By including cognitive processing skills with physical exercise, rehabilitation can directly mimic real life situations that patients encounter daily. But of the studies that have looked at a dual-task training programs, most were applied to relatively healthy individuals without cognitive impairment. Therefore, this paper reviewed studies that utilized a multicomponent dual-task intervention in patients with cognitive impairments.

Three research articles were reviewed from the most current available studies. The articles were critiqued for inclusion/exclusion...
criteria, reproducibility, reliability, validity, and feasibility. One article recruited relatively healthy older adults, which served as a comparison to see if a dual-task training program is feasible. The other two articles recruited individuals with cognitive impairments to address if such a program could reproduce similar significant results in mental and physical function.

Clinicians should utilize a multicomponent training program to improve overall life skills because dual task exercise significantly increased both physical and mental functions in individuals with cognitive deficits. Dual task training increased scores in global cognition tests like the Montreal Cognitive Evaluation, the Frontal Assessment Battery, and the Clock Drawing test. Likewise, physical outcomes like balance, endurance, lower limb strength, and gait variability improved significantly after individuals were tested under a dual task setting. Thus, in rehabilitation, training physical function should be paired with cognitive training to promote real-life functioning in an individual’s environment.

ABSTRACT #47
Diagnosing Traumatic Brain Injury
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As traumatic brain injury (TBI) incidences have continued to rise over the past decade, there is an increasing recognition of the dangers of misdiagnosed or undiagnosed cases within the medical community. Substantial experimental effort has been made to define standardized diagnostic criteria for TBI and improve diagnostic accuracy, but the results are complicated and currently require more inquiry. Professionals now have a better understanding of the neurological and cognitive deficits that may result from TBIs, and as a result, modern research has turned its focus to identifying the most accurate methods of diagnosis in order to present these detailed and complex pathologic abnormalities. This exhibit serves to give a general understanding of TBI, briefly conclude the advantages and limitations of the individual modalities and clinical techniques used to aid in the diagnosis of TBI-related symptoms, and highlights the need for alternative methods of diagnosis beyond neuroimaging to improve detection accuracy and possibly aid in clinical management, such as the use of objective biochemical markers that are released in the brain post-injury to represent underlying pathophysiological processes. Further research and continuous future observation of these critical studies are needed in order to improve accuracy of patient outcomes.
ONCOLOGY

ABSTRACT #48

One-year retrospective correlation of the Pap test, high risk HPV test and biopsy at the University of California Davis Medical Center

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Introduction: The Pap test is a well-established, safe, and cost effective screening method to detect abnormal cervical cells. It has been proven that 99% of cervical cancers are linked to infection by the Human papilloma virus (HPV). Therefore, molecular testing for the detection of high risk HPV was implemented to assist in cervical cancer screening. This test is able to detect HPV infections before cytologic abnormalities occur. The purpose of this study was to determine the effectiveness of HPV molecular co-testing when performed with the Pap test on negative Pap cases.

Methods: This is a one year (2015) retrospective study in which Pap negative cases with accompanying high risk HPV testing were identified at the University of California, Davis Medical Center. If a positive high risk molecular HPV test result was seen in a Pap negative case, cervical tissue biopsy results were retrieved. All follow up biopsy results were compared with initial Pap diagnoses. Any discrepant cases were evaluated to determine the cause of the discrepancy.

Results: A total of 8,897 negative Pap test cases with a concurrent high risk HPV molecular test were identified. HPV molecular results for the Pap negative, HPV positive patients were negative in 8,157 of these cases and positive in 740 cases. The corresponding tissue biopsies for the 740 Pap negative, HPV positive cases were negative in 185 cases, positive in 34 (17 low grade squamous intraepithelial lesions, 12 high grade squamous intraepithelial lesions, and 5 adenocarcinoma cases) with no follow up in the remaining 521 cases. The Pap test of these 34 cases were re-evaluated which revealed that 25 were within normal limits, 3 were ASCUS, 2 were ASC-H, 1 case was AGUS, and 3 were unsatisfactory for evaluation. The atypical cells that were found were few in number or exhibited cellular degeneration.

Conclusion: This retrospective study demonstrates the importance of incorporating molecular HPV co-testing with the cytological Pap test to better serve the gynecologic screening needs of patients. In this study, sampling error, paucity of diagnostic cells and cellular degeneration contributed to the false negative Pap results.

ABSTRACT #49

Prostate Cancer and the Use of Multiparametric Magnetic Resonance Imaging

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Prostate cancer is the second most commonly diagnosed malignancy in males. Although the cause of prostate cancer is unknown, there are many risk factors associated with it. Ethnicity, hereditary, and age are significant risk factors that could increase the chance of developing prostate cancer. Prostate cancer is usually asymptomatic until later in the course when the cancer has spread. With the use of prostate specific antigen testing, digital rectal examinations and prostate biopsies the diagnosis can be acquired effectively. Multiparametric magnetic resonance imaging is continuing to evolve and plays a crucial role in helping diagnosis, stage and track the progression of the cancer. If the cancer is caught early enough treatment is favorable. There are many treatment options including radiation therapy, prostatectomy, and hormonal therapy. Depending on the extent and stage of the cancer, the prognosis is good as long as action is taken immediately.
ABSTRACT #50

Tumor Ablation by Diagnostic Image Guidance
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The gold standard of cancer treatment is always surgery, but occasionally patient health or the location of the tumor makes resection perilous. In these cases, laparoscopic tumor ablation is an option. If one is a candidate for tumor ablation several different ablation variants exist including the most popular type, radiofrequency (RF) ablation. In RF ablation, alternating electric currents heat up the cancerous tissue causing cell death. Other new, promising forms of ablation include: targeted gold nanoparticle ablation and irreversible electroporation.

ABSTRACT #51

Osteosarcoma: Risk Factors, Symptoms, Diagnosis and Treatment
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The purpose of this exhibit is to review the current and relevant literature pertaining to the origin, risk factors, clinical manifestations, diagnosis and imaging, and treatment of osteosarcoma in order to educate both imaging professionals and physicians on the pertinent information of this disease. A large number of peer-reviewed articles along with textbooks and websites were used for this literature review. The analysis of the materials provided important facts about the traits of osteosarcoma both clinically and via medical imaging. There are variable treatment pathways available for patients once diagnosed with osteosarcoma including but not limited to surgery, chemotherapy and radiation therapy. Having the knowledge of the risk factors, clinical presentations, imaging and treatments for osteosarcoma is important for imaging professionals since it is the most common type of bone cancer. It is highly likely working in any of the imaging modalities that imaging professionals will encounter osteosarcoma at some point in their career.

ABSTRACT #52

Determining Effective Treatments of Ependymomas
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Ependymomas, although found in both adults and children, occur primarily in pediatric patients. The diagnosis of intracranial and spinal cord ependymoma relies primarily on Magnetic Resonance Imaging (MRI). Different types of scans are often used such as perfusion MRI scans as well as T1- and T2-weighted scans. The different variances can all be seen within MRIs and later are graded depending on size and severity. Multiple treatments are available for management of ependymomas, although surgery and radiotherapy are most commonly used. Often times, chemotherapy is only used for those patients under 3 years of age. Treatment has harsh side effects that can diminish quality of life, which is why it is essential to find the best-fit treatment for each patient.

ABSTRACT #53

Imaging and Treatment of Uveal (Intraocular) Melanoma
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This exhibit was constructed to inform imaging professionals of the importance of their role in diagnosing and treating intraocular (uveal) melanoma. The exhibit goes over the origin, diagnosis, and treatment of intraocular tumors that emerge from the iris, ciliary body, or choroid. Each site of origin has a different course of imaging, which leads to its treatment plan. In order to generate accurate
measurements that help with the design of the treatment (beam size, amount of radiation, etc.), the images acquired need to be precise. Overall, this exhibit informs imaging professionals on how crucial their role and images are in the diagnosis and treatment of intraocular melanoma.

**ABSTRACT #54**

**Radiologic Imaging & Presentations of Phyllodes Tumor**

Rachel Wang, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Cytosarcoma phyllodes, is a breast neoplasm that accounts for less than one percent of all breast tumors. It appears as a unilateral, well-defined and large mass with a characteristic leaf-like cellular appearance. Radiographic findings of phyllodes tumors are often misinterpreted as a fibroadenoma and distinguishing between them is essential if there is risk for malignancy. Mammography and ultrasound are the primary modalities to assist in diagnosis, but computed tomography (CT) and magnetic resonance imaging (MRI) can provide important information as well. However, these modalities are less effective in distinguishing fibroadenomas from phyllodes tumors. Malignancy is often determined though a surgical excision of the entire neoplasm. The World Health Organization (WHO) provides two methods of grading. The main three-tiered system is utilized at most health institutions, including three categories: benign, borderline, and malignant. Placement into these three categories are based on criteria such as stromal overgrowth, size, marginal appearance, mitoses per high-power field (HPF) and atypia.

**ABSTRACT #55**

**Proton Therapy: An Advanced Alternative to Radiation Treatments**

Ellie Brouillette, Emily Johnson, Radiation Therapy program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Photon-generated radiation therapy has long been used in the treatment of various malignancies, but more recently, the advancement of radiation therapy (RT) using protons has become another viable treatment option. Proton radiotherapy offers the possibility of better precision of the radiation dose to the target tumor volume, a decreased dose to surrounding normal tissues, and a reduction in toxicities to the body after treatment. Proton radiotherapy uses positively charged protons that have the capability to more accurately conform to the actual size and depth of the tumor. Although the initial costs of proton therapy are higher, studies have shown that proton RT to certain types of malignancies resulted in fewer radiation-induced medical issues. The increased precision and decreased toxicities make proton RT a potentially better method for radiotherapy treatment; however, continued research is necessary before proton RT can become the new standard.

**ABSTRACT #56**

**Treating Brain Metastasis of 5 or Fewer Lesions, a Comparison**

Jacqueline Monzingo, Emily Smith, Katie Thaman, Radiation Therapy program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Brain metastasis occurs in 10-30% of adult and 6-10% of children with cancer, and makes up more than one-half of brain tumors. Diagnosis of brain metastasis is a poor prognostic indicator and generally prognoses a one – three month survival time. With the high prevalence and incidence of brain metastasis, research is crucial in determining the best treatment. Historically brain metastasis has been treated with whole brain radiation therapy.
(WBRT). However, recent research indicates prevalence for stereotactic radiosurgery (SRS) as the preferred treatment for brain metastasis of 1-5 lesions. The purpose of this literature review is to compare and contrast the use of WBRT and SRS, either alone or in combination, in the treatment of brain metastasis of 1-5 lesions.

ABSTRACT #57
Conventional Therapy vs. Immunotherapy in Prostate Cancer
Michael Wieseler, Cole Stoltenberg, Radiation Therapy program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Classified as the most common malignancy of the male population, prostate cancer is a disease of the aging. It is the second most fatal among the male population behind lung cancer. As the incidence of this diagnosis remains steady, new methods of treatment are being examined and compared. Currently, surgery and radiation are the treatments of choice most commonly. Although a moderately successful cure rate, there are several side effects associated with this treatment approach. Many patients successfully undergo debulking or prostatectomy, but invasive surgery leaves a patient prone to infection and other complications. Although there have been several advancements in radiation therapy treatments such as arc therapy, intensity modulated radiation therapy and proton therapy, there are still several issues associated with the process. High toxicity of peripheral organs, specifically the bladder and rectum, may react negatively to the high doses being received. These issues may lead to negative lifestyle changes or an increased chance of developing a secondary malignancy for those receiving treatment. Scientists have discovered a new method to combat prostate cancer which relies on the enhancing an individual’s immune system as the mainline defense. A multitude of immunotherapy agents can be administered to individuals to help boost the response of the immune system in prostate cancer and other malignancies. This defense mechanism avoids the administration of cytotoxic agents, therefore minimal side effects will be observed. Side effects of immunotherapy treatments are generally less severe in nature compared to those observed in those who receive chemotherapy and external beam radiation treatments. However, current studies show that immunotherapy as a primary treatment may only be helpful to very early stage disease and cannot be administered within three months of the patient receiving any chemotherapy treatment. Nonetheless, it has been shown that immunotherapy has been proven more effective when used concurrently with conventional therapies. Application of immunotherapy increases overall survival up to 30% in late stage disease, and close to 100% for early disease presentations. This new therapy strategy has its advantages and disadvantages, both patients and physicians alike must weigh the benefits and risks before implementing this treatment.

PREVENTION AND WELLNESS
ABSTRACT #58
Availability of Resources: How Job Roles in Ambulatory Care Impact Burnout and Work Pressure Perceptions
John Crowe, Victoria Kennel, Katherine J. Jones, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

We sought to use the Medical Office Survey on Patient Safety Culture and (burnout tool name) to determine how job role—physician vs. licensed and unlicensed support staff—is associated with perceptions of burnout and work pressure and pace in ambulatory care. The costs of hiring and retraining medical providers and staff due to burnout and subsequent turnover may represent over 5% of a healthcare organizations’ annual operating budget. A better understanding of the scope of the problem of burnout in ambulatory care is needed given the pressure for primary care clinics to become patient-centered medical homes that achieve the triple aim of improved population health, enhanced patient experience, and managed costs. Therefore, we used Pearson correlation to determine the relationship between burnout and work pressure and pace and moderated multiple regression to determine variation in the association between burnout and work pressure and pace by job role using a multilevel structure
The fourteen Ambulatory Care Clinics within Nebraska Medicine voluntarily participated in the study. Our findings indicate that the greater the perceptions of burnout, the less positive were perceptions of work pressure and pace ($r = - .423$) across the sample. We then entered the mean-centered main predictors, burnout ($p < .001$) and job role ($p < .001$), into a regression analysis and found both were significantly associated with work pressure and pace while controlling for clinic assignment. In the second step, we entered the burnout x job position interaction term alongside the main predictors, and the interaction term was significantly associated with work pressure and pace ($p = .04$). The negative association between burnout and work pressure and pace was stronger for licensed and unlicensed support staff than for physicians. Consistent with the Job Demands-Resources model, our data indicates that while burnout is felt by all job roles in ambulatory care clinics, for individuals with more resources, the impact is not as dramatic. Therefore, both the healthcare system and individual clinics should seek to provide staff with the resources needed to mitigate burnout and its related negative impact on work pressure and pace.

**ABSTRACT #59**

**Examining High Risk HPV Rates in Atypical Repair ASCUS Paps**

Steven Krauklis, Jacqueline Spaniol, Cytotechnology program, College of Allied Health Professions, Carle Foundation Hospital Satellite, Urbana, IL

Introduction: The Bethesda System states that the atypical squamous cells of undetermined significance (ASCUS) diagnosis is given when there are cytologic changes suggestive of a low grade squamous intraepithelial lesion, but the changes are inadequate for a definitive interpretation, including features associated with atypical repair. Atypical repair is one such pattern that Bethesda categorizes as ASCUS. Atypical repair is defined by Bethesda as "reparative changes that manifest some degrees of cellular overlap, dyscohesion, anisonucleosis, and/or loss of nuclear polarity". Because these traits differ from stereotypical ASCUS features, atypical repair is easily downplayed. The purpose of this study is to examine the relationship between atypical repair ASCUS and HPV results to determine if ASCUS is the appropriate diagnosis for atypical repair. Ng et al. published a study in 2003 examining this relationship, however, our study will have a larger sample size, different techniques, and we will be examining this relationship in a geographically different population.

Methods: Electronic medical records and SurePath cervical cytology specimens were assessed retrospectively. The specimens used in this study were previously diagnosed as ASCUS, had original markings, and the HPV test results were available. HPV results were identified for each ASCUS case and the markings were reviewed blindly and independently by both students to determine whether the call was based on atypical repair or other ASCUS characteristics. If the two students disagreed on a case, it was then adjudicated by a staff cytologist at Carle. To be considered atypical repair, the cells were required to have apparent cohesiveness as well as two of the following: pleomorphic nuclei, cellular overlap, prominent nucleoli and/or loss of polarity.

Results/Conclusion: This study determined that out of 94 atypical repair cases, 53.2% were high risk HPV positive. In contrast, only 46.6% of the 324 other ASCUS cases were high risk HPV positive. This suggests that atypical repair may have a higher rate of high risk HPV infection than the average ASCUS, justifying the Bethesda system classification of atypical repair as ASCUS and the use of ASCUS triage on these cases.

**ABSTRACT #60**

**Laboratory Efforts to Educate Patients on Proper Glucometer Use and Maintenance**

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Medical Laboratory Science students participate at the University of Nebraska Medical Center’s student-run SHARING clinics by performing CLIA-waived point of care testing. As part of the interprofessional health care team, the MLS students also provide patient education regarding correct use and care of patient glucometers.
Patient education is a crucial part of diabetic self-management, and requires appropriate instruction and communication between providers and patients. Glucometers are an important tool for management of diabetes, and correct use is essential to obtaining accurate blood glucose results. Though glucometers have become easier to use over time, they are still technical devices that can give erroneous results if used incorrectly, which can reinforce negative patient behaviors or provide unreliable data that may lead to misinterpretation or delay in treatment.

Our goal as MLS students is to educate student providers of various professions (e.g., laboratory science, pharmacy, medicine, physician assistant) in the proper use and care of glucometers and of patient practices that may lead to invalid blood glucose results. Proper education of student providers should increase their confidence in educating patients which may lead to a more trusting relationship and better communication between the student provider and the patient while providing the patient with knowledge of practices that will invalidate their blood glucose results.

To achieve this goal, we propose using a standardized educational format so that all student providers consistently offer the same educational information to patients. A checklist will be used to document the information provided during the educational event. A pre- and post-survey will be given to determine the confidence and competency of the student provider of the proper use and care of the glucometer. We propose that incorporating a standardized educational format will improve student providers’ knowledge and confidence such that communication and trust with the patient is improved, and patients are better able to self-manage their diabetes. The purpose of this pilot project was to survey MLS students perceived confidence in providing glucometer patient education after the MLS students received glucometer training.

ABSTRACT #61

Comparison of growth in pediatric patients with Cystic Fibrosis before and after implementation of a nutrition-based follow-up protocol
Dana Pralle, Medical Nutrition Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Background: Early nutrition intervention is important in pediatric patients with Cystic Fibrosis (CF), because good nutritional status early in life is associated with improved clinical outcomes. Due to the well-documented positive correlation between growth and lung function in this population, it is recommended that pediatric patients with CF reach the 50th percentile for weight-for-length by 2 years of age.

Purpose: With the goal of improving growth in patients with CF from birth to 2 years of age, the Nebraska Regional CF Center implemented a new nutrition-based follow-up protocol in 2014. The purpose of this study was to compare growth outcomes among pediatric patients with CF before and after the implementation of the new protocol. This study also evaluated adherence to the new follow-up protocol.

Methods: This was a retrospective chart review of 45 patients with CF that were followed at the Nebraska Regional CF Center. Data were collected for three groups of patients: the pre-implementation group, the transition group, and the post-implementation group. Anthropometric and clinical data were collected at 6-month intervals from birth to 2 years of age. Statistical analysis was used to compare the groups.

Results: Although the differences were not significant, the post-implementation group had higher median weight-for-length percentiles at all visits other than the initial visit. At the 1-year visit, the median weight-for-length percentile was 37.4 in the pre-implementation group and 65.0 in the post-implementation group (p=0.15). Between the initial visit and 18-month visit, the median increases in weight-for-length percentiles were 35.75 and 53.73 in the pre-implementation and post-implementation groups respectively (p=0.34). Overall adherence to the new follow-up protocol was 51.2%.

Conclusion: Patients in the post-implementation group trended toward having higher weight-for-length percentiles, especially in the first 18 months of life. The new nutrition-based follow-up
protocol may have a clinically significant impact on the growth of these pediatric patients.

**ABSTRACT #62**

Calcium and Vitamin D Intake in Type 1 Diabetics and Impact on Bone Health
Laura Triplett, Laura Armas, Corri Hanson, Medical Nutrition Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Objective: To compare intake of calcium and vitamin D between healthy Type 1 Diabetics (T1DM) and control subjects and identify associations with bone health.

Background: T1DM individuals have been shown to have an increased fracture risk of with an estimated 6.9 times greater risk as compared to non-diabetics. Proposed mechanisms have focused on the underlying physiology of the disease. Dietary patterns of T1DM adults have not been studied much up to this point, with most of the literature focusing on insulin to carbohydrate dosing strategies.

Methods: This was a cross-sectional study of 108 male and female subjects (median 37 yrs), 41 T1DM and 67 controls. A self-administered ‘Block Calcium and Vitamin D Screener’ was used. Bone mineral density (BMD) and bone mineral content (BMC) measures were obtained using dual energy absorptiometry (DXA) scan (Hologic) along with Z-score. Mann-Whitney U tests were used to compare calcium and vitamin D intake between groups. Correlations between intake and DXA were analyzed using Spearman’s rho.

Results: Relative frequency of intake for dairy was greater in control subjects, though not significant (P=0.06). Difference in food group intake was found only for ice cream (P=0.03). Total calcium was not different between the two groups (P=0.12), but supplemental calcium intake was higher in the control group (P=0.03). Overall calcium intake was below the RDA of 1000 mg/d in both groups with a median of 550 mg/day for all subjects and 80.6% falling below the RDA. Dietary calcium intake was positively associated with femoral neck (FN) BMD in T1DM subjects (P=0.02). A positive correlation was found between diet vitamin D and whole body BMC (P=0.01), hip BMC (P=0.04), FN BMC (P=0.03) and FN BMD (P=0.01) for all subjects.

Conclusion: Calcium intake was not different between healthy T1DM and control subjects, with both groups not meeting the RDA for calcium. Dietary Ca was associated with femoral neck BMD in T1DM subjects. Dietary vitamin D was associated with BMC and BMD at various sites for all subjects.

**ABSTRACT #63**

Restrained In Close Quarters: An Analysis of the Growing Dependency of Anesthesia Usage in MRI and the Potential for Alternatives
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In magnetic resonance imaging (MRI) it is routine to encounter patients with multiple factors involved in their specific care. One common consideration for their care is overcoming emotional and psychological stressors inherent within MRI. In such cases, administration of sedative agents or anesthesia is currently used as a primary method of restraint. The overuse of anesthetics as means of intervention to control or restrain patient motion within magnetic resonance has grown exponentially through recent years. This trend of chemical restraint leads to increased accounts of adverse events with patients. In an effort to abridge those events, healthy and accommodating alternatives should be considered prior to administration of anesthesia.

**ABSTRACT #64**

Yoga and the Effect as Treatment for Chronic Low Back Pain
Laura Freese, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Chronic low back pain affects approximately 100 million adults in the United States with annual costs valuing $635 billion. Though many undergo surgical interventions in addition to lifestyle modification, there is continuation of chronic symptoms, which can be due to both biological and behavioral causes.
Yoga is a form of alternative or complementary medicine. It has been thought to show a positive effect on the outcome of lower back pain in place of usual care. It utilizes a range of methods including physical exercise, breathing techniques, meditation and relaxation practices to enhance health and well-being. The mechanism for the reduction of lower back pain is still in question. Hypotheses consists of an increase in tissue flexibility and oxidation combined with relaxation effect within the lower back and release of enkefalins or endorphins. The American Pain Society’s guidelines recommend that clinicians consider offering yoga to patients with chronic low back pain. Strength of Recommendation: B

ABSTRACT #65

What role can innovative communication strategies play in overcoming practical barriers to vaccination and improving routine childhood immunization rates?
Samantha Kaftan, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

In consideration of national healthcare goals to improve routine childhood immunization rates and avoid vaccine-preventable deaths, this discussion will examine the use of recall and reminder systems at both a provider and population level in their ability to effectively increase vaccination rates. As substantiated by two systematic reviews, provider-initiated interventions were shown to significantly increase immunization rates among children in the United States regardless of mode of communication (phone, postal, etc.). However, the lack of provider participation in such recall and reminder systems despite recommendation necessitates further discussion of alternative or novel strategies to expand reach and cost-effectiveness. As exhibited by a population-based cluster randomized trial performed in Colorado, transferring the task of immunization communication to population based immunization information systems (IIS) shows promise in both increasing widespread influence and decreasing the cost per child as compared to traditional provider-based methods. Lastly, the potential use of relevant technology to both modernize proven reminder and recall interventions as well as to provide families, providers, and IIS a common platform in order to enhance vaccination communication and further improve vaccination rates is evaluated. Strength of Recommendation for use of recall and reminder interventions: A

ABSTRACT #66

Fecal microbiota transplantation for the treatment of recurrent Clostridium difficile infection: a Critical Review
Heidi Lindstad, Wayne Mathews, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Fecal microbiota transplantation from a healthy donor to an affected patient can effectively and safely be used to treat recurrent Clostridium difficile infection (1, 2, 6, 8). There have been no adverse events reported from fecal microbiota transplantation (1, 6). Minor side effects including diarrhea and abdominal cramping have been reported, but usually don’t last longer than a few hours (1, 6). One study identified age over 65 years as a risk factor for less successful fecal microbiota treatment and higher recurrence rates (6). Fecal microbiota transplantation has been compared with vancomycin antibiotic treatment in two small randomized clinical trials for the treatment of recurrent Clostridium difficile infection (2, 8). These studies have shown that fecal microbiota transplantation is superior to vancomycin treatment with respect to resolution rates of Clostridium difficile infection (2, 8). Various delivery methods have been studied, primarily looking at the difference between upper gastrointestinal delivery with a nasogastric or nasoduodenal tube and lower gastrointestinal delivery with colonoscopy. Initial reviews show that lower gastrointestinal delivery methods lead to higher resolution rates and lower recurrence rates (4, 6). As Clostridium difficile infections become more resistant to standard antibiotic treatment, FMT is an important and potentially life-saving intervention for patients with recurrent infection (1, 6). Strength of Recommendation: B
A Comparison of the Effectiveness of Keloid Treatment in Adults and Children using Cryotherapy and Intralesional Corticosteroids
Trisha Quon, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Keloids are overgrown scar formations caused by abnormal healing response to epithelial surface lesions. They can be caused by a number of things including but not limited to blunt trauma, bites, injections, tattoos, and more commonly acne in regions of the body with high-tension skin areas like the shoulders and chest. Though keloids are primarily a cosmetic concern to patients, they can be troublesome due to pruritis, irritation, and recurrence. The etiology is not fully understood, but there are many theories; some of which are an increase in growth factor and cytokines, abnormal fibroblast activity, metabolic fatty acid deficiency, and abnormal immune reactions. Due to the ambiguous pathophysiology, there are several treatment options, but no method is consistently preferred for complete scar eradication. The purpose of this study is to use published systematic reviews and randomized controlled trials to compare the effectiveness of two frequently used keloid treatment methods, intralesional corticosteroids and cryotherapy, and provide a treatment recommendation regarding the two methods.

Upon review of 5 studies, the targeted population was divided into adults and children. In adults, there was one study showing cryotherapy to have no beneficial effect on keloid reduction. There were several studies contradicting this source, showing there has been a significant reduction in keloid volume and appearance using cryotherapy alone, however combination therapy with other methods was most effective. In children, one study shows evidence of significant keloid volume reduction using intralesional corticosteroids. Very few studies have been done on keloid treatment in children, so the current recommendation for the pediatric population is corticosteroids. Future studies to better a recommendation for monotherapy in both the adult and pediatric population are recommended.

Effect of a plant-based diet on the prevention and management of type-2 diabetes mellitus
Jessica Wright, Physician Assistant Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Research, especially in the last decade, has consistently supported the premise that type-2 DM is largely preventable, and the biggest culprit is patients’ diet. Dr. Philip Tuso, head of the National Physician Lead for the Care Management Institute’s Total Health Program, states that the best way to achieve healthy eating and prevent heart disease is with a plant-based (vegan) diet, which “encourages whole, plant-based foods and discourages meats, dairy products, and eggs as well as all refined and processed foods” [6]. Plant-based diets have been widely supported in research literature. The Adventist Health System published one of the largest longitudinal studies studying the effect of vegetarian dietary patterns and mortality in America and found that plant-based diets were associated with a 50% reduction in risk of type-2 diabetes when compared with the risk that presented with non-vegetarian diets. When the diet was maintained for many years researchers found a 74% reduced risk of type-2 diabetes development when compared to diets that consisted of at least once weekly meat intake. Individuals who adhere to a plant-based diet have also been shown to have lower BMIs and results from the European Prospective Investigation showed that BMI increases when a wider spectrum of animal products are eaten based. Plant-based diets have also been shown to improve glycemic responses and dyslipidemia, lower HbA(1c) better than the diet suggested by the American Diabetes Association, improve insulin sensitivity, are more satiating, and result in greater net weight loss when directly compared to non-vegetarian diets. Strength of Recommendation = A.
ABSTRACT #69

Autism in Children and the Use of Prenatal Ultrasounds: Is There a Correlation?
Elizabeth Gubbels, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Autism spectrum disorder is a neurodevelopmental disorder that affects many people worldwide and continues to be an issue. People with this disorder have difficulties with communication skills as well as learning and behavior processes. A large increase in the prevalence of this disorder has been seen in the United States as well as other countries in the past four decades. This increase in autism diagnoses is paralleled by an increase in prenatal ultrasound use. Although the exact cause of autism is not known, many have speculated that ultrasounds could be a factor that leads to a diagnosis. The purpose of this poster is to take a closer look at the rapid increase in autism cases throughout the last few decades and to determine if ultrasound use during pregnancy is the cause behind it.

PROFESSIONAL PRACTICE

ABSTRACT #70

Survey of Antimicrobial Prescribing Practices and Interpretation of Rapid Blood Culture Identification Results
Linsey M. Donner,1 W. Scott Campbell,2 Elizabeth Lyden,3 Paul D. Fey,2 Trevor C. Van Schooneveld,4 1- Medical Laboratory Science program, College of Allied Health Professions, 2- Department of Pathology and Microbiology, College of Medicine, 3- College of Public Health, 4- Department of Internal Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE

Background: Microbiology reporting can be difficult to understand and new rapid pathogen identification technology has made it more challenging. Nebraska Medicine recently implemented the Biofire FilmArray Blood Culture Identification Panel (BCID) with stewardship-based education on test result interpretation. Provider BCID result interpretation and prescribing decisions were assessed via survey. Methods: An email survey was distributed to 382 physicians. Questions addressed physician characteristics, antibiotic prescribing practices, and interpretation of BCID results. Seven questions required respondents to interpret BCID results and make clinical decisions. Tallied correct responses resulted in a knowledge score. Descriptive statistics summarized survey responses. General linear models evaluated the effect of role and specialty on the mean knowledge score and correct responses to specific scenarios. Kappa statistics were used to evaluate the agreement between use of antimicrobial stewardship resources and correct responses to knowledge-based questions. Results: The response rate was 40.8% with a distribution of specialties of 57% internal medicine, 20% family medicine, and 25% other. Role included 41% residents, 5% fellows, and 53% faculty. Of those surveyed, 89.4% reported reviewing antimicrobial susceptibility results with 81.6% adjusting therapy based on this review while only 60% reported adjusting therapy based on BCID results. Correct response rates for interpretation questions ranged from 52 - 86%. Common errors included misinterpretation of Enterobacteriaceae and Staphylococcus genus results. After adjusting for role, the mean total knowledge score did not differ among specialties (p=0.13). After adjusting for specialty, the score did not differ among role (p=0.47). There was low agreement between correctly answering the knowledge questions and having reviewed antimicrobial resources on the BCID (all Kappa statistics <0.2).

Conclusions: Misinterpretation of BCID results is relatively common and may result in ineffective treatment or missing the opportunity to narrow therapy. Improved reporting practices of BCID results with clinical decision support tools providing interpretation guidance available at the point of care may improve the clinical impact of this technology.
ABSTRACT #71

Association Between Safe Transfer/Mobility Techniques and Fall-Related Injury in the Acute Care Setting
Katherine J. Jones,1 Dawn Venema,1 Anne Skinner,1 Kristen Topliff,1 Robin High,2 1-Physical Therapy Education, College of Allied Health Professions, 2- College of Public Health, University of Nebraska Medical Center, Omaha, NE

Background: Approximately one million falls occur in U.S. hospitals annually. The one-fourth that result in injury are hospital-acquired-conditions for which the Centers for Medicare and Medicaid Services no longer provide reimbursement.

Research question: What is the association between common fall risk reduction interventions and inpatient fall-related injury?

Significance/relevance: Little is known about the association between safe transfer/mobility techniques and fall-related injury in the acute care setting.

Methods: We collected patient and system information from 352 fall events in 17 small rural hospitals in a Midwestern state during a two-year fall risk reduction collaborative. As part of the collaborative, each hospital implemented an interprofessional fall risk reduction team including nurses, pharmacists, and rehabilitation (physical and/or occupational) therapists. We calculated odds ratios (ORs) to determine associations between fall risk reduction interventions and injury.

Findings: Of nine common fall risk reduction interventions, use of alarms (OR=0.63, 95% CI 0.40 – 1.00) and a toileting schedule (OR=0.55, 95% CI 0.31– 1.00) appeared to decrease the risk of injury. The intervention associated with the least risk of injury was providing hands on assist during the fall using a gait belt (OR=0.22, 95% CI 0.09 – 0.58).

Conclusions: By training direct patient care staff in safe transfer/mobility techniques and conducting audits to ensure reliable implementation of the training, rehabilitation therapists may decrease the likelihood of patient injury associated with falls. To achieve this goal, rehabilitation therapists should expand their role in the acute care setting from individual patient management to population management as members of interprofessional fall risk reduction teams.

ABSTRACT #72

“Just” Culture? The Impact of Just Culture Adoption on Patient Safety Culture
Victoria Kennel, Katherine Jones, Anne Skinner, Michael Yoerger, Physical Therapy Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

The Joint Commission’s most recent sentinel event alert indicated leadership must prioritize the development of a culture of safety. A ‘just’ culture – where people are encouraged and rewarded for reporting and providing essential safety-related information, but clear lines are drawn between human error and at-risk or reckless behaviors—is a foundational element of a culture of safety. In partnership with the Nebraska Coalition for Patient Safety (NCPS) we designed and supported the first Nebraska Just Culture Collaborative to improve safety culture in hospitals through the implementation of just culture principles and tools.

Methods: 11 hospitals participated in the Just Culture Collaborative from June 2015-December 2016. Outcome EngenuityTM conducted a 3-day workshop where 33 professionals from the 11 hospitals became Just Culture Certified Champions. These champions planned and implemented just culture in their facilities. UNMC and NCPS supported collaborative members’ implementation efforts through 18 monthly collaborative conference calls, tracked each facility’s implementation progress, and reviewed behaviors that contributed to reported adverse events and associated organizational responses. UNMC conducted the Hospital Survey on Patient Safety Culture pre- and post-collaborative to evaluate the impact of just culture adoption on safety culture.

Results and Conclusions: Six hospitals planned and fully implemented just culture training for leaders, managers, and staff. In these facilities, the frequency with which actions consistent with a just culture were observed by employees in practice—the transfer of just culture training into practice—were key to improving perceptions of safety culture, particularly in communication openness, feedback and communication about error, non-punitive response to error, organizational learning and continuous improvement, and the frequency of events reported. There was little change in safety culture among facilities that did
not start or fully implement just culture training and education. Human errors accounted for two-thirds of behaviors identified from the 60 events reported to NCPS during the collaborative. Organizations must make efforts to respond to employees who experience human errors in a fair and just manner – improving system design to mitigate human error is a significant issue in need of attention and resources.

**ABSTRACT #73**

*Evaluation of Lung Ultrasound in the Diagnosis of Pneumonia in Pediatrics*
Marissa Kaluza, Katie Madsen, Jerilyn Houser, Diagnostic Medical Sonography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Pneumonia is the single largest pulmonary infectious cause of death in children worldwide. Alternative diagnostic methods that do not involve the use of ionizing radiation should be considered when evaluating young individuals with pneumonia to minimize cancer risk. Ultrasound has received increasing attention in recent years as a tool to evaluate the lungs given its lack of ionizing radiation and ease of use. The findings of these studies are that lung ultrasound could serve as a sensitive and highly specific diagnostic method instead of chest radiography in children suspected of pneumonia. This exhibit demonstrates the steps in performing the lung ultrasound exam, the sonographic appearance of pneumonia, comparisons in the diagnosis between ultrasound and chest radiography, and how lung ultrasound is more reliable than using ionizing radiation in the diagnosis of pneumonia.

**ABSTRACT #74**

*Exploration of Clinical and Nutrition Related Variables and their Association with the Malnutrition Screening Tool Score*
Brenda Berns, Medical Nutrition Education, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Purpose: The purpose of this study was to examine clinical and nutritional variables in relation to the score generated from the Malnutrition Screening Tool (MST). Specifically, the study evaluated relationships between the MST score and length of stay (LOS), body mass index (BMI), and the nutrition problem documented within the Nutrition Therapists first charting note.

Methods: This was a retrospective chart review of 313 subjects who populated a consult list based on their responses to the MST instrument. Data pertaining to demographic information, BMI, the nutrition problem documented per the Nutrition Therapists, admission and discharge date, and the MST score were collected. The MST score was acknowledged as both a continuous and categorical variable, thus both types of statistical analysis were used to determine relationships between LOS and BMI, but not the nutrition problem. The previously mentioned variable was tested solely against the MST score as a continuous variable.

Results: Of the 313 subjects, 10.2% were classified as malnourished based on the Nutrition Therapist’s nutrition diagnosis. Mean age was 57.3 years, mean LOS was 7.14±8.9 days, and mean BMI was 26.0±7.0. Results indicated no significant difference between LOS and MST score as a categorical variable, however, the Spearman correlation did indicate a barely detectable statistically significant difference (r= -0.106, p=0.065). No significant relationship was found between BMI and MST score indicated as a categorical or continuous variable, (p=0.177, p=0.321, respectively). The Kruskal-Wallis test with post hoc analysis depicted the only significant difference between the nutrition problems to be between the intake related malnutrition variables (IRMV) group and the screened at increased nutrition risk (SAINR) group, suggesting that those who were diagnosed with a nutrition problem in the SAINR category had a higher MST score than those.
who were categorized under the IRMV group (p=0.000).

Conclusion: There was no significant relationship between the MST score with neither LOS nor BMI. However, the nutrition problem SAINR resulted in a significantly higher MST score than did the nutrition problem IRMV. There is conflicting evidence to support whether the nutrition problem may be a good predictor of the MST score.

ABSTRACT #75

MRI Safety
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Magnetic Resonance Imaging (MRI) can be a dangerous imaging modality because of implanted devices, acoustic noise, adverse reactions to contrast, and projectiles. Unfortunately, there have been several deaths, injuries, and accidents in MRI. Safety guidelines have been neglected in the past, but now there are guidelines through the American College of Radiology (ACR). The ACR gathered a Blue Ribbon Panel of MRI experts to publish guidelines pertaining to MRI safety, but there are no official rules in place. The guidelines cover MRI safe, conditional, and unsafe devices as well as the MRI safety zones. Following the guidelines aids in the reduction of injuries, accidents, and deaths. These documents are also a source of education, which is important for technologists, healthcare providers, patients, and family members. Though there has been new research and guidelines in MRI safety in regards to screening, zones, and implants, there is a need for continuing research and the education of healthcare professionals and the general public.

ABSTRACT #76

Forensic Imaging: A Deeper Look Into Advanced Radiology
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Radiologic imaging, now more than ever, is being incorporated into a variety of procedures because of the different modalities’ extensive technological attributes. One of these procedures is within forensic imaging. Forensic imaging is taking its rightful place in a world where traditional autopsy is still the go-to. Postmortem computed tomography and postmortem resonance imaging are being seriously considered as viable alternatives to this traditional method. In order to fully understand why the death of an individual took place, it’s important to discern his or her injuries. This is sometimes not feasible without extensive techniques. Postmortem imaging offers these and then some. Included in this research are various rationales as to why postmortem imaging is becoming much more widely accepted as well as its continued contribution to the field. The overall goal is to provide a much less invasive approach than a traditional autopsy. Doing imaging in this manner provides exceptional detail in cases involving trauma. There is also a greater likelihood of seeing soft tissue problems, cerebral anomalies, and cardiac and renal impairments that would have otherwise been missed. Reconstructions allow a corpse to be put back together using enhancement techniques that filter in muscle and metal the patient may have had implanted in his or her body; superior bony detail can also be seen. As this form of imaging becomes more and more accepted, the autopsies that are being performed today may be a thing of the past tomorrow. The detail and the noninvasive approach postmortem imaging takes make it a very reasonable alternative to the latter. The more it is utilized, the better the protocols can be developed, thereby enhancing every investigation even more.
**ABSTRACT #77**

The Role of Computer-Aided Detection Systems in Radiology
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The purpose of this exhibit is to inform readers about the role of computer-aided detection (CAD) systems in the field of radiology by portraying its purpose, applications, and performance in the clinical setting. CAD has shown statistical evidence that it has the potential to enhance the capabilities of the radiologist in interpreting medical images. It can also help to reduce the workload of the radiologist by speeding up the process of detection. Computer-aided detection systems have been implemented into multiple imaging modalities and offer a wide range of possibilities for the future.

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**ABSTRACT #78**

Down Syndrome Detection through Ultrasound
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Down syndrome is the most common aneuploidy found in unborn children, and it is the most prevalent cause of mental retardation. This aneuploidy occurs when an extra copy of chromosome 21 is produced or when one copy of chromosome 21 exchanges its components with another chromosome, causing the fertilized egg to possess extra chromosome 21 material. Diagnostic ultrasound provides a visual of anatomical and physiological features in unborn patients, so preparations for their care outside of the womb can begin. Ultrasound is a safe modality to use, because it uses high frequency sound waves that utilize non-ionizing radiation to produce an image. This study was performed to assess common features, called sonographic markers that are found in the ultrasound scans of babies born with Down syndrome. Nuchal translucency and a small-to-absent nasal bone are two of the most commonly found sonographic markers observed using diagnostic ultrasound in the detection of Down syndrome. This study provides more information on sonographic markers, as well as information on Down syndrome and the use of diagnostic ultrasound. Although physicians don't use ultrasound for an official diagnosis for Down syndrome, a cluster of markers throughout each trimester of a pregnancy shows a strong correlation with the baby having this aneuploidy. Even though Down syndrome produces lifelong effects, health professionals can use ultrasound to detect Down syndrome, and families can plan for the possibility of using body function services, such as speech therapy or occupational therapy.

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**ABSTRACT #79**

Theranostics and Medical Imaging
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The field of medicine is constantly evolving and making advancements so much that it is essential for anyone that works in this career field to educate themselves on the best practices as well as any up and coming advancements in the specific modality in which they work. In radiology, the concept of theranostics emerged just within the last decade. John Funkhouser wanted a way to combine both the therapeutic and the diagnostic fields together to create personalized medicine, hence the term theranostic was born. While the exploration of both the diagnostic and the therapeutic components of theranostics is important, it is equally important to know about the roles that different medical imaging modalities participate in with the help of theranostic carriers. All of these things would prove to be valuable information to any medical professional, but especially those working in the imaging and therapeutic sciences field.
Serial Transverse Enteroplasty (STEP)
Sarah Turner, Radiography program, Department of Medical Imaging and Therapeutic Sciences, College of Allied Health Professions, University of Nebraska Medical Center, Omaha, NE

Short bowel syndrome is a complex issue that can lead to life threatening complications. This syndrome has a growing number of patients. There are many treatments available, but one of the most successful treatments has been the surgical procedure called Serial Transverse Enteroplasty or STEP. This procedure involves cutting into the small intestine and making it smaller in diameter and longer in length. This may provide the patient with an adequate amount of bowel to do well. The smaller diameter also allows for peristalsis. Not every patient is a candidate for a STEP procedure. Radiology testing plays a major role in assisting a surgeon with the needed information to determine if the patient will be given this option. As with any surgical procedure, there can be complications. Radiology also plays a role in diagnosing, and at times assisting with treatment, of these complications.