School of Health Sciences
Research Conference
April 24, 2015

8:30 a.m. – 3:40 p.m.  Coffee available in Andrew E. Lee Medical Building Room 110

9:00 a.m. – 10:00 a.m. Welcome by Dr. William Schweinle, SHS Research Committee Chair
Opening Comments by Dr. Michael J. Lawler, Dean, School of Health Sciences, and Dr. Mary Nettleman, VP, Health Affairs and Dean, Sanford School of Medicine
Presentation of Faculty Awards by Dr. Moses Ikiugu, School of Health Sciences Faculty Council
Presentation to Dr. Ronald Lindahl
Dr. Stacy Smallfield, Department of Occupational Therapy, Keynote Speaker

10:10 a.m. – 11:20 a.m. Oral Presentations (See Oral Presentations Listings)
Posters Available for Viewing

11:20 a.m. – 2:00 p.m. Lunch Provided in Andrew E. Lee Medical Building Atrium
Seating available in rooms 105, 22a, 106, 108, 110
Poster Session (See Poster Session Listings)
Authors available for discussion
3D Printing Showcase in Andrew E. Lee Medical Building Room 102
Midwest 3D Solutions available for viewing, questions, and informal discussions

2:05 p.m. – 3:40 p.m. Oral Presentations (See Oral Presentations Listings)
Posters Available for Viewing
**Postural Control Management in Children With Idiopathic Toe Walking Behaviors**

**Summary:** Idiopathic toe-walking (ITW) is an atypical toe-toe gait pattern with absence of heel strike and without a specifically identified etiology. Performance scores on motor proficiency tests and parent reports suggest that children with ITW have difficulties managing balance and frequently stumble, trip, and fall. Research analyzing static postural control in children with ITW is limited. This study examined static postural control in children with ITW by measuring loading patterns under variable sensory conditions.

**Purpose:** The study had two purposes: 1) to analyze center of pressure (COP) distribution patterns under different surface and sensory conditions in children with idiopathic toe-walking (ITW) behaviors compared to age- and gender-matched subjects who exhibit normal gait; 2) to identify between-group differences in percent of maximum voluntary isometric muscle contractions (for select muscles) associated with differences in COP distribution. This abstract will inform the first purpose only.

**Methods:** Posturography was used to measure COP distribution under a matrix of firm (Fi) or foam (Fo) surface and eyes open (EO) or eyes closed (EC) conditions.

**Results/Findings:** Five children comprised the ITW group (3 male; mean age=8.73 years, range 5.92-11.08); 5 age- and gender-matched children comprised the control group (mean age=8.42 years, range 5.67-10.08). Independent t-tests revealed significant between-group differences for CoP anterior displacement under FiEC (P=.031), FoEO (P=.039) and FoEC (P=.039) conditions. CoP anterior displacement under FiEO (P=.080) conditions did not meet significance. Mean anterior displacement was less for the ITW group under all conditions.

**Discussion/Conclusions:** Preliminary analysis suggests that when standing under compromised sensory conditions, children with ITW achieve less anterior displacement than age- and gender-matched controls. These findings suggest that children with ITW use different strategies than control children to manage standing balance. Further analysis of muscle activation patterns and a larger sample size will be used to inform hypotheses about these differences.


Authors: Nicole Koskovich and Nikki Streleck – Physical Therapy
Faculty Advisors: Patti Berg-Poppe, Jae Yom, and Lisa Inglis

10:10 a.m. – 10:30 a.m. Hands-Only CPR: Assessing the Impact of Mini-Training Sessions to Increase the Knowledge and Confidence of College Students to Administer Care

Summary: Presentation of research that assesses the efficacy and confidence of participants in performing CPR before and after mini-training sessions were provided in compression only CPR. Study took place at the University of South Dakota and had around 150 participants. Training was conducted by nationally certified paramedics.

Purpose: Background: Our study emphasizes the importance and simplicity of teaching compression only CPR to college age students by trained paramedics who are able to provide hands on interaction and feedback as opposed to instructional videos and traditional CPR training. Cardiac Arrest is a leading cause of death with over 420,000 occurrences out-of-hospital annually in the United States (AHA, 2014). Victims’ chance for survival dramatically decreases without immediate and effective chest compressions. Unfortunately, 70 percent of Americans feel scared to perform CPR resulting in only 41 percent of cardiac arrest victims receiving the proper care they need in such a desperate circumstance.

Methods: Methodology: The purpose of this study was to assess the change in knowledge and self-confidence of students to administer Hands-Only CPR (also known as Compression Only CPR) as a result of outreach events with mini-training sessions administered by trained paramedics. A one group pre-test post-test quasi-experimental design was utilized with 156 participants at the University of South Dakota from October through December 2014. Descriptive statistics on the pre subscale scores, post subscale scores, and subscale change scores for both knowledge and self-confidence were computed. In addition, paired sample t-tests were conducted to compare pre and post-test knowledge and confidence scores and independent sample t-tests were ran to compare change in knowledge and confidence scores.

Results/Findings: Results/Findings have yet to be determined. Research is still be analyzed.
Discussion/Conclusions: This study provides insight into the viability of providing compression only CPR in lieu of the traditional CPR. Likewise, this study supports having individuals trained at an early age (such as while in college) to provide bystander care for someone experiencing cardiac arrest, particularly in rural areas where it may take significantly more time for trained professionals to arrive to administer care. Hands-Only CPR has only picked up momentum as an alternative to CPR during the past few years. To date, most research has focused on the patient outcomes associated with Hands-Only versus Traditional CPR.

Authors: Eric Rupe – Health Sciences, and Cody Reed - Sociology
Faculty Advisor: Cassity Gutierrez

10:10 a.m. – 10:30 a.m. Multiple Comparisons of Mean Response Profiles in Longitudinal Studies

Summary: In longitudinal analysis, interest lies often in comparing parametric models over time. For example, if the trend over time is linear, commonly a test is performed to evaluate whether the rate of change in the mean response is the same for all treatment groups. For parametric models, treatment profiles can easily be compared using confidence bands. We discuss two methods of calculating the associated critical point for comparing several parametric models over time using simultaneous confidence bands.

Purpose: The main interest in longitudinal studies is to analyze changes in the response variable over time in relation to other co-variates such as treatment group. Our objective is to compare several parametric regression lines in the context of longitudinal data (when errors are correlated).

Methods: We discuss two methods (asymptotic normal distribution and re-sampling method) to calculate the associated critical point (c) to construct the simultaneous confidence bands.

Results/Findings: In this talk, we will use an example data to construct simultaneous confidence bands to compare the entire regression lines associated with several treatments in longitudinal studies.

Discussion/Conclusions: Two methods of calculating the multiplicity adjusted critical points are discussed. The first is based on the asymptotic multivariate normal distribution of the associated maximum test statistics. The second method is based on bootstrap approach where the subjects are re-sampled with replacement in order to keep the dependency between repeated observations on the same subject. The bootstrap based confidence band is observed to be conservative. The methods are applied to compare three drugs in a longitudinal study of FEV1.
Utilizations of Sensory Discrimination Training for Improving Balance and Function in Older Adults: A Case Study

Summary: This is a case report looking at plantar surface sensation related to balance in a female assisted living resident. The subject participated in a six week sensory discrimination intervention. This was a test-retest study design to assess if there were improvements in balance and sensory testing following the six week intervention program. The sensory integration intervention showed improvements in balance assessments.

Purpose: Elderly individuals suffer from a heightened risk of falling that comes with increased age. In the elderly population there may be decreased cutaneous sensation, which could attribute to a decline in sensorimotor functioning. This could lead to an increase in fall risk. The purpose of our research is to determine if the utilization of sensory discrimination training on the plantar surface of the foot improves balance in older adults.

Methods: Subjects: An 88 year-old female resident of an assisted living facility participated in the study. Materials and Methods: Pre- and post-test comparisons of sensory and balance tests were utilized including FES-I, 2-point discrimination and monofilament score of the plantar surface of the foot, R/L discrimination, TUG, gait speed, functional reach, and mCTSIB. The intervention included sensory stimulation to the plantar surface of the foot for a duration of 6 weeks.

Results/Findings: Results: Improvements were made in post-test areas of 2-point discrimination, R/L discrimination speed, TUG, gait speed, functional reach, and mCTSIB. The subject decreased her TUG score to 13.08s, putting her below the fall risk cutoff score.

Discussion/Conclusions: Discussion and Conclusion: Sensory stimulation intervention to the plantar surface of the foot exhibited favorable outcomes in improving balance and decreasing fall risk in this case study. Further research is needed to validate the efficacy of using sensory discrimination training to improve balance in elderly individuals.


Authors: Ramu Sudhagoni and Gemechis Djira – Public Health
Comparison of Electronic Cardiac Auscultation Results with Cardiac ECG and Echocardiogram

Summary: The purpose of our study was to retrospectively analyze data to determine the efficacy of using an electronic stethoscope paired with diagnostic software designed to detect cardiac abnormalities. Auscultatory results were then compared to ECG and echocardiogram results.

Purpose: Retrospectively analyze data to determine the efficacy of using an electronic stethoscope paired with diagnostic software designed to detect cardiac abnormalities. Auscultatory results were then compared to ECG and echocardiogram results.

Methods: The design was a retrospective analysis of preexisting data derived from a previous study. The population consisted of 77 participants ranging from 13-26 years of age with a near equal male to female distribution. This study was approved by the USD Institutional Review Board. An inclusion criterion was that each participant had to complete a screen consisting of a 2-D echocardiogram, 12 lead ECG, and auscultation with a 3MTM Littmann® 3200 electronic stethoscope paired with Zargis CardioscanTM software. All screens were performed by a registered or registry-eligible cardiac sonographer. Screening results were analyzed by a Board Certified Cardiologist to determine if medical follow-up was indicated. Data was de-identified and placed in table format for analysis.

Results/Findings: Fisher’s Exact test (alpha .05) and Kappa were used for analysis using SPSS 22.0. The results of Fisher’s Exact Test for the echo and ECG compared to electronic auscultation for abnormal findings were P=.289 (2-tailed) in supine and P=1.0 (2-tailed) in standing. Both of these values were shown to be insignificant. When comparing the need for follow-up via echo or ECG to significant abnormal auscultation results, Kappa values of .103 (slight agreement) in supine and -.047 (slight agreement) in standing were found.

Discussion/Conclusions: Based on our results, it appears the 3MTM Littmann® 3200 electronic stethoscope when paired with the Zargis CardioscanTM software does not accurately detect cardiac abnormalities in correlation with echo or ECG and has a high rate of false positives. Limitations to this study include a small sample size and an asymptomatic healthy population. An auscultatory device capable of analyzing heart sounds would be a valuable adjunct in the examination process of individuals especially in rural environments.
Student Perceptions of Telehealth

Summary: The purpose of this research study is to determine if perception of telehealth changes, either positively or negatively, based upon exposure to different telehealth technology through formal education or hands-on experience. A two-group pretest-post test design indicated that familiarity and perceptions of telehealth was positively influenced through both types of education.

Purpose: The purpose of this research study is to determine if perception of telehealth changes, either positively or negatively, based upon exposure to different telehealth technology through formal education or hands-on experience. This research will explore and build upon the current evidence of professionals’ perceptions of using telehealth (e.g. Glaser et al., 2010; Lee, 2013).

Methods: A two-group pretest-post test design was used in the study. Participants participated in the hands-on or educational group. The hands-on group had a sample size of four and the educational group had a sample size of five. The hands-on group required the participant to stay in a fully functional apartment suite equipped with telehealth technology. Each participant lived in the apartment for three days while actively using the technology. The educational group attended a one-hour lecture style session about telehealth. The hands-on and educational groups completed the Perception of Telehealth survey, created and tested for reliability by the principal and student investigators. The hands-on group also completed a post survey, the Telehealth Usability Questionnaire (TUQ). The TUQ assessed the experience with the technology.

Results/Findings: The Wilcoxon signed-rank was used to test the null hypothesis that education (hands-on or lecture) does not change perception, (α ≤ .05). The results were significant (p = .018) indicating that the participants’ familiarity and perceptions of telehealth did change through education in the positive direction. The Mann Whitney-U test was used to compare the hands-on group to the lecture education group (α ≤ .05).


Authors: Lori Hixon, Ally Lund, and Brock Bills – Physical Therapy  
Faculty Advisor: Patrick Hauer
Significant results were not found (p = .902) so we fail to reject the null hypothesis that the type of education does not make a difference in change of perception.

**Discussion/Conclusions:** The study results indicate preliminary support for education to positively influences student perceptions of telehealth. Therefore, if more hands-on or educational experiences are provided about telehealth, more positive perceptions on its use and familiarity may arise. More research is needed to provide further supporting evidence on a larger scale.


Authors: Ranelle Nissen, Scott Bailey, Brianna Jackson, and Amanda Mentzer – Occupational Therapy
Faculty Advisor: Ranelle Nissen

**The Influence of Exercise Training on Gait Speed in Senior Athletes**

**Summary:** At the National Senior Games from 2011 to 2013, athletes aged 50 and over voluntarily participated in a comprehensive fitness screen that included usual and fast gait speed measurements. This research project compared the gait speed information with participants' self-reported exercise training. Specifically, the effects of exercise duration and mode, and sport type, intensity, and quantity was investigated.

**Purpose:** With age, gait speed is an important indicator of not only physical fitness, but also functional mobility, independence, and mortality. Current research has focused on primarily community-dwelling older adults and disease states rather than high functioning seniors. The purpose of this study was to explore the details of gait speed in a high functioning population of senior athletes, specifically: (1) the influence of exercise duration and mode and (2) the influence of sport type, intensity, and quantity.

**Methods:** Participants (n = 923) of this study were registered to compete in National Senior Games competition between 2011 and 2013, and were at least 50 years of age. Usual (UGS) and fast gait speed (FGS) tests were administered on all participants. Athletes were grouped into categories of active and sedentary sport categories to reflect the intensity of their sport competition. Additional analysis was conducted on athletes registered for
more than one sport. Pearson correlations statistics, ANOVA, and REGWQ post-hoc testing were utilized in data analysis.

**Results/Findings:** Statistical significance ($P < .0001$) was present in the correlation of minutes of cardiovascular exercise per week to UGS ($r = .13$) and FGS ($r = .13$). Statistical significance ($P < .0001$) was also seen in the correlation of minutes of strength training per week to both UGS ($r = .14$) and FGS ($r = .16$). A statistically significant ($P < .0001$) correlation was found between total minutes spent exercising per week (strength and cardio) and both UGS ($r = .16$) and FGS ($r = .16$). When assessing sport type, there was significantly higher UGS found in the sports of archery (mean = 1.60 m/s) and racewalking (mean = 1.54 m/s). Significantly lower UGS was seen in swimming (mean = 1.32 m/s), shuffleboard (mean = 1.30 m/s), and horseshoes (mean = 1.30 m/s). No significant difference in UGS was found when comparing active versus sedentary sport or single versus multisport gait speeds.

**Discussion/Conclusions:** It was found that increased levels of physical activity in general, regardless of mode, were associated with improvements in UGS. A slightly higher correlation existed between strength training and increased UGS, and participants in the sport of archery (a sport where strength is crucial to success) exhibited significantly higher UGS than other sports. Therefore, the effects of strength training on gait speed should be further investigated. The results of this study indicate that higher level training, such as participation in a competitive sport, is vital to improving gait speed.

Authors: Laura Barber, Emily Divine, and Cade Kling – Physical Therapy
Faculty Advisor: Becca Jordre

11:00 a.m. – 11:20 a.m. **Benefits of Combined T3/T4 Therapy in T4 Monotherapy Patients with Persistent Hypothyroid Symptoms Despite Normal Serum TSH Values**

**Summary:** Hypothyroidism is a common endocrine disease with a long-standing treatment of T4 mono therapy supplementation. However, there is new evidence of deiodinase polymorphisms that affect the conversion of T4 to T3, resulting in subclinical physiologic wellbeing in hypothyroid patients despite normal serum TSH values. This presentation explores the varying hypotheses and discusses the potential shift in clinical management of the disease.

**Purpose:** Hypothyroidism is an endocrine disease affecting 1%-10% of people worldwide. Patients experiencing the varying states of thyroid hormone imbalance range in age from newborns to the elder population. Over the last 4 decades, a conventional method of treatment for hypothyroidism has been established among clinicians.
The American Association of Clinical Endocrinologists ruled that hypothyroidism should be treated with T4 alone, and this has served as the standard since. Yet recently, many treated hypothyroid patients experience associated symptoms of the disease despite appropriate pharmacotherapy and lab results reported in the normal range. The reasoning for this phenomenon is of great medical debate, and will be discussed in this review. One potential hypothesis is the ingested T4 supplementation is not being fully converted to the active T3 hormone in peripheral tissues in a subset of patients. To correct this problem, some medical professionals are again prescribing combined T3/T4.

**Methods:** The methods of my literature review were straightforward. Numerous reputable journal articles were researched and reviewed. The results were analyzed and pieced together to create the basis of my discussion.

**Results/Findings:** There is evidence of deiodinase polymorphisms that affect the conversion of T4 to T3. Any genetic abnormality will affect hormone concentrations and the pituitary gland. Thr92Ala of the D2 gene, has demonstrated decreased T4 to T3 activation. This genetic defect is associated with hypertension, insulin resistance, obesity, modifications of thyroid-pituitary feedback, cognitive dysfunction, and subclinical response to thyroid hormone pharmacotherapy. This variation is relatively common; calculated to be present in 16% of individuals and correlates with diminished physiological wellbeing in T4 monotherapy patients. These patients do not reach a reference range serum FT3/FT4 ratio, limiting availability of thyroid hormones in peripheral tissues regardless of normal range TSH values met with levothyroxine administration. The insufficiency of peripheral T3 production cannot be corrected with an increased dose of levothyroxine, as the resultant elevated T4 levels create an inhibitory effect.

**Discussion/Conclusions:** Thyroid dysfunction is the most common endocrine malady. Regulation of thyroid function can be difficult due to complex feedback regulation, genetic and environmental modifications, and uncertainty of some biological processes. Current literature is still supportive of T4 monotherapy as the mainstay treatment for hypothyroidism. Forward movements are being made with increased evidence of the astounding benefits of combined T3/T4 therapy--specifically in a subset of patients with impaired peripheral conversion of T4 to T3. Regardless of adequate serum TSH levels on T4 monotherapy, patients still experience a wide-range of hypothyroid symptoms. Forthcoming research has discovered a genetic polymorphism of the D2 gene that is potentially responsible for some of the unexplained disjoint. More research needs to be conducted, but the initial results are painting a clearer picture of the importance of combination therapy. With more evidence, a paradigm shift could change clinical management.

*Author: Keri Simonds – Physician Assistant Studies*
*Faculty Advisor: William Schweinle*
Valuation of Patient Centered Care and Attitudes Toward Evidence Based Practice: Preliminary Results

**Summary:** Patient-centered care has been qualitatively studied by Resnik and Jensen (1). Physical therapist experts who practice patient-centered care share common clinical reasoning characteristics, values and virtues, knowledge systems, and clinical practice styles. At the same time, the incorporation of evidence based practice (EBP) has become fundamentally important as it prioritizes patient outcomes.

**Purpose:** The purpose of this study was to examine the relationship between patient-centered care valuation and attitudes toward evidence-based practice (EBP).

**Methods:** A non-experimental web-based survey was distributed to a sample of convenience including 1000 randomly selected physical therapists accessed through APTA member list rental and 1696 clinical instructors affiliated with the University. The survey was comprised of general demographic questions, 4 EBP questions (2), and 51-items related to patient-centered care.

**Results/Findings:** The initial response rate was 6.86% (185/2696). The participants were 65.5% female with a mean age of 39±10.07 years, and a mean length of practice at 13.7±9.72 years. Total patient-centered care valuation predicted the number of times evidence was used to make clinical decisions (P=.000; R²=.181), how many articles a therapist read per month (P=.000; R²=.134), whether the respondent believed EBP helps with patient care decision making (P=.000; R²=.077), and whether the respondent reported an interest in learning or improving skills necessary to incorporate EBP into patient care (P=.000; R²=.097). Total patient-centered care valuation did not predict whether the respondent believed EBP takes into account patient preferences and was not associated with whether the respondent believed that strong evidence is lacking to support the interventions used in their care provision.

**Discussion/Conclusions:** Respondents with higher total patient-centered care valuation and behaviors were more likely to access evidence for use in practice and showed a greater readiness and interest in reading and incorporating the accessed evidence into patient care.


*Authors: Paul Bindert, Tyler Turbak, and Andrew Menigoz – Physical Therapy*
The Effects of Ischemic Compression and Massage on Pain Pressure Threshold in Subjects with Muscle Trigger Points in the Shoulder Girdle

Summary: Soft tissue mobilization may increase PPT and thus decrease pain in an individual. Ischemic Compression and traditional Swedish massage are two techniques used to address muscle pain and tightness. Our research will study the effects of both these techniques on Pain Pressure Threshold in the neck and scapular area.

Purpose: The purpose of this study is to determine the effects of ischemic compression compared to Swedish massage on PPT and perceived pain in individuals with muscular trigger points in the shoulder girdle.

Methods: Thirty subjects over the age of 18 are currently being randomly assigned to one of two treatment groups (ischemic compression or soft tissue mobilization) that focused on treatment of trigger points found in the neck and scapular area. The subjects received a 10-12 minute treatment session and PPT was assessed over trigger point areas before and after treatment. To date at time of submission we have collected data on 9 subjects and still are collecting data.

Results/Findings: The results from preliminary data indicate an increase in PPT following either ischemic compression or soft tissue mobilization intervention with a slight trend favoring ischemic compression over soft tissue mobilization.

Discussion/Conclusions: Preliminary data indicates that ischemic compression and soft tissue mobilization is effective in increasing PPT in individuals with trigger points in the neck and scapular area.

Authors: Jessica Hill, Eric Byrnes, and Zac Sousek – Physical Therapy
Faculty Advisors: Richard Ekstrom and Kory Zimney

Ecological, Relationship Based Model of Children’s Subjective Well-Being: Perspectives from the United States and Ten Other Countries

Summary: The study examined the international relevance of an ecological, relationship-based model of children’s subjective well-being with samples of 12-year-old children from the United States (n = 784; Mage = 12.63, SD = .55) and 10 other countries: Algeria, Brazil, Chile, England, Israel, Romania, South Africa, South Korea, Spain, and Uganda (n = 784, Mage = 12.06, SD = .61). To measure subjective well-being, all children
completed the Children’s Worlds survey, which includes individual factors, contextual factors of home and family, life and neighborhood, school, and peers, and subjective well-being measures for life satisfaction, mental health, and self-image. The strongest predictors of subjective child well-being were relationships, school, males, and neighborhood quality. The results affirm the international relevance of an ecological, relationship-based model of children’s subjective well-being.

**Purpose:** To assess the international relevance of an ecological, relationship-based model of children’s subjective well-being.

**Methods:** Children from mainstream schools in all countries completed the Childrens Worlds survey. Correlation and hierarchical regression analyses were conducted with representative samples of 12 year of children.

**Results/Findings:** Individual and contextual factors predicted subjective well-being from samples of 12-year-old children from the United States and a representative sample of 12-year-old children from 10 other countries: Algeria, Brazil, Chile, England, Israel, Romania, South Africa, South Korea, Spain, and Uganda. Relational, school, gender, and neighborhood variables were found to be the strongest predictors of children's well-being for children from all countries. The current study adds neighborhoods as a critical context for children's subjective well-being and affirms the relevance of an ecological, relationship-based model of subjective well-being in examining International samples of children.

**Discussion/Conclusions:** This study of children from 11 countries has global implications for understanding children's perceptions of their well-being. The international relevance of an ecological, relationship-based model of subjective well-being was confirmed in this study, providing a framework for future studies assessing children's subjective well-being in various cultural, environmental and socio-emotional contexts. Additional research using the ecological, relationship-based model within and between countries and cultures is warranted.


Authors: Michael J. Lawler – School of Health Sciences
Gait Speed and Disease in Senior Athletes

Summary: Data was collected on senior athletes over the age of 50 competing in the 2011 and 2013 National Senior Summer Games. The focus of our research was to determine if an association exists between usual and fast gait speed and significant adverse events such as breathing problems, cancer, diabetes, falls, heart disease, hyperlipidemia, hypertension, osteoporosis, and stroke. If there is an association present, what gait speeds should raise health concerns in this unique population.

Purpose: Gait speed is a feasible and accessible assessment tool that has strong intrarater, interrater, and test-retest reliability. It has been validated as an assessment of mobility, cognitive decline, and fall risk in older adults. There are empirically demonstrated associations between declining gait speed and significant adverse events such as cancer, diabetes mellitus (DM), hyperlipidemia, cardiovascular abnormalities, respiratory dysfunction, and fall risk in community dwelling elderly (CDE). However, there is minimal research on higher functioning older adults. Thus, the purpose of this study is to determine if gait speed in high-functioning senior athletes (SA) is also associated with disease and, if so, what speeds should raise health concerns for this unique population.

Methods: Subjects were 50 years or older and registered in the 2011 and 2013 National Senior Summer Games. Gait speed was tested at two speeds, usual gait speed (UGS) and fast gait speed (FGS). Subjects self-reported the presence of: breathing problems, cancer, DM, falls, heart disease (CVD), hyperlipidemia, hypertension (HTN), osteoporosis, and stroke. Logistic regression, ROC analyses and Youden's index were used to determine which indicator was better and to estimate cutoff speeds for disease concern.

Results/Findings: Results of logistic regression found a significant difference between athletes with disease present (ADP) (n = 634) and healthy athletes (HA) (n = 283) on UGS (P < .0001). A significant difference was also found between ADP (n = 474) and HA (n = 196) on FGS (P < .0001). Logistic regression showed significant differences for CVD (P=.0017), HTN (P=.0001), and DM (P=.0060) on UGS. For FGS, significant differences were found for CVD (P=.0182), hyperlipidemia (P=.0478), and HTN (P=.0007). Effect sizes ranged from small to medium (f = .12 to .26). UGS was associated with disease having an ROC =.5947 and an odds ratio of 4.438. ROC for FGS was .6153 with an odds ratio of 2.277. Youden's indices provided a cutoff of 1.51 m/s and 1.95 m/s for UGS and FGS respectively.
Discussion/Conclusions: High functioning SA who indicated a past medical history of CVD, HTN, and DM showed significant decreases in UGS while those that indicated a presence of CVD, HTN, and hyperlipidemia showed significant decreases in FGS. Neither UGS nor FGS were found to be superior at predicting disease in this population though both appear to be another informative tool for screening the health of SA. SA with UGS of 1.51 m/s or FGS of 1.95 m/s with no other indicators of disease may be encouraged to have further medical screening.

Authors: Kevin O’Neil, Matt Bosma, and Caitlin Vance – Physical Therapy
Faculty Advisor: Becca Jordre

2:30 p.m. – 2:50 p.m.  

A Missing or Malformed Pectoralis Major Muscle and Its Connection with Poland Syndrome: A Case Report

Summary: People with even mild congenital malformations of the musculoskeletal system require lifelong monitoring and management that preferably begins at birth. Unfortunately, some mild congenital malformations of the musculoskeletal system have often been disregarded as asymptomatic in the neonate but may in fact be associated with a variety of internal anomalies, some serious. These anomalies, if not identified in the neonate, are found incidentally through imaging for other reasons later in life. A congenitally missing or malformed pectoralis major muscle (MM/PMM) is a good example of this situation. The purpose of this case report is to increase awareness of a MM/PMM and discuss its connection with Poland Syndrome while providing evaluation and treatment suggestions in physical therapy.

Purpose: To report on the examination and interventions of a patient with musculoskeletal impairments and pain secondary to a congenitally missing costosternal head of the pectoralis major and pectoralis minor muscles.

Methods: MRI imaging of the thorax and abdomen. Physical therapy examination of the patient's shoulder. The patient was instructed in a home exercise program to address the problems the patient was having with the shoulder.

Results/Findings: The patients had a radiological study of the (R) shoulder, an MRI of the (R) shoulder and thorax, a cardiac work-up with echocardiography and an electrocardiographic study. The MRI of the shoulder revealed not only a MM/PMM, but also a missing pectoralis minor muscle on the right side. A small enthesopathic cyst was found at the greater tubercle attachment of the infraspinatus tendon. No other pathology was found in the musculoskeletal system including the shoulder joint, ribs, vertebral bodies,
sternoclavicular joint, and acromioclavicular joint. The electrocardiography and echocardiography exams revealed mild mitral and tricuspid regurgitation and sinus rhythm with an RSR. These findings were considered normal variants and not abnormalities requiring any treatment. Upward rotation of both scapulae was restricted during shoulder flexion to end range. With an inclinometer on the spine of the scapula it was determined that he only had about 25º of upward rotation of the scapulae.

Discussion/Conclusions: The patient did not have any significant positional deviations of the (R) scapula as compared to the (L). Both scapulae were restricted in the motion of upward rotation during shoulder elevation. Shoulder flexion, abduction and external rotation movements were somewhat restricted for a patient of his age. He had weakness of (R) internal rotation and horizontal adduction which would be expected with MM/PMM. There were no internal anomalies found in this individual with MRI imaging. Physical therapy interventions were able to alleviate the pain the patient was experiencing around the scapula.

References:


Author: Richard Ekstrom – Physical Therapy

2:30 p.m. – 2:50 p.m. The Role of Occupational Therapy in Supporting the Federal Strategic Action Plan on Services for Victims of Human Trafficking in the United States

Summary: Non-experimental survey research was used to explore areas of occupation that are most affected in the lives of victims of human trafficking. Survey results identified leisure, education, activities of daily living (ADLS), instrumental activities of daily living (IADLS) as the three areas of occupation that are most affected. Occupational therapy practitioners can empower survivors of human trafficking to identify and reform problematic beliefs, occupational choices and performance patterns to address the intrinsic and extrinsic barriers to achieving increased overall well-being and occupational performance.
**Purpose:** The United States Department of Justice developed a Federal Strategic Action Plan on Services for Victims of Human Trafficking in the United States, 2013-2017, has called for an evidence-based, multidisciplinary approach to support the emotional, social and physical well-being of victims (2014). The purpose of this study was to support that action plan by utilizing the experiences of frontline service providers to identify the areas of occupation that are most affected in the lives of victims of human trafficking. Specifically we wanted to know, does the experience of human trafficking predict difficulty in any certain areas of occupation?

**Methods:** The research design used in this study was a non-experimental survey design. This design was used to measure the characteristics of a population, specifically to identify occupational performance deficits experienced by survivors of human trafficking. Participants: Sixty-three front line service providers were invited to voluntarily participate in the study. The participants for the survey were from a convenience sample acquired through nationally and locally known non-profit organizations who provide services for survivors of human trafficking. Inclusion criteria were 1) having maintained contact with survivors of human trafficking no less than 6 months and 2) working with survivors of either genders, ages 18-64. Contact information was obtained from two nonprofit organizations to identify agencies, researchers and professionals that fit our inclusion criteria.

**Results/Findings:** Using descriptive statistics and analyzing frequency, survey results identified leisure, education, ADLs and IADLs as four main areas of occupation that are most affected in the lives of victims of human trafficking. Specifically, results indicate the following areas as difficult for human trafficking survivors to perform as indicated by the survey question receiving a median score less than 3 indicating that the survivor was unable to or had difficulty performing the activity: identifying appropriate leisure activities; identifying methods for obtaining information and skills; participating in formal and informal education activities; able to send, receive, and interpret information using a variety of forms of communication; plan or move around using public or private transportation; prepare shopping lists and complete money transaction to purchase items; obtain and use supplies for bathing and showering and hygiene and grooming, select appropriate clothing and accessories.

**Discussion/Conclusions:** In a study by Abas et al, (2013), female victims reported experiencing a variety of occupational deficits, including difficulties with daily activities, securing safe employment and housing, and a lack of money. Literature also indicates that human trafficking survivors manifest traits including social withdrawal and loss of personal initiative and autonomy (Hodge, 2014). Interventions for human trafficking survivors should be holistic, and survivor-focused, providing client-centered care for individual's current and changing needs (Hom & Woods, 2013). Occupational therapy has a valid role in treating survivors of human trafficking due to the profession's client-centered care and holistic viewpoint. Through the use of the Model of
Instrumentalism in Occupational Therapy (MIOT) (Ikiugu, 2015), occupational therapy practitioners can empower survivors of human trafficking to identify and reform problematic beliefs and occupational choices.


Authors: Shana Cerny, Hannah Softley, and Nicole Madden – Occupational Therapy
Faculty Advisor: Shana Cerny

2:30 p.m. – 2:50 p.m. Strategies for Daily Activities Among Older Adults with Low Vision

Summary: The goal of this phenomenological study was to describe strategies used to perform daily activities among older adults with low vision. We conducted interviews with 10 participants with low vision in their home environment. Seven themes emerged from the data, including lighting, auditory, enlargement, tactile, personal assistance, organization and memory, and other strategies. We found older adults with low vision use a variety of strategies during daily occupations to augment remaining vision for the performance of everyday activities.

Purpose: As the older adult population grows, more Americans are experiencing age-related vision loss, or low vision, due to conditions including macular degeneration, glaucoma, and diabetic retinopathy. Older adults with low vision may experience difficulty performing self-care tasks, household activities, and even social or leisure activities (Alma et al., 2011). However, several strategies can be used to augment remaining vision and facilitate participation in desired occupations. Specific strategies include viewing techniques, illumination, tactile sensation, and personal assistance (Smallfield et al., 2013); however, little research is available to support the use of these strategies in practice (American Occupational Therapy Association, 2014). Therefore, the purpose of this study was to describe the strategies older adults with low vision use to perform daily activities.

Methods: We conducted a naturalistic, phenomenological study of ten older adults with low vision from urban and suburban areas. They participated in semi-structured interviews to describe their experiences of living with
low vision and the strategies used to support daily activities. We photographed the strategies and equipment used by the participants and logged field notes to supplement interview data. We transcribed the audio-recorded interviews verbatim and analyzed the data by thoroughly reading transcripts, identifying themes, and then coding the data. Three researchers coded the data, discussed their findings, identified exemplars, and summarized the findings.

**Results/Findings:** Seven themes emerged that described the strategies used to support daily activity, including lighting, auditory, enlargement, tactile, personal assistance, and organization and memory. Participants noted that natural and task lighting are vital for completion of activities such as color identification and reading, but excess light can create glare, hindering vision. Auditory strategies included listening to audio books and recognizing people by voice. Participants used enlargement with large print materials and labeling items like medication bottles with large print markings. Tactile strategies such as raised dots on appliances and dials were used and participants often combined their sense of touch with memory to complete self-care tasks and household activities. Personal assistance was helpful to replace or reduce the need for vision during tasks such as shopping and cleaning. Organization and memory were important; storing items in specific locations reduced the need for vision.

**Discussion/Conclusions:** We found older adults with low vision use a variety of strategies during daily occupations to augment remaining vision for the performance of everyday activities. The results of this study provide preliminary support for healthcare professionals to teach and train older adults with low vision strategies to support engagement in daily tasks. Further empirical research is necessary to support these findings across a broader population.


**Authors:** Stacy Smallfield, Brooke Hillman, Paige Liess – Occupational Therapy and Jennifer Kaldenberg and Sue Berger – Boston University, Faculty  
Faculty Advisor: Stacy Smallfield
Implementation of Anterior Cruciate Ligament (ACL) Injury Prevention Programs in the State of South Dakota

**Summary:** To determine if there are anterior cruciate ligament prevention programs implemented by coaches for high school athletes in the state of South Dakota.

**Purpose:** The purpose of this research was to determine if there are ACL prevention programs implemented by coaches for high school athletes in the state of South Dakota.

**Methods:** A survey link was emailed to the director of South Dakota High School Activity Association (SDHSAA), who then distributed the email to 1417 high school coaches in the state of South Dakota. One hundred thirty-one of the 1417 coaches responded to the survey (9.24% response rate).

**Results/Findings:** The results indicated that 86.3 percent of South Dakota High School coaches are not currently implementing an ACL prevention program as a component of their coaching, however 96.0 percent of coaches who responded to the survey question would implement an ACL prevention program if it were made available to them. Although coaches believe ACL injury prevention programs are effective (94.2%), lack of knowledge on prevention programs was reported as the main reason for not implementing a program (73.7%).

**Discussion/Conclusions:** ACL injury prevention programs are not being implemented in the state of South Dakota. Coaches would utilize an ACL prevention program if provided.

Authors: Jenna Stroup, Kristina Goldstine, and Andrea Joy – Physical Therapy
Faculty Advisor: Lana Svien

Quality of Life for Pediatric Patients with Daytime Urinary Incontinence

**Summary:** Eligible subjects provided information about urinary incontinence (UI) symptoms and quality of life (QOL) before treatment for UI. Symptom severity and QOL were analyzed pre-treatment.

**Purpose:** The purposes of this study were several: 1) to confirm research findings asserting that children with UI symptoms report lower QOL; 2) to assess changes in UI symptoms and QOL following UI management by a physical therapist; 3) to explore relationships between changes in UI symptoms and changes in pediatric QOL following treatment. These results inform the first purpose only.
**Methods:** Children ages 5-18 referred to a specialty clinic for treatment of daytime UI with or without constipation or encopresis met inclusion criteria. Exclusion criteria included children who had nocturnal enuresis alone or children with neurogenic bladders. Before treatment, the Dysfunctional Voiding Symptom Score1 (DVSS) was used to assess symptom severity by parent report. At the same time, the KINDL2 questionnaire, completed by the child, was used to assess QOL.

**Results/Findings:** Subjects included 1 female (8.83 years) and 1 male (10.33 years). Both subjects (raw scores=18, 12 respectively) scored above the DVSS threshold (raw score=8) for symptomatic UI. Compared to normative populations, both subjects (female subject=57.29; male subject=52.08) scored below the normative range (68.2-85.46, female; 68.01-85.33, male) for total QOL. An examination of KINDL subscales revealed lower than normal scores for both subjects in the areas of emotional wellbeing, family, friends, and school. The male subject also reported lower than normal physical wellbeing. Self-reported self-esteem was within normal range for both subjects.

**Discussion/Conclusions:** Preliminary results agree with research asserting children with symptomatic UI report lower QOL than their healthy peers. Areas of concern include QOL related to emotional wellbeing, family, friends, and school. Future research will undertake purposes 2 and 3 above, utilizing a larger sample.

**References:**

**Authors:** *Alissa Minnaert and Emily Rausch, Physical Therapy*

**Faculty Advisors:** *Patti Berg-Poppe and Becca Jordre*

**Clinical Partners:** *Robin Lund and Christine Stephenson*
Donepezil and Memantine in the Treatment of Alzheimer’s-Type Dementia

Summary: Current anti-Alzheimer’s Disease (AD) agents, including donepezil and memantine, are designed to manage the symptoms but not cure the disease. In a review of current published research, donepezil has shown to have an effect throughout the process of AD particularly in the mild to moderate stage, while memantine has an effect in the more severe stages. Although modest effect sizes are seen in the analysis, both medications are safe and reduce costs. As a result and with no superior alternatives, donepezil and memantine should be primary treatment options for AD.

Purpose: There has been much debate as to how beneficial cholinesterase inhibitors (ChEIs), memantine and the combination of the two are in treating AD. The main purpose of this paper is to look into the effects of ChEIs and memantine on delaying the symptoms of AD and in addition the safety and tolerability of each drug will be an important factor to consider as well. Lastly, as in most medication use, but particularly medications used for a chronic progressive disease like AD, the cost of treatment with these medications will be investigated.

Methods: Through EBSCO host and PubMed databases, double-blind randomized controlled trials (DBRCT) or meta-analyses of DBRCT’s will be reviewed for effectiveness of the two anti-AD agents. Along with this condition, all information and referenced articles will have been published within the past ten years. The results of analyzed research are reported into categories of donepezil, memantine, donepezil-memantine combination, and cost-effectiveness.

Results/Findings: Results suggest donepezil is most effective in mild to moderate AD, memantine in moderate to severe AD which follows FDA recommendations of their use. Furthermore, when patients with AD reach a moderate to severe stage the addition of memantine to an already prescribed donepezil has the potential to enhance the effectiveness of their actions. Both donepezil and memantine are safe and well-tolerated along with also providing cost-savings for the patient and health care facilities.

Discussion/Conclusions: Donepezil and memantine without a doubt cannot be considered disease-modifying medications. It should not be surprising then that studies revealed donepezil and memantine do not provide a delay in the death process. The therapeutic effect of these medications consists of providing cognitive enhancement and decreasing the symptoms of AD. Thus when evaluating the efficacy of donepezil and memantine, impeding the death process should not be a primary outcome measurement as it is in most medication research. Rather, donepezil and memantine should be measured by how effective they are at maintaining patients in an independent state.
Anterior Cruciate Ligament Graft Selection; Specifically Patellar Tendon Graft Versus Hamstring Tendon Graft

**Summary:** My presentation will talk about and compare the different anterior cruciate ligament graft selections for reconstructions. I will discuss the benefits and drawbacks for specific grafts and talk about which grafts appear to be optimal for specific patient groups.

**Purpose:** The purpose of the present review is to describe some background information on the ACL injury, compare different surgical techniques (specifically, differences in ACL graft selections), and compare the outcomes and results reported in some research articles describing the dissimilarities in the different specific techniques used to treat an ACL injury.

**Methods:** Articles and information obtaining to this research topic was gathered from a computer-based literature search engine. EBSCOHOST was the online-resource used to obtain the scientific literature presented in this paper. Only peer reviewed journal articles published within the last ten years (2004-2014) were included in this analysis. Further more, only human subjects and articles published in English were utilized.

**Results/Findings:** From the literature reviewed, there revealed no overwhelming evidence that one graft was strictly superior. It appears that many factors must be considered when selecting the most reliable graft based on individual patient profiles.

**References:**

**Author:** Christopher Peluso – Physician Assistant Studies
**Faculty Advisor:** William Schweinle
**Discussion/Conclusions:** More focused research needs to be done comparing similar specific patient profiles in order to offer the most appropriate ACL graft that offers the best outcomes for each individual.

Author: Trevor Engelson – Physician Assistant Studies
Faculty Advisor: William Schweinle

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**3:20 p.m. – 3:40 p.m.**

**Intervention Strategies Used by Occupational Therapists Working in Mental Health to Enhance Clients’ Occupational Performance**

**Summary:** In this study, we examined the intervention strategies that were used by occupational therapists working in two mental health facilities to treat their adult clients with mental health diagnoses, and the theoretical frameworks from which those intervention strategies were derived. Data were gathered using retrospective medical record reviews. The data were analyzed to determine the extent to which identified therapy goals were achieved, and the theoretical conceptual practice models that were predominantly used by occupational therapists. The findings, based on only one facility from which data have so far been gathered, indicated that the identified therapy goals were largely not met.

**Purpose:** In recent years, the American Occupational Therapy Association (AOTA) has called for occupational therapists to emphasize evidence based practice (EBP) in their clinical work. However, few studies have been conducted to investigate the effect of occupational therapy interventions in mental health. The purpose of this study was to contribute to the push towards EBP by identifying empirically the strategies that are used by occupational therapists in select mental health facilities in the treatment of their clients with mental health conditions and the theoretical models on which these strategies are based (Ikiugu, 2007; Kielhofner, 2009). Further, we wanted to investigate the clinical effectiveness of those intervention strategies by determining the extent to which occupational therapy clients goals were achieved following intervention.

**Methods:** The study was conducted using a retrospective design (Portney & Watkins) in which medical records of clients treated by occupational therapists at the Health Services Center [HSC] in Yankton, South Dakota, were reviewed and the following data extracted: patient medical record number; gender; diagnosis; age; educational level; occupational therapy goals and whether they were achieved, not achieved, or in progress; and intervention strategies used by therapists to treat the clients. Content analysis was used to determine the theoretical frameworks on which the interventions were based. Chi-Square goodness of fit analysis was conducted to determine whether or not the majority of therapy goals were achieved. Cross-tabulation of level of education, diagnosis, and theoretical model on which intervention strategies were based against the state of
achievement of therapy goals was used to determine if the former variables were correlated with whether or not therapy goals were achieved.

**Results/Findings:** Chi-square analysis indicated that the identified therapy goals were largely not achieved, $\chi^2$ (df=2, N=71) = 94.17, p<.001. Out of the 71 goals established for 59 patients, only 1 (1.4%) was achieved. Eight (11.3%) were not achieved, and 62 (87.3%) were in progress. The three theoretical conceptual practice models on which the majority of the intervention strategies were based were client-centered approaches (32% of the time), Behavioral/Cognitive Behavioral model (32% of the time), and the Model of Human Occupation (29.3% of the time), $\chi^2$ (df=5, N=181) = 138.53, p<.001. Gender, level of education, diagnosis, and the theoretical models on which interventions were based were not correlated with the goal achievement status. Data analysis is ongoing, and the researchers are planning to conduct retrospective medical record reviews in a second mental health facility.

**Discussion/Conclusions:** Based on the data analyzed so far, it is not clear how effective occupational therapy interventions are in helping mental health clients achieve therapy goals. It is not clear why 87% of the goals were in progress while only one goal was achieved. One possibility may be that the therapy goals that were identified were not really suitable for occupational therapy. Examples of the goals addressed by occupational therapists included: Client will attend 15% of his scheduled Social Circle groups; and Patient will identify 3 coping techniques to use while at HSC and or in the community. The first goal is appropriate for OT because it is consistent with social participation, which is an important occupational area according to the AOTA (2014). However, it is not functional. The second goal is not occupation-based and therefore is not truly an appropriate goal for occupational therapy. We will be able to reach firmer conclusions once we complete data gathering.


Authors: Moses Ikiugu, Ranelle Nissen, Katie Beech, McKinsie Fuoss, and Anna Smith – Occupational Therapy  
Faculty Advisor: Moses Ikiugu
Systematic Review on Occupational Therapy Interventions for Adults with Alzheimer’s Disease and Related Disorders

Summary: This session will describe the process and outcome of a systematic review completed in collaboration with the American Occupational Therapy Association on the effectiveness of occupational therapy interventions for adults with Alzheimer’s disease and related disorders for the performance of daily occupations. We will outline the process involved in completing the systematic review and share specific findings. Implications for practice, education, and research will be discussed.

Purpose: Every 67 seconds in the U.S. another adult is diagnosed with Alzheimer’s disease (Alzheimer’s Association 2015). There are over 5 million American adults living with Alzheimer’s disease, a number that is expected to grow to 16 million by 2050 (Alzheimer’s Association, 2015). It is the most expensive health condition in the U.S.; currently one in five Medicare dollars are spent on Alzheimer’s disease or a related dementia. Alzheimer’s disease causes memory loss that impairs the performance of daily activities (Alzheimer’s Association, 2014). This can lead to difficulties in planning, problem solving, judgment, and completing familiar activities. It often leads to decreased participation in work, leisure, and social activity as well as changes in mood and behavior (Alzheimer’s Association, 2014). Currently there is no prevention or cure for the disease. Due to the rise in prevalence of Alzheimer’s disease and related dementias and the significant impact it has on participation in daily activities, we completed a systematic review of the literature on the effectiveness of occupational therapy interventions with this population. Specifically, the purpose of this review was to describe the evidence for the effectiveness of interventions designed to establish, modify, and maintain activities of daily living (ADLs), instrumental activities of daily living (IADLs), leisure, and social participation for adults with Alzheimer’s disease and related disorders.

Methods: We completed a systematic review of the literature which included a search of Medline, Cochrane, PsychInfo, CINAHL, and OT Seeker databases for potential evidence. Hand searching of reference lists and most common journals was also completed. Titles and abstracts of 2486 articles were reviewed according to established inclusion and exclusion criteria by two independent reviewers, of which 256 were retrieved for full review. Key information from each article retained after full review was recorded on an evidence table for qualitative data analysis. U.S. Preventive Services Task Force (2014) levels of certainty and grade definitions were used to describe the strength of evidence.

Results/Findings: A total of 52 articles met inclusion criteria. This included 14 systematic reviews, 12 randomized controlled trials, 16 articles describing nonrandomized two-group pretest posttest designs and 10 articles describing one-group pretest, posttest designs. Articles were categorized into 5 themes: 1) occupation-
based interventions; 2) interventions for sleep performance; 3) physical exercise interventions; 4) cognitive interventions; and 5) multicomponent interventions. We found strong evidence supporting occupation-based interventions, physical exercise, and error reduction learning/prompting for the performance of daily activities.

**Discussion/Conclusions:** Several interventions within the scope of occupational therapy are effective at enhancing the performance of daily activities for adults with Alzheimer's disease and related dementias. Occupational therapy practitioners should use occupation-based interventions and error reduction techniques as part of routine intervention with this client population. Additionally, they should ensure that physical exercise is integrated into the daily routine of adults with dementia to enhance occupational performance and delay functional decline. Future research should focus on establishing consensus on type and dosage of exercise intervention.

**References:**

Authors: **Stacy Smallfield and Cindy Syrovatka – Occupational Therapy**
Faculty Advisor: **Stacy Smallfield**
1. **Autism Spectrum Disorder Compared and Contrasted Between the United States and the United Kingdom**

   **Summary:** Autism Spectrum Disorder has continued to be on the rise on a global scale. More children are diagnosed with each year, and there have consequently been effects on families and societies as a result. Due to the increased likelihood of diagnosis, it is important to understand the effects and current research on such a significant global health issue. Literature regarding Autism Spectrum Disorder in both the United States and the United Kingdom was reviewed.

   **Purpose:** To compare and contrast Autism Spectrum Disorder research, magnitude, most affected, effects and risk factors between the United States and the United Kingdom through the use of literature review.

   **Methods:** 15 scholarly journal articles and literature pieces pertaining to Autism Spectrum Disorder in the United States and/or United Kingdom were reviewed and analyzed.

   **Results/Findings:** It was found that there were quite a few similarities between the two countries in regards to Autism Spectrum Disorder. Primary impacts on families were similar. Secondary impacts on society differed slightly. Research was more apparent within the United States. The United States' rate of diagnosis continues to increase whereas the United Kingdom rates have plateaued.

   **Discussion/Conclusions:** Autism Spectrum Disorder has had a profound impact in both the United States and the United Kingdom. The need for education about the condition is necessary for the purpose of advocacy and increased awareness among society. Further research is also imperative in order to work to better understand more specific causes and how to best help those living with Autism Spectrum Disorder.

   *Author: Courtney Visaya – Health Sciences*
   *Faculty Advisor: Becky Wolff*

2. **Technology/Digital Media Addiction and Increase in ADHD Prevalence**

   **Summary:** This research paper looks at the similarities of patients with ADHD and people with current diagnosable addictions. This includes looking at the dopamine system, behaviors, and areas of the brain affected. The paper ponders the idea that an increase in use of technology/media in our society is effecting the brain of patients similarly to ADHD and how this may be causing an increased prevalence of ADHD in the US population.
**Purpose:** The rapid increase of personal technology devices over the past decades has changed how society functions in everyday life. The overuse of technology/digital media has great potential to cause neuroplastic changes in the dopaminergic systems in brain function leading to adverse outcomes. One of these possible outcomes may be the development of ADHD-like symptoms, which in turn could be leading to the increase in ADHD prevalence seen in the United States. The purpose of the present paper is to review the brain function and behaviors of people suffering from addiction and ADHD to analyze a possible correlation between increased use of technology/digital media and ADHD diagnoses. The present paper will also review the current difficulties in diagnosing ADHD and how the subjective nature of diagnosing ADHD is problematic.

**Methods:** Research for the present paper was conducted primarily by searching of academic databases. The searched databases included: EBSCOhost, ScienceDirect, Medline, PubMed, and JSTOR. Another resource utilized for searching was Google Scholar. Information and research articles from CDC.gov were also utilized. Keywords that were used in database searches included ADHD, dopamine, addiction, digital media, technology, neuroplasticity, and prevalence. The searches involved combinations of the keywords as well as individual searches of the keywords. When searching the databases all articles were considered for research. This included quantitative and qualitative research papers, meta-analysis, original research, and reviews of research papers. There was no criterion for time of research and papers from mid 1990's to present were used. Lastly, citations were made using End Note 7 or standard MLA format. Citations throughout the paper are also made using MLA regulations.

**Results/Findings:** ADHD has both genetic and environmental causes. The brain's dopamine systems function ranges from normal dopamine release, dopamine recognition through receptors, and breakdown and recycling of dopamine in neural junctions. It has also been shown that activation of D1 receptors increases plasticity and neural changes in the brain. In patients with ADHD, behaviors include impulsivity, hyperactivity, and lack of ability to delay gratification. The regions of the brain responsible for these behaviors include the pre-frontal cortex and the nucleus accumbens, which have been shown to have reduced DA levels in ADHD patients (Tripp, 2007). People with addictions have changes in the dopaminergic system in the brain, specifically altered action of D2 receptors. This alteration takes place in the pre-frontal cortex and nucleus accumbens. There is no formal technology/digital media addiction diagnosis. Society currently is at its highest rate of technology/media consumption.

**Discussion/Conclusions:** If addictions to technology/digital media have similar alterations to brain function as current diagnosable addictions, then there may be an argument that patients suffering from these addictions could exhibit ADHD like symptoms leading to misdiagnoses of clinical ADHD. An argument can also be made that technology/digital media addictions do not cause behavioral changes that mimic ADHD by changing dopaminergic pathways, but rather an inherent biological altered dopamine system causes both of these outcomes. If providers were able to objectively diagnose ADHD it may lead to being able to recognize mimicking symptoms that stem from such things as technology/digital media addictions in order to treat those problems at their source. Despite all of the research that has been done, ADHD is still not fully understood on the biochemical level, which makes it very difficult to link or differentiate between ADHD-like symptoms and addiction-like symptoms.


Author: Mitch Grieve – Physician Assistant Studies
Faculty Advisor: William Schweinle

3. The Effect of Primitive Reflexes on Handwriting Fluency Following Multisensory Handwriting Intervention

Summary: Elementary school children participated in a 3 week intensive summer handwriting camp. They were evaluated for primitive reflexes and handwriting speed pre and post intervention. The hypothesis for the study was that the presence of unintegrated reflexes would present a compounding influence on handwriting fluency. A multisensory approach was utilized in order to facilitate reflex integration and increase writing speed.

Purpose: The purpose of this study is to determine the effects of primitive reflexes on handwriting fluency following multisensory handwriting intervention.

Methods: After reviewing the literature on handwriting and persistent primitive reflexes, it was determined that a nonrandomized, controlled pretest and post-test design was most appropriate for this research. The participants for this study were from a convenience sample of school-aged children whose education levels ranged from kindergarten through fifth grade. The children were recruited from an after school program that took place in the Midwest. The Wold Sentence Copying Test (Maples, 2003) was given as a pretest and posttest measure and was the instrument used to determine handwriting performance. The presence of primitive reflexes was determined from reflex tests outlined by Athena Oden (2006). The multisensory treatment included but was not limited to: kinesthetic learning, visual motor activities, handwriting practice, in-hand manipulation activities to improve dexterity and speed, body awareness, and proprioceptive activities.

Results/Findings: The data received from implementing the multisensory approach were analyzed using the Statistical Package for the Social Sciences (SPSS) software. There are three primary findings gathered from analysis of the data. The first primary finding shows that after participation in multisensory intervention, participants who saw an improvement in words per minute (WPM) showed an
average gain of 15%. The individual improvements in WPM scores ranged from a 1% gain to a 41% gain. The second primary finding was determined from the results of a frequency table. The frequency table illustrates that 61.5% of participants demonstrated an unintegrated ATNR during pretest scoring, while at posttest scoring, this decreased to 23.1% of participants.

Discussion/Conclusions: It has been concluded that intensive multisensory approach is effective at improving handwriting speed. Additionally, intensive intervention four days a week also may have contributed to overall speed improvements. The regular practice of motor patterns was helpful in integrating persistent primitive reflexes in the participants. The strengths of this study were that there was a consistent primary investigator delivering handwriting intervention, and that it was an intensive three week program that promoted carry-over of skills. The limitations of this study were that there was a small sample size, a wide age range, and varying performance skill sets among participants.


Authors: Shana Cerny, Jenna Alswager, and Nicole Sowards – Occupational Therapy
Faculty Advisor: Shana Cerny

4. Hypnosis in Healthcare
Summary: Hypnosis is a non-invasive technique that could be considered an alternative to medication in some healthcare situations.

Purpose: Hypnosis is a non-invasive technique that could be considered an alternative to medication in some healthcare situations. The purpose of the systematic review of the literature was to obtain information about the how hypnosis could be used advantageously for a patient in a variety of health-related situations.

Methods: A systematic review of the literature was conducted to evaluate the uses of hypnosis in health-related situations. The following databases were included in the review: CINAHL, PubMed, Cochrane Collaboration, DynaMed and Trip. Additional supportive information was obtained from professional, educational, or governmental websites.

Results/Findings: Several articles met the inclusion and exclusion criteria. Important topics presented throughout the research include the many advantages and disadvantages of hypnotherapy when used for health-related issues, the history of hypnosis is, methods and procedures to accomplish hypnosis, and how it could assist in the field of dentistry.

Discussion/Conclusions: The literature cites many advantages of hypnosis in the medical field. Examples are limited/no side effects, non-invasive nature of the procedure, and assistance with controlling saliva, fear, and gag reflexes. Hypnosis has been gaining
acceptance in the medical field, but lacks a sufficient amount of scientific research. Not all individuals are hypnosuggestable, and certainly not all health professionals are trained in this type of therapy. However, it may be beneficial to some people in certain situations.

Authors: Kelsey Stoltenburg, Courtney Tobin, and Denyelle Viereck – Dental Hygiene
Faculty Advisor: Ann Brunick

5. Electroconvulsive Therapy vs. Medical Marijuana

Summary: We researched the effects of electroconvulsive therapy on depression and the effects of medical marijuana on depression. We analyzed studies already done and compared the findings on electroconvulsive therapy with those on medical marijuana. We organized our research into an evidence based poster presentation.

Purpose: Major depression is a form of depression that interferes with daily activities such as sleeping, eating, working, and enjoying life. Statistics from Depression and Bipolar Support Alliance (2005), shows that major depressive disorder affects about 14.8 million American adults, specifically 6.7% of people 18 and older yearly. The purpose of this report was to research different treatments for depression and evaluate the most effective outcomes. Our goal was to answer this question: In young adults ages 18-24 with major depression, is electroconvulsive therapy or medical marijuana more effective in decreasing depression in patients over a time period of 4-6 weeks?

Methods: The evidence search method we used the databases ProQuest, PubMed, CINAHL Complete, and EBSCOMega File. Within these databases we used the following search terms: electroconvulsive therapy, medical marijuana, depression, suicide, and young adults. We restricted our research to within the last 10 years and scholarly journals.

Results/Findings: We looked at several studies and the results favored ECT over medical marijuana. One study showed that 55.3% of the patients receiving ECT achieved remission from depression and 65.8% responded to ECT treatment. It is effective, well tolerated, and only has minor side effects with no serious adverse effects. Although medical marijuana leads to a 10.8% reduction in suicide rates in states that legalized use, other studies revealed the harmful effects marijuana has on the body and that use is associated with increased risk for depression.

Discussion/Conclusions: In conclusion, ECT is shown to be more effective in treating major depression compared with medical marijuana.

The Shocking Reality of Anaphylaxis Management

Summary: Anaphylaxis is a life-threatening medical emergency with an immediate reaction and release of histamine that leads to edema, asthma, and airway constriction with at least two organ systems involved.

Purpose: Anaphylaxis is a life-threatening medical emergency with an immediate reaction and release of histamine that leads to edema, asthma, and airway constriction with at least two organ systems involved. The purpose of this systematic review of the literature is to obtain information regarding the impact of the misdiagnosis and delayed response for treatment of anaphylaxis.

Methods: A systematic review of the literature was conducted regarding the misdiagnosis and delayed response for treatment of anaphylaxis. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

Results/Findings: Several articles met the inclusion and exclusion of criteria. The important topics presented throughout the research include the fact that professionals feel inadequate to treat anaphylaxis, how patients with anaphylaxis delay seeking treatment, and how injectable epinephrine is misused.

Discussion/Conclusions: Frontline emergency professionals have recognized the large number of cases in which anaphylaxis diagnosis and treatment failed. The evidence concludes that 80% of anaphylaxis treatment did not include epinephrine. In addition, failed anaphylaxis management was connected to the lack of clinical recognition. Rapid progression of this reaction necessitates the administration of epinephrine immediately and research indicates medical and dental professionals feel inadequate to deliver epinephrine promptly. Another area of concern is that patients fail to use auto-injectors correctly, which leads to misuse.

Authors: Marcus Becks, Holly Canada, Kellee Griese, and Abby Heath – Dental Hygiene
Faculty Advisor: Ann Brunick
7. **Environmental Factors Influencing the Development of Food Allergy**

**Summary:** Food allergies have become an increasing problem throughout the world, especially in the United States. Current research has been studying whether an environmental influence may be linked to the recent increase in prevalence. The present analysis focuses on the roles that gut microbiota, vitamin D, and mode of delivery may play in the development of food allergies.

**Purpose:** The purpose of this research is to determine the roles that gut microbiota, vitamin D, and mode of delivery may play in the development of food allergies.

**Methods:** Articles reviewed for this analysis were found using the University of South Dakota's Library Research Gateway. Through this site, several research databases were accessed.

**Results/Findings:** Most of the articles reviewed for each topic demonstrate an increased risk in developing food allergies. However, few articles are able to show a significant increased risk.

**Discussion/Conclusions:** Overall, the research on these topics is too sparse to draw any strong conclusions. However, gut microbiota may be the most promising. Quality research may be limited by the complexity and variability of food allergies making any true correlation difficult to define.

**References:**


*Author: Stacy Danielson – Physician Assistant Studies  
Faculty Advisor: William Schweinle*

8. **The Practice of Betel Quid and Areca Nut Use**

**Summary:** Betel quid with chewing tobacco has been associated with many negative health effects.

**Purpose:** Betel quid with chewing tobacco has been associated with many negative health effects. Tooth discoloration, periodontal disease, oral leukoplakia, submucous fibrosis, and squamous cell carcinoma have been reported. Many healthcare providers may be
unaware of the quid habit in some populations as a social and/or religious practice. It is important that the dental practitioner recognizes oral manifestations that could lead to significant health problems.

**Methods:** A systematic review of the literature was conducted regarding the effects of betel leaf use. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include how chewing tobacco is significantly associated with an increased risk of oral cancer, betel quid without tobacco may have an independent positive association with oral cancer due to the carcinogenicity of areca nut, smokeless tobacco and betel leaf users have limited awareness of its association with oral cancer, and information about cessation of the practice.

**Discussion/Conclusions:** Betel use typically includes areca nut and tobacco wrapped in a betel leaf with slaked lime. The practice is common in Asia and East India. The recognition of associated oral mucosal lesions that could be malignant is important to the dental professional. Healthcare providers should be informed about these practices in order to educate patients about associated health risks.

Authors: Kylie Wattier, Nicole Springman, and Amanda Roemen-Madland – Dental Hygiene
Faculty Advisor: Ann Brunick

9. **Implications of Formulary Implementation and Their Impact on Patient Care and Outcomes**

**Summary:** This literature review focuses on the recent research to help determine how implementation of drug formulary plans may impact patient outcomes long-term. Due to the fact that formularies are a relatively new phenomenon, limited studies were available to demonstrate reliable, durable results. Further research is needed before any conclusions can be reached, but patients generally had more negative than positive outcomes according to the available studies.

**Purpose:** The purpose of this project was to determine how implementation of a formulary management plan (often used to decrease cost) would impact patient outcomes on a long-term basis.

**Methods:** Various medical databases including Cinahl and Medline were searched with terms including "prescription formulary outcomes", "managed care outcomes", "formulary patient outcomes", and "effects of formulary management". Studies within the last twenty years that focused on patient outcomes were included in this review as well as some studies with rather specific foci, to be used as examples of the variety of patient outcome measures.
**Results/Findings:** The use of prescription formularies is on the rise even in non-managed settings. (Fang et al., 2009) There is no standardized procedure or method for formulary decision making. (Schiff et al., 2012) Much of the costs saved by the formulary benefit manager is passed to the consumer. (Huskamp et al., 2003) Formulary implementation decreases overall drug spending, but increases patient out-of-pocket spending. (Landon et al., 2007) Increasing copayments leads to a reduction in the use of essential drug classes, and may take patients form managed to unmanaged disease states, thereby increasing the over all cost of healthcare. (Goldman et al., 2004) “While some data exist demonstrating that effective formularies can restrain costs, there are few high-quality studies demonstrating the ways formularies can actually improve clinical outcomes.” (Schiff et al., 2012)

**Discussion/Conclusions:** Formulary benefit plan implementation has a short-term focus. They are often implemented as a means of cost control and fail to take into consideration the potential for negative patient outcomes. Long-term research of formulary effectiveness should have been preformed and repeated before the widespread implementation of these plans. As well, a method for standardization of these plans is also necessary. This specific review demonstrated more empirically negative effects on patient outcomes than positive.


*Author: Jacqueline Evernham – Physician Assistant Studies*  
*Faculty Advisor: William Schweinle*

10. **Entamoeba gingivalis**

**Summary:** This project will aim to provide information on Entamoeba gingivalis. Our presentation will include treatment, prevention, and means of infection. Comparisons will also be made between E. histolytica and E. gingivalis.

**Purpose:** This presentation will provide an overview of Entamoeba gingivalis, the current methods of treatments and preventions, means of infection, and the comparison of E. gingivalis and E. histolytica.

**Methods:** Diagnosis involves light microscopy, mouth scrapings, sputum, and tonsillar material to identify the parasite as gingivalis. Most often E. gingivalis is difficult to distinguish from E. histolytica. As for treatments and preventative measures, it is said that treatment of
associated bacterial infection with antibiotic might be enough for the infection (Jian, et al., 2008). Attention to oral hygiene and the proper care of the teeth and gums may prevent the spread of oral E. gingivalis infections (Clinical Parasitology, 2012).

**Results/Findings:** This entamoeba is associated with periodontal disease in immunocompromised individuals, perhaps increasing vaginal discharge and playing an epidemiological role in the oral transmission of the HIV virus.

**Discussion/Conclusions:** Entamoeba gingivalis is a protozoan endoparasite, residing in the tartar and pus pockets of teeth of pyorrhea infected human beings and being present in tonsil crypts and tonsil tissue sections in some instances (Pujari, n.d.).


Authors: Grace Bode, Kody Jakopak, and Hanying Yu – Medical Laboratory Science
Faculty Advisor: Kay Rasmussen

11. **Protection by Detection: HIV Testing in the Dental Setting**

**Summary:** HIV/AIDS continues to be a health concern to individuals and healthcare providers.

**Purpose:** HIV/AIDS continues to be a health concern to individuals and healthcare providers. Screening for HIV in the dental setting is a service that is being implemented in various clinics throughout the nation. The purpose of this systematic review of the literature is to inform dental professionals of the advantages, barriers, technique, and costs of providing this service.

**Methods:** A systematic review of the literature was conducted regarding the aspects of HIV testing in the dental setting. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include the prevalence of the disease, the oral manifestations, and opportunities and concerns regarding this type of testing in the dental office.

**Discussion/Conclusions:** The first signs of HIV often present in the oral cavity. The most common oral manifestations of this disease include oropharyngeal candidiasis, herpes simplex virus lesions, and oral hairy leukoplakia. These signs are all easily identifiable by oral healthcare providers, which provides a natural segway for HIV testing in the dental office. Procedures are quickly completed within
twenty seconds and can be read within fifteen minutes. The goal of implementing testing in the dental setting is to offer protection by detection and assist in lowering the incidence of HIV/AIDS in the nation.

Authors: Rebecca Cavin, Blake Seier, and Hollie Zwart – Dental Hygiene
Faculty Advisor: Ann Brunick

12. Surgical Treatments for Sacrococcygeal Pilonidal Disease: Determining the Best Technique

Summary: A poster presentation regarding surgical treatments and outcomes of sacrococcygeal pilonidal disease. This poster will assess post-operative infection, wound dehiscence, and disease recurrence rates of various surgical options.

Purpose: The focus of this literature review is to examine popular surgical treatments in order to determine the one that provides sacrococcygeal pilonidal disease patients with the best long-term outcomes.

Methods: Current literature detailing surgical techniques including Limberg flap, modified Bascom technique, modified Dufourmentel approach, and S-plasty, were reviewed in order to identify the surgical treatment technique associated with the best long-term outcomes as measured by post-operative infection, wound dehiscence, and disease recurrence rates. The review was conducted from September to November of 2013. PubMed and EBSCOHOST databases were utilized to locate the articles utilized. "Pilonidal sinus," "pilonidal disease," "pilonidal sinus surgery," "pilonidal sinus treatment," and "sacrococcygeal pilonidal sinus" were used as search terms, and resulted in nearly 5,000 articles.

Results/Findings: Results were not indicative of a single superior technique as measured by post-operative infection, wound dehiscence, and disease recurrence rates. However, the inclusion criteria of each study varied, making it difficult to compare outcomes of the studies.

Discussion/Conclusions: Although the results did not clearly identify a superior technique, they did further accentuate the need for additional studies detailing treatments for sacrococcygeal pilonidal disease. Keywords: pilonidal disease, sacrococcygeal sinus.

Parental Involvement in Pediatric Peri-Operative Experience

Summary: Recovery from anesthesia in the pediatric population sometimes causes inconsolable crying and cyanosis. Parents are usually in the waiting room until the Registered Nurse retrieves them on the way to the step-down unit. It is suggested that the more involved the parent(s) is in the peri-operative process, the less anxious the child is postoperatively. Increasing parental involvement could be as simple as a hospital tour, brochures, or changing protocol to allow parent(s) in pediatric post anesthesia care unit.

Purpose: The purpose of this project was to search for evidence to provide a less traumatic perioperative experience for the pediatric outpatient and their parent. Our goal was to answer the question: In pediatric outpatient perioperative patients (aged 2 - 6 years), how does play therapy with the RN compared to the parent's presence throughout the entire perioperative experience affect inconsolable crying, cyanosis, and parent's perception of RN care from the time of check in through the first hour of postoperative care?

Methods: We reviewed several studies on how education and role playing reduced anxiety in the perioperative arena.

Results/Findings: Two studies encouraged continued role playing by the RN, and three studies encouraged more parental involvement to reduced anxiety for both the patient and parent. The results suggested that the more involved the parent; the better the experience for both parent and pediatric patient.

Discussion/Conclusions: After reviewing the literature, we concluded that for a pediatric outpatient surgical patient (aged 2 to 6 years), parental involvement can be just as effective as an RN who does play therapy in reducing anxiety in the patient and parent.


**Summary:** Medicine is evolving its methods to provide individualized care, which includes patients with acute respiratory distress syndrome (ARDS) being mechanically ventilated. As early as 1964, Milic-Emili and colleagues explain that pressure measurements from the esophagus may reflect pleural pressure or perhaps a close estimate. This would allow practitioners to set PEEP with consideration of lung compliance and the outside forces placed on the lung. According to Loring and colleagues (2009) the measurements are not accurate and should not be trusted in patients with acute respiratory distress. Although only estimates, perhaps these measurements provide valuable information that may improve patient outcomes (Sarge et al., 2009). The studies reviewed here did not suggest improved survival, but factors that contribute to survival (oxygenation, compliance) and were improved.

**Purpose:** In order to reduce the stress associated with opening and closing of alveoli, it is important to determine an "optimal PEEP level" (Mols, G. et al, 2005). Patients with ARDS have transpulmonary pressure that is negative at end expiration, which indicates the closure of distal airways and therefore the patient develops atelectasis (Talmor et al., 2010). By increasing the set PEEP, there will subsequently be an increase in transpulmonary pressure, secondarily to opening of the distal airways (Sarge et al., 2009). An additional consideration for the use of esophageal balloon measurements is that it offers information about the variations in transpulmonary pressure between critically ill patients (Mols et al., 2006). This allows clinicians to tailor treatment of PEEP specifically to each patient. The primary purpose of the present paper is to look at the advantages and disadvantages of using esophageal balloon measurements and to determine if its use is appropriate in ARDS patients. Esophageal balloon measurements, despite being estimates, could be used to treat patients individually and improve outcomes. Sarge et al. (2009) argue for the utility of imperfect measurements. The studies in this literature review include the "optimal PEEP setting" and its effect on oxygenation, compliance, and patient outcomes when determined by esophageal balloon measurements.

**Methods:** The research database solely used was PubMed. The search included the following keywords: Transpulmonary pressure, ARDS, optimal PEEP, esophageal balloon, atelectrauma. Data sources include randomized control trials and meta-analyses. Data sources were assessed for information including use of and esophageal balloon and its impact on PEEP setting, oxygenation, compliance, and mortality and clinical outcomes. Only articles written in English were used.

**Results/Findings:** Compared PEEP levels in Patients with ARDS Study by Talmor and colleagues (2008) Treatment Method PEEP Setting Conventional Method (n=31) 12+/5 cmH2O Esophageal Balloon (n=29) 18+/5 cmH2O p-Value = < .001 Cohen’s d 5 + 5 / 2 = 5 - 18 - 12 / 5 = 1.2 Rodriguez et al., (2013) looked at PEEP titration and found more rapid weaning Comparison of PAO2/FiO2 ratios in patients with ARDS Study by Talmor and colleagues (2008) PEEP levels set based on Esophageal Balloon measurements Treatment Methods PAO2/FiO2 Ratio Conventional Methods (n=29) 191 +/- 71 Esophageal Balloon (n=29) 280 +/- 126 p-Value = .002 Cohen’s d 126 + 71 / 2 = 98.5 - 280 - 191 / 98.5 = .9 Measured Compliance in Patients with ARDS with H1N1 Study by Talmor and colleagues (2008) Treatment Method Mean Compliance Conventional Method (n=29) 35 +/- 9 ml/cmH2O Esophageal Balloon (n=29)
45 +/- 14 ml/cmH2O  p- Value = .005 Cohen’s d  14 + 9 / 2 = 11.5 -> 45 -35 / 11.5 = .87  28-day Mortality  Study by Pintado and colleagues (2013)  Treatment Methods  Conventional Methods (n=34) 38.9%  Esophageal Balloon (n=36) 20.6%  p-value = .12  28-day and 180-day mortality  Study by Talmor and colleagues (2008) failed to show clinical significance  Outcome  Esophageal Balloon (N=30)  Conventional Treatment (N=31) 28-day mortality 5 (17)  12 (39) No. (%)  180-day mortality 8 (27) 12(45) No. (%)  p-value of .055.

**Discussion/Conclusions:** Conventional methods used may be reasonable for a general population that receives mechanical ventilation, but there is variability in the critical ill (Soroksky, Esquinas, 2012). Tailoring treatment with the use of an esophageal balloon pressure transducer have demonstrated improvement in oxygenation, compliance, and increased number of ventilator free days by using transpulmonary pressure as a guide in setting PEEP. Unfortunately, many of these studies fail to show statistical significance in survival. Additionally, there were a limited number of studies that focused primarily on survival. The most critical finding in this research was the lack of significance for overall mortality and survival. The results by Talmor and Pintado reveal patients being treated with an esophageal balloon may have a better chance of survival even though it was not demonstrated statically, and possibly is reflected by a small sample size. Talmor and colleagues (2008) and Grasso and colleagues (2011) In conclusion, adjusting PEEP based on transpulmonary pressure has demonstrated improvement in oxygenation and compliance, but significance in survival is yet to be seen. The conventional approach to setting PEEP (ARDSnet tables) may not be sufficient in patients with ARDS. Individualized ventilator settings in addition to individualized care are favored approaches in medicine. Finally, the literature reviewed concludes that there may be clinical benefit to measuring esophageal pressure, but further research is indicated.

Weight Loss Interventions in Individuals with a BMI Greater Than 30

Summary: This project aimed to find the effectiveness of weight loss through diet, exercise, or a combination of both. The end result from our research found that diet and exercise alone have very similar effects, therefore an incorporation of both would be most effective.

Purpose: In the middle aged population with a BMI greater than 30, how does a reduced calorie diet compared with an exercise program that includes aerobic and anaerobic activities effect achieving a 5 pounds (2 kilograms) weight loss within 6 months?
**Methods:** Search Databases: 1. PubMed  2. CINAHL  3. EBSCO Host  4. Cochrane Library  

**Results/Findings:** Out of the five studies we used, three support our intervention, one of them supports our comparison, and one supports both our intervention and comparison.

**Discussion/Conclusions:** Diet and exercise have very similar results in achieving weight loss, therefore, obese middle-aged adults should incorporate a combination of both in their weight loss intervention. With the exception of one, all of the studies we found were done on healthy obese adults. Therefore, there is a need for a study on exercise and diet in obese people with diabetes and cardiovascular health problems. We also recommend goals be set with the next update of the Healthy People guidelines.


Authors: *Helena Bertels, Kaila Nelson, and Tefera Negash - Nursing*
Faculty Advisor: *Jo Ann Kim*

16. **Coronary Heart Disease: United States vs. United Kingdom**

**Summary:** My presentation will compare and contrast the United States and the United kingdom and how they prevent and control coronary heart disease within the country.

**Purpose:** To compare and contrast a global health issue within two alike countries. Also to describe the priority steps that could be taken to address the health issue and to determine the rationale for those recommendations.

**Methods:** I used research articles and global health websites, such as the Centers for Disease Control and Prevention and The World Factbook, to gather information regarding the economic status of the United States and United Kingdom as well as the status of coronary heart disease within each country.

**Results/Findings:** Coronary heart disease is being prevented and controlled relatively similar in the United States and the United Kingdom. Both countries are struggling to change the lifestyles of their coronary heart disease patients. Improving patient education regarding healthier lifestyles is something the United States and the United Kingdom are striving towards.
Discussion/Conclusions: In order to prevent the development of coronary heart disease, the affected populations are going to have to start living healthier lifestyles. Eating a healthier diet, maintaining a healthy weight, exercising regularly, abstaining from smoking and limiting alcohol use are all lifestyle and behavioral choices that can prevent the development of coronary heart disease.

Author: Brianna Davis – Health Sciences
Faculty Advisor: Becky Wolff

17. Ross Procedure Verses Mechanical Valves

Summary: Ineffective aortic valves contribute to lack of circulating oxygen in the body. Non-patent valves contribute to shortness of breath and decreases pediatric patient's quality of life. When using biological cardiac valves instead of mechanical valves there is a longer period for the valves to stay in the body before needing replacement. This in turn creates a valve that will grow with the pediatric patient and doesn't require anti-coagulation therapy for life. (Alsoufi, 2013).

Purpose: Pediatrics with ineffective aortic valves are faced with a dilemma. Should they request a mechanical valve or the Ross procedure for replacement? The purpose of this report was to research the most effective option for a developing child. Our goal was to answer this question: In pediatric patients with ineffective aortic valves, how do mechanical valves compare with biological valves replaced by the Ross procedure, influence a growing patient's overall quality of life and longer utilization inside the heart over the length of ten years. Several studies researched how adequate aortic valve replacement surgeries were in children. The results suggested mechanical valve lasts longer, but the patient will require an aortic valve replacement once they outgrow the first valve and requires anticoagulant medications, venipunctures, and restrictions on physical activities. In contrast, the Ross procedure had a built in growth factor and no need for anticoagulation therapy, leading to an increase quality of life. This is especially important for a child because safe anticoagulation therapy requires that the child not play active sports due to bleed and bruising if injured. In conclusion, we recommend that the Ross procedure be used for a pediatric patient who needs an aortic valve replaced.


Results/Findings: Both Ross and mechanical valves have benefits and drawbacks. Two articles show evidence that the Ross procedure has a higher survival rate in children than the use of mechanical valves. As a counter point, one article states that mechanical valves have a longer durability as long as the valve is the correct size and is accepted by the body. The major draw back of mechanical valves is that they do not grow with the child's artery. One hazard reported in three articles stated patients with mechanical valves must be on life-
long anticoagulation therapy. Drug compliance with anticoagulants reduces quality of life for the child because it restraints activity level. The Ross procedure does not need anticoagulation therapy.

**Discussion/Conclusions:** As a group, the evidence leads us to believe that the Ross procedure is a more suitable option for pediatric patients. When compared to mechanical valve replacement, the advantages of the Ross procedure are increased quality of life, eliminating the need for life-long anticoagulants therapy, and the valve has a growth factor equal to that of the patient. For future research, our group suggest an increase in locations, to allow more predictions on how the Ross effects long term and to have more complete echocardiographic data for each patient.


**Authors:** Nicole Doerr and Shawn Christoffers - Nursing

**Faculty Advisor:** Jo Ann Kim

**Does Cold-Induced Hypothermia Provide Positive Results in the Recovery of a Spinal Cord Injury?**

**Summary:** This project was to research the effects and benefits of cold-induced hypothermia following a spinal cord injury. Both animal and human research has shown some positive results in improving patients' recovery and functioning. However, more research is needed in order to deem cold-induced hypothermia a means for treatment for a patient who sustains a spinal cord injury.

**Purpose:** The objective of the present paper was to research cold-induced hypothermia and its effect it has on the body. This review explored whether the use of systemic hypothermia following spinal cord injury could improve the quality of life of a patient.

**Methods:** Information about spinal cord injuries were researched using websites such as: Mayo Clinic and Centers for Disease Control and Prevention. After developing a good understanding of the topic, medical databases, e.g. PubMed, ScienceDirect, & CINAHL were queried. Human and animal studies about systemic hypothermia used in spinal cord injuries were used in the present paper.

**Results/Findings:** Results showed that there are some positive outcomes with the use of hypothermia. Most of the animal studies used BBB scores to determine locomotor abilities. Some showed a statistical difference in use of hypothermia, and some just showed a slight difference. Bladder control, forearm strength, and upper limb strength were other measures that were tested. In human research, there was found to be no statistical difference in the side effects associated with hypothermia compared to normothermia. Levi et al. (2010)
found that hypothermic patients had less blood loss and more patients increased a grade or more. More research is needed in order to deem cold-induced hypothermia a means for treatment for a patient who sustains a spinal cord injury.

**Discussion/Conclusions:** There are a lot of factors still to be determined, and thus more research is needed to fully conclude that cold induced hypothermia should be included in the treatment following a spinal cord injury. The lack of randomization, small sample sizes, and confounding treatments and location of injury has lacked the statistical power to deem cold induced hypothermia as an intervention for wide spread use. A multicenter, randomized study would be needed to determine if systemic hypothermia should be a treatment intervention for patients who have sustained a spinal cord injury.

**References:**

**Author:** Chet McManus – Physician Assistant Studies  
**Faculty Advisor:** William Schweinle

19. **The Use of Copper to Reduce Hospital Acquired Infections: A Literature Review**

**Summary:** Hospital acquired infection pose a major risk to patients in terms of mortality and morbidity, and major efforts are taken every day to limit or prevent such infections. Replacing high touch surfaces like table tops, door knobs, bed rails, and toilet seats with copper, which is naturally antimicrobial, we may be able to limit the number of hospital acquired infections. A literature review was completed with multiple studies showing copper's effectiveness to harbor less microbes in a health care setting compared to stainless steel or plastic. More research needs to be done to determine if this would translate to fewer infections.

**Purpose:** Hospital acquired infections pose great risk to patients and the dollars spent preventing, treating, and reimbursing for them are significant. This paper looks at current literature to determine if using copper surfaces in a health care setting can decrease the pathogen load on touch surfaces and thus decrease nosocomial infections. Although there is an abundance of evidence showing copper as an antimicrobial substance, not many studies have examined how copper would impact an actual hospital floor unit, and if using copper would lead to a decrease in the numbers of hospital acquired infections.
Methods: A Pubmed database search was conducted using the terms "copper + antimicrobial", "copper surfaces", "nosocomial infections + copper", "MRSA + copper", and "hospital acquired infections". Twenty-four sources were found that matched the scope and intent of this paper and have been used in completion of the paper. Copper implants have been proposed as a way of reducing postsurgical site infections, but this literature was beyond the scope of the present review.

Results/Findings: Several studies showed that replacing common touch surfaces (e.g. bed rails, toilet seats, table tops, door knobs, and push plates) with copper, in a hospital setting, reduced the number of colony forming units on those surfaces when compared to the standard surfaces like stainless steel, wood, or plastic.

Discussion/Conclusions: The findings of this review support using copper in a hospital setting to decrease pathogens likely to cause nosocomial infections. More research needs to be done to determine if this decreased microbial load of high touch surfaces will result in decreased nosocomial infection rates.


Author: Marc Tobin – Physician Assistant Studies
Faculty Advisor: William Schweinle

Minimizing Hospital Acquired Infections (HAI) with Improved Oral Hygiene

Summary: Hospital-acquired infections develop while people receive treatment for another condition in a healthcare setting.

Purpose: Hospital-acquired infections develop while people receive treatment for another condition in a healthcare setting. The purpose of this systematic review of the literature is to obtain information regarding hospital-acquired infections and determine the impact that poor oral hygiene has on their incidence and prevalence. Hospital-acquired infections can cost thousands of dollars each additional day a patient has to stay in the intensive care unit. It is proposed that by incorporating the services of a dental professional such as a dental hygienist into this setting, the incidence and prevalence of HAIs may be reduced.

Methods: A systematic review of the literature was conducted regarding hospital acquired infections. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were
used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include the background information of hospital acquired infections, the impact they have on oral hygiene, and how dental hygienists can impact the reduction of hospital-acquired infections.

**Discussion/Conclusions:** Hospital-acquired infections often occur when patients are intubated. The most common types of infections include pneumonia and respiratory tract infections. Current practice is to periodically swab the oral cavity with chlorhexidine. Active clinical trials designed to measure whether the decrease in the number of pathogenic oral microbes through the use of a dental professional in this setting are encouraging. Reducing costs, decreasing length of a patient's hospital stay, and promoting health is a primary goal in any healthcare setting.

Authors: *Paige Hoffmeyer, Carley Huisenga, and Morgan Hebig – Dental Hygiene*
Faculty Advisor: *Ann Brunick*

21. **The Ever-Changing Influenza**

**Summary:** Influenza is an evolving disease that has become more than just the "annual flu bug".

**Purpose:** Influenza is an evolving disease that has become more than just the "annual flu bug". This disease is concerning to people of all ages. Although influenza gained great worldwide awareness during the pandemic of 1918, it has been the cause of great concern because of the inability to predict the strain(s) for which to create the annual vaccine. The purpose of the systematic review of the literature is to obtain information in order to inform healthcare providers about the evolution and severity of this common disease.

**Methods:** A systematic review of the literature was conducted regarding the effects of influenza. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include the history of the disease, how it has changed, how it manifests, and how it is controlled.
Discussion/Conclusions: The many different strains of this disease continue to evolve and become more difficult to predict. Vaccines continue to be recommended on an annual basis, even though they may not protect against the many strains. Continued research is necessary in order to provide the best protection against this very old, yet significant disease.

Authors: Carla Langerock, Kate Kaster, and Mariah McFarland – Dental Hygiene
Faculty Advisor: Ann Brunick

22. Trypanosoma cruzi

Summary: This presentation will cover the epidemiology of T. cruzi by the Reduviid bug vector in Southern United States, and in South and Central America; its diagnosis which is through the presence of trypomastigotes in human blood, treatment which involve anti-parasitic drugs as specified by CDC or healthcare providers, and prevention which involve the use of insect repellants, and proper housing structures in endemic areas like South and Central America.

Purpose: To educate the public on the health risk caused by Trypanosoma cruzi in the American continent particularly the Southern part of the United States, South and Central America.

Methods: Statistical data, and graphs.

Results/Findings: About 8 million people are known to have been infected in Mexico, South America, and Central America; an estimate of more than 300,000 infected people are known to live in the United States.

Discussion/Conclusions: Trypanosoma cruzi is not only spread from the reduviid bug vector but can also be spread from person to person through blood transfusion. Thus screening for blood donation together with other preventive measures like the use of insect repellants, and proper housing structures in endemic areas will further decrease or eradicate the spread of the parasite.


Authors: Stephen Ashu, Nicole Arbach, and Caleb Epp – Medical Laboratory Science
Faculty Advisor: Kay Rasmussen
23. **Parasitic Testing and Diagnosis**

**Summary:** Our research presentation shows the methods of testing and diagnosing parasitic infections in patients. It discusses the tests that currently and are being used and ones that could be beneficial in the future. Our research is also aimed at educating about the presence of parasites all around the world, including the United States.

**Purpose:** In the United States, the majority of the population has often overlooked parasites. It is important for the general population to be informed about parasitic infections. Parasites are all around us and contrary to popular belief, parasites can be found in any climate and region of the world. Traditionally, there have been misconceptions about the transmission of parasites and where they can be found. Having the ability to effectively diagnose parasites is beneficial to our health. Our research will provide information about the various testing methods used to diagnose people suffering from parasitic infections.

**Methods:** The main focus of our research is to discuss the three major methods used to diagnose and treat parasitic infections. We will explain in detail how ova and parasite, serological, and microscopic methods are used to classify the various types of parasites that can be found in the blood, stool, tissue, and cerebral spinal fluid.

**Results/Findings:** We will discuss the recommended standard collection techniques in conjunction with proper testing methods. We will compare the past and present procedures used to diagnose a patient suffering from parasitic infections.

**Discussion/Conclusions:** Additionally, we will discuss the future methods that scientists are considering to help identify the parasitic infections. Advances in technology and the development of better testing techniques will allow scientists to identify parasites and analyze their physical structures with more accuracy. Our research will provide information on how parasites have affected humans throughout history. This presentation will provide an insight into collection protocols, testing methods, diagnosis, and the development of future test methodology.

Authors: Wes Bonham, Maggi Caoleman, Elena Alonso, and Carmelita Shouldis — *Medical Laboratory Science*
Faculty Advisor: Kay Rasmussen

24. **Vaping: The New Face of Cigarettes**

**Summary:** The electronic cigarette industry is a rising empire to which consumers are now turning.

**Purpose:** The electronic cigarette industry is a rising empire to which consumers are now turning. This societal change is partially the result of a marketing campaign that appeals to all ages promoting the product to be "safer" than the traditional cigarette. However, the effects of electronic cigarettes are still being investigated. The purpose of this systematic review is to obtain information regarding the health effects of electronic cigarettes in order to inform healthcare providers of the issues surrounding their use.
**Methods:** A systematic review of the literature was conducted regarding the effects of electronic cigarettes. The following databases were included in the review: PubMed, CINAHL, and Medline Plus. Articles published in peer-reviewed journals were used to include systematic reviews, literature reviews, meta-analyses, RCT, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics presented throughout the research include marketing of e-cigarettes, why people are switching from cigarettes to e-cigarettes, and the adverse effects present in the use of these devices.

**Discussion/Conclusions:** There has not been enough research on the positive and negative effects of electronic cigarettes to determine an exact proposition on if they are a better alternative to traditional cigarettes.

Authors: Kelsey Kading, Angela Knapp, and Dana Kubal – Dental Hygiene
Faculty Advisor: Ann Brunick

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25. **The Challenge: Battle of the Drunk Goggles**

**Summary:** Our group designed a prevention program where college students will participate in an obstacle course that challenges their ability to function under the influence of alcohol. To simulate this effect, we will require the participants to wear "drunk goggles." The obstacle course will consist of lock and key, composing a coherent text message and tossing a ball from one participant to another.

**Purpose:** The purpose of this project is to raise awareness of the effects of alcohol on your body and reaction time and to also educate students on binge drinking.

**Methods:** Methods used during this project are educational handouts, the obstacle course that demonstrates reaction times and impaired coordination and the surveys we will conduct after completion of the obstacle course.

**Results/Findings:** Through the results of the surveys we conduct, we will know this at a later date.

**Discussion/Conclusions:** Research is in process.

**References:**

**Summary:** Our presentation will demonstrate how a family has its own unique progression through the disease of addiction and the recovery process. As an attempt to cope with the stress, family members progress through the adjustment, protective persona, and hopelessness stages of addiction. With appropriate intervention and support, abstinence, recovery, and healthy family relationships can be restored. Recovery is an ongoing process that includes three stages that the family may go through to restore healthy and working family relationships: early, middle and late recovery. Although a family may be in recovery, addiction is a disease and it is important to understand that it is common for the addict and the family to relapse.

**Purpose:** Approximately forty-three percent (seventy-six million) of the U.S. adult population and twenty-eight million (approximately one in four) children under eighteen have been exposed to an alcohol use disorder in the family. This presentation will provide an increased understanding of the processes behind the stages of addiction and recovery in a family system. The intended purpose is to increase the knowledge of healthcare professionals to effectively treat their patients and clients struggling with addiction and substance use. This information can benefit: those currently living in an addicted family system, healthcare professionals that can identify these traits among their patients to more quickly refer them to therapy, and friends and families of those suffering so they can better understand, deal with, and help their addicted loved one.

**Methods:** Students enrolled in the ADS 410 course synthesized the information gained through required readings and class interactions with a review of the literature of scholarly journal articles from the I.D. Weeks Library’s electronic databases (www.usd.edu/library). The following databases were used: Academic Research Premier, EBSCO MegaFILE, Education Research Complete (ERIC), Social Work Abstracts, PsycINFO, ProQuest, and MEDLINE. Information was also acquired from the following national organization: National Association of Children Alcoholics.

**Results/Findings:** The first stage of family addiction is adjustment. Changes in communication, trust, and processes occur. Anxiety increases as the addict is the focus. Next, defensiveness and the struggle to maintain control take shape as a protective persona develops. In the hopelessness stage, families lose a sense of normalcy and distance themselves in alternative families, negative attachments, or traumatic bonding. Positive communication is key. Families admit their powerlessness in early recovery. Responsibility and tolerance replace blame and defensiveness. This stage may take months or years to accomplish. As the family moves into middle recovery the family discusses past trauma to improve personal responsibility. Active listening increases understanding of the past. The final stage, late recovery, allows members to forgive, make active listening a habit, and give new shape to broken love. The future remains positive while understanding the power of addiction.
Discussion/Conclusions: With addiction impacting the lives of approximately forty-three percent (seventy-six million) of the U.S. adult population and twenty-eight million (approximately one in four) children under eighteen it is discernable that healthcare professionals will encounter individuals and families struggling with substance use disorders and the subsequent consequences within their practices. Because families often turn to their healthcare provider to initiate help, increasing the competency of healthcare professionals enhances their effectiveness in identifying, approaching, and referring addicts and family members to treatment and therapy. It is not sufficient to only focus on getting the addict sober. Addiction is a family disease that affects everyone in the family system, and therefore every member of the family will have interpersonal, intrapersonal, psychological, and behavioral consequences that need treatment and/or therapy.


Authors: Jennifer Calvert, Courtney Balliet, Shana Boger, Gretchen McLaughlin, and Ashley Blanchard – Addiction Studies
Faculty Advisor: Mary Merrigan

27. Mario Kart: If You Booze Then Cruise, Will You Lose?
Summary: Our group designed a prevention program where college students will participate in driving simulation through the use of Mario Kart that challenges their ability to drive under the influence of alcohol. To simulate this effect, we will require the participants to wear “drunk goggles”. The driving simulation game will consist of multiple “races” allowing participants to experience driving sober versus under the influence of different goggles representing different blood alcohol levels.

Purpose: The purpose of this project is to raise awareness of the effects of alcohol on your driving abilities, reaction time, and overall functioning and to also inform students on the reality of the drinking patterns on campus.

Methods: Methods used during this project are educational handouts, the Wii console representing a driving simulator that demonstrates impaired driving, and the surveys we will conduct after completion of the driving simulation game.

Results/Findings: Through the results of the surveys we conduct, we will know this at a later date.

Discussion/Conclusions: This will also be discussed and determined at a later date.
Faculty Attitudes Toward Addressing Mental Health Conditions and Substance Abuse Among College Students

Summary: This study examined faculty perceptions of their knowledge in identification and attitudes toward approaching and referring students experiencing mental health (MH) conditions and/or substance abuse (SA) to appropriate services. The majority of the faculty perceived they are knowledgeable in identifying MH conditions and/or SA among students. Up to 91.0% of faculty respondents agreeing they can play a significant role, see themselves as important contributors, and are willing to take on the responsibility of addressing MH conditions and/or SA among students. Faculty see themselves as capable, yet are willing to participate in professional development to increase their skills in identifying, approaching, and referring students to appropriate services. The faculty were of the attitude that a student with a mental illness or substance abuse problem should be allowed to stay on campus and can succeed in higher education.

Purpose: The purpose of this study was to determine faculty members' perceptions of their knowledge and attitudes toward identifying, approaching, and referring students with mental health conditions and substance abuse. This study also examined the differences that exist in perceptions of knowledge and attitudes among faculty based on faculty members' academic discipline and personal characteristics.

Methods: The population for the study was 339 full-time faculty members from the schools of Arts and Sciences, Business, Education, Fine Arts, Health Sciences, Medicine, Law, and Graduate programs at a Great Plains university. Data were collected from the faculty using a modified survey instrument developed by Marion Becker and colleagues at the Florida Mental Health Institute and the Office of Institutional Research and Planning located at the University of Florida utilizing a five-point Likert-type scale to examine faculty perceptions. To answer the research questions, the responses of the subjects were analyzed through SPSS version 21.0 using the calculations of means and standard deviations, t tests, and one-way analyses of variance (ANOVAs) with a post hoc Tukey's test (p < .05).

Results/Findings: The results of the study indicated a wide range of faculty attitudes and perceptions. Faculty (91.0%) agreed they can play a significant role in supporting students with mental health (MH) conditions and/or substance abuse (SA). Faculty (96.0%) also agreed that students can recover and be successful. Faculty's perceptions of their knowledge in identifying specific symptomatology were noteworthy yet, faculty were reluctant to directly approach a student and make a referral. Academic discipline strongly influenced faculty perceptions. Faculty in Medicine/Health Science with formal education on MH conditions and SA perceived themselves as more knowledgeable and comfortable than did faculty without formal education. With (67.0 %) of faculty respondents being willing to
participate, professional development can be tailored toward refining the skills of formally educated faculty and more comprehensively train faculty with less formal education.

**Discussion/Conclusions:** Faculty members recognize the prevalence and subsequent consequences of mental health (MH) conditions and/or substance abuse (SA) among young adults in higher education. Faculty members can play a significant role in helping students through identification, approaching, and appropriate referral. Faculty members are: 1. Willing to participate in addressing MH conditions and/or SA among students. 2. Supportive of students experiencing a MH condition and/or SA and believe they can recover and be academically successful. 3. Knowledgeable in identifying students experiencing MH conditions and SA. 4. A faculty member's discipline influences his or her perceptions. Faculty in Medicine/Health Sciences perceive themselves as more knowledgeable in identifying students experiencing MH conditions and SA than faculty in other disciplines. 5. Willing to participate in professional development to enhance their skills in approaching and referring students to appropriate services.


**Author:** Mary Merrigan – Addiction Studies

**Impact of Nursing Program Type and Delivery Method on Student Value Development**

**Summary:** The development of professional nursing values is fundamental to the ability of the nurse to deliver safe, high quality patient care. The purpose of this study was to determine if there were differences in the professional values among nursing students enrolled in different types of pre-licensure programs using different delivery methods. The study demonstrated nursing students identified the value of trust as most important and the value of activism as least important. The study identified a significant difference in the value placed on trust based on age. The study did not identify any significant differences in professional values based on program type or delivery method.

**Purpose:** In response to the escalating demand for access to advanced education by non-traditional students, many nursing programs are using distance technology to deliver education. Although research has demonstrated the positive impact baccalaureate prepared nurses have on the quality of patient care, there are conflicting findings regarding the relationship between advanced education and the
development of professional nursing values). Because internalization of the profession's standards for behavior are a critical component of the educational process, it is essential to understand the differences in professional nursing values based on advanced nursing education and the use of distance teaching methods. The purpose of this study was to determine if there were differences in professional values among nursing students enrolled in different type of pre-licensure programs using different delivery methods.

**Methods:** This was a non-experimental, survey design study. Participants were nursing students recruited from an Upper Midwest University and were enrolled in either an associate degree face-to-face or in a distance baccalaureate program. Participants were recruited in January 2014 and the study was conducted in January - February, 2014. The outcome measure of interest was professional nursing values. The Revised Nursing Professional Values Scale was used to determine the level of importance placed on the following values: caring, trust, professionalism, justice, and activism and if that differed based on the degree type and method of delivery. The values incorporated within this instrument correspond with the American Nurses Association Code of Ethics for Nurses.

**Results/Findings:** Overall, students reported high levels of professional nursing values. Nursing behaviors encompassed in the value of trust were perceived as most important while behaviors associated with the value of activism were perceived as least important. There was a significant difference (F (df = 3, 105) = 3.79, p = .013) between both programs related to the level of importance assigned to the value of trust based on age. Students age 34 and over placed a higher level of importance on trust than younger students, age 18 - 22.

**Discussion/Conclusions:** Nursing students place a high level of importance on each of the professional values incorporated within the American Nurses Association Code of Ethics. Nursing students place a higher level of importance on values that relate to direct patient care and a lower level of importance on values involving professional behaviors including participation in professional associations, research, and policy development. In addition, the age of the student may impact the level of importance nursing students place on professional nursing values.

Author: Lisa Feller – Nursing

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**30. Do Flavonoids, Consumed in Maternal Diet, Increase the Risk of Infant Leukemia?**

**Summary:** Literature review on the effect of consumption of flavonoids, in particular soy products, in the maternal diet and if there is a link to infant leukemia. Infant leukemia and therapy-related leukemia both have similar translocation areas hypothesizing a link to flavonoids and the role in the etiology of infant leukemia. Findings concluded that there may be a link with studies finding flavonoids cross and accumulate in the fetus and cause DNA transformations linked to infant leukemia. Further research will need to look at daily recommended amounts or safe amounts during pregnancy.

**Purpose:** Infant acute myeloid leukemia is a rare form of cancer that arises in the first twelve months of life and has a high mortality rate. Currently, the etiology is unknown other than it begins in utero. Infant acute myeloid leukemia has a signature translocation on its
MLL gene located on chromosome 11q23. Fortunately, therapy-related leukemia, onset from DNA topoisomerase II inhibitor drugs against primary cancer, has the same translocation on the same gene.

**Methods:** Articles in this review were obtained by using PubMed as the primary source for finding articles. Key terms used to find articles were "Infant Leukemia", "Therapy-related Leukemia", "DNA topoisomerase II inhibitor", "Flavonoids", and "Genistein". The articles containing information related to acute myeloid leukemia, DNA topoisomerase II inhibitors, and therapy-related leukemia were used.

**Results/Findings:** Rodent studies and case-control studies have looked at the consumption of DNA topoisomerase II inhibitors, like flavonoids, and identified that flavonoids induce the MLL translocation, providing a possible etiology to infant leukemia. Flavonoids are present in most foods (soy products) and are encouraged to be consumed as a large part of the diet, especially in reproductive women.

**Discussion/Conclusions:** With the new information emerging about the leukemogenesis effects of flavonoids and their ability to cross the placenta, one could argue that flavonoid consumption of pregnant women should be in moderation, due to the potent DNA topoisomerase II inhibitor effects on rapid proliferating cells and their potential to cause infant leukemia.

Author: Amber Evenson – Physician Assistant Studies
Faculty Advisor: William Schweinle

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31. **Cancer Trends in Individuals with Birth Defects**

**Summary:** Cancer rates among individuals with birth defects has been a topic of discussion for a number of years. Knowing what birth defects show increased association with cancer, may lead to decreases in time to diagnosis, improved treatment, and possibly better outcomes. In this literature review three prevalent birth defects were considered and their relationship to a cancer diagnosis was examined. These birth defects include; Cleft lip and/or palate, Down syndrome (DS), and Turner syndrome (TS).

**Purpose:** In this literature review, three prevalent birth defects were considered and their relationship to a cancer diagnosis was examined.

**Methods:** Data for this research was compiled through various literature searches, primarily through PubMed. Keywords used in searched included; birth defects and cancer, congenital verses non-congenital birth defects and cancer, and Down syndrome and cancer. From the literature reviewed, data was collected that was pertinent to the topic of interest.

**Results/Findings:** The results of this study found conflicting results with respect to clefting. Found that DS patients where at an increased risk for developing leukemia. However, the response to therapy was improved when compared to non-DS patients who
developed leukemia. Additionally, TS patients who presented with a particular genetic profile were at an increased risk for developing gonadal carcinoma.

**Discussion/Conclusions:** The overall findings in this review suggest that patients with certain malformations are diagnosed with more often compared to reference cohorts. This is something that clinicians should not ignore. Having such knowledge can be a vital tool for recognition of symptoms in patients that may have difficulty communication of complaints. Conversely, it is important to take into account the negative data, as it may provide answers to patients and families who have questions about disorders. Having knowledge of malformations that or may not correlate with particular cancers can help the practitioner with their differential diagnosis, while aiding in the direction of therapy, and counseling of the patient and family. In turn, this may ultimately improve patient care for individuals and their families who are already under substantial, physical and emotional stress.

Author: Bryant Wieking – Physician Assistant Studies  
Faculty Advisor: William Schweinle

32. **Reducing Cancer Screening Disparities Among American Indians in the Northern Plains: Identifying Correlates of Colorectal Cancer Screenings**

**Summary:** This presentation will report on a study of the colorectal cancer screening correlates for American Indians (AI) with a sample of 208 AIs aged 50 years or older. Research on colorectal cancer screening correlates among AIs is virtually absent, and the current study sought to address this gap in knowledge.

**Purpose:** The purpose of our study was to identify colorectal cancer (CRC) screening correlates for Northern Plains American Indians (AI) with a sample of 208 AIs aged 50 years or older. Our study uses the Anderson’s Behavioral model to examine the following factors related to receipt of CRC screening: (a) predisposing factors: age, education, marital status, and gender; (b) need factors: personal and family history of cancer; and (c) enabling factors: income, having a usual source of medical care, annual health check-up, awareness of CRC screening, knowledge of CRC screening, and self-efficacy of CRC.

**Methods:** We used a survey research design with convenience sampling to examine factors related to CRC screening behavior. Given the American Cancer Society guidelines target persons aged 50 years or older (American Cancer Society, 2014b), our study included 208 AIs of this age range. Participants' recruitment sources included multiple locations such as local AI churches, other religious organizations, senior housing facilities, senior centers, an annual Indian art market, and three powwows in a Midwestern state within the Northern Plains region. To measure CRC screening participation, respondents were asked in a yes/no question format whether they had ever had a colonoscopy. Predisposing factors were demographic characteristics, including age, education, gender, and marital status. The two following questions addressed the need variables: "has the doctor ever told you that you had a cancer of any kind?" and "have any of your family (parents, grandparents, siblings, or close relatives) ever had
Results/Findings: Hierarchical logistic regression identified the following correlates of receipt of CRC screening: (a) predisposing factors: older age; (b) need factors: having a personal history of cancer; and (c) enabling factors: having an annual health check-up, greater awareness of CRC screening, and greater self-efficacy of CRC.

Discussion/Conclusions: Many researchers recommend culturally appropriate screening and prevention strategies (Becker, Affonso, & Beard, 2006; Burhansstipanov, 2005), such as those who use culture key factor related to cancer treatment and prevention (Kagawa-Singer et al., 2010). For example, Becker et al. (2006) used talking circles to gain AIAN women’s perceptions of key issues surrounding cancer as a health issue. Moreover, knowledge, attitudes, and behaviors toward cancer screening can vary for Indigenous communities internationally, indicating a need for culturally appropriate cancer prevention programs (Kolahdooz et al., 2014). Just as the heterogeneity across AIAN tribes cannot be overstated, individuals vary on the degree they prefer traditional versus biomedical forms of treatment (Gone & Trimble, 2012); thus preventive and intervention strategies must be responsive and reflect this continuum of preferences.

Authors: Soonhee Roh; Jarod Giger – Social Work
Michael J. Lawler – School of Health Sciences
Lisa Newland – Human Development and Educational Psychology

Potential Barriers to Outpatient Mental Health Therapy Services Among Rural and Frontiers Adults

Summary: Little is known about rural and frontier mental health disparities as they relate to potential treatment barriers. Through use of an internet survey, we aim to explore potential treatment barriers experienced by adults who receive outpatient mental health therapy services in South Dakota, a rural and frontier state. Despite the ongoing nature of this program evaluation, we discuss challenges and lessons learned to date.

Purpose: Mental health treatment barriers have devastating effects on the lives of persons with a mental illness, including being denied basic living essentials. These barriers have been encountered by both urban and rural residents. Great attention has been paid to exploring potential mental health treatment barriers encountered by persons who reside in urban communities. But, little is known about these experiences for persons residing in a rural and frontier state. To address this knowledge gap, we aim to identify potential treatment barriers to outpatient mental health therapy services among adult consumers residing in South Dakota, a rural and frontier state.

Methods: We are collecting self-report data from adults who receive outpatient mental health therapy services from community mental health agencies (CMHAs; n = 6) throughout South Dakota. Adult consumers of these services were invited to complete an internet survey that include demographic items and an adapted version of the Barriers to Mental Health Services Scale-Revised (BMHSS-R).
Participants were asked to voluntarily complete the BMHSS-R via the internet and at their leisure. Participant enrollment and data collection is ongoing.

**Results/Findings:** Data collection has been ongoing for over five weeks. Preliminary results appear promising and feedback to date has been positive. However, particular aspects of the program evaluation resulted in a few interesting challenges. We found it difficult to: 1) establish enduring relationships with agencies far from the student researcher’s residence, 2) maintain communication with key stakeholders, and, 3) reach potential participants who have limited or no internet access. These challenges resulted in noteworthy lessons learned which provided us with vital 'real life' primary data collection experiences that we can share with colleagues and peers.

**Discussion/Conclusions:** Though we made some progress by establishing early relationships with CMHAs throughout South Dakota, there is more work to be done. The lessons learned from this ongoing program evaluation gives insight to prospective mental health treatment barrier projects in a rural and frontier state. Future researchers would be well advised to establish a more strategic recruitment method. The lack of maintaining strong relationships with key stakeholders at the data collection sites, implementing community-based participatory research and/or program evaluation procedures, and offering an alternative to the internet only survey appears to have slowed recruitment and data collection. It would also be beneficial for future researchers to acquire financial resources as this would allow them to provide compensation to participating CMHAs and incentives for participants.


**Author:** Sara Jares – Social Work  
**Faculty Advisor:** Jarod Giger

34. **Relationship Violence: Attitudes and Beliefs Among College Students in the Upper Midwest**  
**Summary:** Relationship violence is a prevalent social problem, especially among college students. Research about attitudes and beliefs among college students which may contribute to relationship violence has been studied extensively in urban areas, but not in rural areas. This research surveys college students in the upper Midwest about their viewpoints and opinions regarding relationship violence.
to compare with urban research done on this topic. This will allow for prevention and intervention strategies for relationship violence to be developed in rural areas.

**Purpose:** Research widely shows that relationship violence is pervasive not only in urban settings, but in rural communities as well (Peek-Asa, Wallis, Harland, Beyer, Dickey, & Saftlas, 2011). One study found that 79% of college students think dating violence is a major problem (Knickrehm & Teske, 2000). Vast research confirms that relationship violence is a social problem, and college students experience high rates ranging from 20% and 50% (Bryant & Spencer, 2003; Lloyd, 1991). A strong correlation between beliefs supportive of domestic violence and acts of relationship violence has been found by researchers (Archer & Graham-Kevan, 2003; Archer & Haigh, 1999; Bryant & Spencer, 2003). Unfortunately there is a gap in the research concerning rural communities in the Upper Midwest. Our study will examine the variables of the attitudes and beliefs of relationship violence, the current experiences of relationship violence, and the socioeconomic status' of college students across the upper Midwest.

**Methods:** Anonymous online survey with participants recruited through social media.

**Results/Findings:** Data collection in process.

**Discussion/Conclusions:** Pending completion of data collection.

Authors: Gloria Rowen, Stefanie Baxter, Lisa Williams, and Amanda Ekle – Social Work
Faculty Advisor: Peter Kindle

35. **Everywhere But Here: A Look at Sexually Transmitted Infections in the Midwest Among American Indians**

**Summary:** Gonorrhea and chlamydia rates among American Indians (AI) is nearly four times higher than those of non Hispanic, Whites. Comparing data from the Centers for Disease Control (CDC) and using Epi Info, a mapping software by the CDC, we were able to break down gonorrhea and chlamydia rates for North Dakota, South Dakota, Nebraska, Iowa, and Minnesota at the county level for all populations. Data revealed higher rates within counties that are located within the boundaries of reservation lands for these two sexually transmitted infections (STI). Some potential solutions found in the literature for addressing these two STIs include options for clinical care (e.g., Expedited Partner Therapy) and prevention programs (e.g., school-based middle school curriculum). Recommendations will be made for culturally tailored prevention programs for AI that address risk behaviors that lead to STI transmission.

**Purpose:** Gonorrhea and chlamydia rates among American Indians (AI) is nearly four times higher than those of non Hispanic, Whites.
**Methods:** Comparing data from the Centers for Disease Control (CDC) and using Epi Info, a mapping software by the CDC, we were able to break down gonorrhea and chlamydia rates for North Dakota, South Dakota, Nebraska, Iowa, and Minnesota at the county level for all populations.

**Results/Findings:** Data revealed higher rates within counties that are located within the boundaries of reservation lands for these two sexually transmitted infections (STI).

**Discussion/Conclusions:** Some potential solutions found in the literature for addressing these two STIs include options for clinical care (e.g., Expedited Partner Therapy) and prevention programs (e.g., school-based middle school curriculum). Recommendations will be made for culturally tailored prevention programs for AI that address risk behaviors that lead to STI transmission.

*Author:* Jordan Catlett – Health Sciences

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**36. Adult Perceptions of Rural Aging in Place: Strengths and Challenges**

**Summary:** We are conducting research in order to explore the different scenarios people are faced with when growing older. Through our research we are hoping to better define what different ages, financial status, spouse and family involvement, gender, education level, and location means to those who wish to age in place. We hypothesize that people in rural communities would prefer to age in place, given the right resources.

**Purpose:** The purpose of this study is to explore the different scenarios people are faced with when growing older.

**Methods:** We are collecting our data by using an online survey. The instruments we used to build the survey include: The Aging Opinion Survey, The Emotional Appraisal of Nursing Home Placement Tool, The Caregiver Reaction Assessment, and the Caregiver Profile Booklet. The variables of the survey assess the following: financial status, health, emotions about aging, feelings about nursing homes, spouse and family involvement, gender, social values of aging, education level, location, and age.

**Results/Findings:** Data collection is in progress.

**Discussion/Conclusions:** Research is still in progress. Conclusions N/A at this time.

Alzheimer’s Disease America Versus France

Summary: This review is abased on similarities and differences of Alzheimer’s disease which is a neurodegenerative disease, among two different countries, the United States and France. It reviews a few case studies of AD such as what it is, mortality rate, who are most affected, the overall perceived stigma of the disease, how caregivers are overwhelmed and also influenced, which characteristics and risk factors are seen, and precautions on how to lessen the chances of getting Alzheimer’s disease.

Purpose: The purpose of this literary review was to discuss the key risk factors, the nature and magnitude of the health issue in each country, the prevalence of people who are most affected, how the countries are alike and different regarding the health issue, economic and social consequences, and what steps are being taken to address AD.

Methods: The methods used was peer reviewed scholarly research journal articles. Additionally used were websites that included Encyclopedia of the Nations, World Life Expectancy, and Country Economy.

Results/Findings: The results and findings included informing caregivers on different and effective ways of taking care of patients to relieve their stress and improve their lives along with their patients. Another recommendation is to try to strive for better nutrition and life style which include control of obesity, smoking, cholesterol, and high blood pressure. Obtaining a higher educational level could also make a difference in maintaining optimum brain activity.
**Discussion/Conclusions:** In order to improve and eliminate ramifications of AD, more effort and push needs to be put forth into research to identify and accomplish new ways to treat patients and to help others from getting Alzheimer's. Making more people aware of this debilitating disease could increase fundraising into more stem cell research and genetics which could result in finding the cure.

*Author: Elana Kaup - Biology*
*Faculty Advisor: Becky Wolff*

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38. **Patients With Chronic Diseases: Adherence, Depression, Anxiety, and Perception of Nurse Caring Behaviors**

**Summary:** Cardiovascular disease remains one of the leading causes of death for Americans (Thom, et al., 2006). Research has also identified that adherence to a healthy lifestyle, even after a myocardial infarction, is difficult. Even though research has been done on depression and anxiety (Condon, & McCarty, 2006), there is limited research that identifies the nursing caring behaviors that may influence a patient's adherence to medically prescribed outpatient (Phase II) cardiac rehabilitation program.

**Purpose:** The purpose of the this study was to determine if a relationship existed between the patients' perception of nurse caring behaviors and depression, anxiety, and adherence in an outpatient (Phase II) cardiac rehabilitation program.

**Methods:** A descriptive correlational study that used the framework from the Quality-Caring model (Duffy & Hoskins, 2003). Pearson product-moment correlations and Stepwise regression were used. Setting: a community non-profit hospital located in the mid-Atlantic region of the USA. A purposive sample (n=109) included both gender who had attended a minimum of four sessions, spoke English, were greater than 18 years of age, and oriented to time, place, and person. Power set at 0.8, effect size set at 0.3, and alpha set at 0.01 for a medium effect (Cohen, 1987, p. 80).

**Results/Findings:** As the CAT-IV scores (nurse caring) scores increased, the scores for the CES-D (depression) decreased. As the CAT-IV scores (nurse caring) increased, the scores on the STAI-Y-1 (anxiety) decreased. As the CAT-IV scores (nurse caring) increased, the relationship with the participants' adherence did not significantly change. However, 100 (92%) participants adhered to their prescribed program. This is above the national average of 80%. Depression emerged as the strongest predictor when Stepwise regression was conducted (beta -0.22; p<0.05), which accounted for 5% of the variance in the participants' perception of nurse caring. Duffy, Hoskins and Seifert (2007) identified categories that described nurse caring in the Quality-Caring model. The data from participants in this study supported six nursing caring categories: 1) Healing Environment, 2) Attentive Reassurance, 3) Human Respect, 4) Basic Human Needs, 5) Affiliation Needs, and 6) Encouraging Manner.

**Discussion/Conclusions:** Further studies could be done to investigate nurse caring behaviors, depression, anxiety, and adherence as a patient recovers from acute phases of chronic diseases such as COPD, Diabetes, ESRD. The information from this study may be helpful to administrators when establishing hiring criteria for nurses in the outpatient cardiac rehabilitation setting in addition to EKG reading.
This information can also be used to facilitate healthcare provider educational programs with the aim of reducing anxiety and depression for Phase II (outpatient) cardiac rehabilitation patients. This study can be used as a Quality Improvement activity with attention to sleep, food, and attention to family needs identified as items important to patients while modifying lifestyles and/or recovering from a cardiac procedure.


Author: Jo Ann Kim - Nursing

39. **Celiac Disease: Fact or Fad**

**Summary:** Celiac disease is considered an autoimmune disorder affected by the protein, gluten.

**Purpose:** Celiac disease is considered an autoimmune disorder affected by the protein, gluten. This protein is commonly found in wheat, barley, and rye. Intestinal villi are damaged when this protein is consumed, which prevents the absorption of nutrients. The purpose of this systematic review of the literature was to obtain information regarding the effects of Celiac disease on the human body in order to inform healthcare providers about oral manifestations and complications.

**Methods:** A systematic review of the literature was conducted regarding the effects of Celiac disease. The following databases were included in the review: PubMed, CINAHL, The Cochrane Collaboration, and DynaMed. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

**Results/Findings:** Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include screening and diagnostic options, nutritional concerns and related effects on the body, and oral manifestations of Celiac disease.

**Discussion/Conclusions:** Serology and intestinal tissue biopsy are used to diagnose Celiac disease. Patients with a definitive diagnosis of Celiac disease were able to control malnourishment and other systemic difficulties by eating a strict gluten-free diet. Dental
professionals should closely monitor patients for ulcerations, saliva adequacy, enamel defects, and other signs of tissue changes. Referral to the appropriate medical professional is also necessary if the patient has not been diagnosed.

Authors: Kim Murphy, Shelby Engelhaupt, and Hannah Lang – Dental Hygiene
Faculty Advisor: Ann Brunick

40. **Efficacy of Parkinson's Disease Treatments: Levodopa, DBS, and Exercise**

**Summary:** Parkinson's Disease is a progressive neurodegenerative disease with four major symptoms: rigidity, bradykinesia, tremors, and postural instability. Through the use of treatments these symptoms can be managed, but there are also negatives that can result. The present review covers recent empirical evidence regarding the varying efficacy of levodopa, deep brain stimulation, and exercise.

**Purpose:** The present review covers recent empirical evidence regarding the varying efficacy of three very different Parkinson's Disease treatments: levodopa, deep brain stimulation, and exercise.

**Methods:** This research was conducted using online databases. EBSCOhost and Academic Search Premier were used to find scholarly articles. Articles that were searched for were limited to the English language and were no more than ten years old.

**Results/Findings:** Choosing a treatment option can be a daunting task. Some can be effective, but in most cases patients must try multiple treatments to find one that lasts without side effects. The timing of administering certain treatments can also be a factor in treatment outcomes. Sadly, even if a patient does find an effective treatment there are barriers that can decrease compliance. Overall, there are old and new treatment options for individuals suffering from Parkinson's Disease, but patients must be willing to commit themselves to the treatment journey with their healthcare provider.

**Discussion/Conclusions:** Parkinson's Disease is a neurodegenerative disease that will continue to affect the lives of individuals. Due to the large array and variability in symptoms, healthcare providers must be knowledgeable managing the presenting symptoms. Levodopa, deep brain stimulation, and exercise are all options that are still being researched. This extended research will allow providers to advise patients on the best possible treatments to manage their symptoms. If treatments are used effectively, patients can improve their quality of life and experience a lifestyle that is similar to the life they had before the diagnosis of this progressive disease.

Author: Marissa Meyer – Physician Assistant Studies
Faculty Advisor: William Schweinle
ALS Awareness

Summary: Amyotrophic lateral sclerosis (ALS) is a neurodegenerative motor disease that affects 25,000 people in the United States.

Purpose: Amyotrophic lateral sclerosis (ALS) is a neurodegenerative motor disease that affects 25,000 people in the United States. The purpose of this systematic review is to raise awareness to the general population, but to also provide dental practitioners with the necessary knowledge on how to treat ALS patients in the dental office.

Methods: A systematic review of the literature was conducted regarding ALS and its dental considerations. The following databases were included in the review: The Cochrane Collaboration, the Canadian Dental Hygienists Association, CDHA Journal, Acta Odontologica Scandinavica, International Journal of Epidemiology, International Journal of Risk and Safety in Medicine, and Dental Economics. Articles published in peer-reviewed journals were used to include systematic reviews, meta-analyses, RCTs, cohort studies, and case reports. Additional supportive information was obtained from professional, educational, or governmental websites.

Results/Findings: Several articles met the inclusion and exclusion criteria. Important topics present throughout the research include the history, causes, presentations, treatment options, and how ALS relates to the dental office and dental outreach programs.

Discussion/Conclusions: Currently, there is no cure for ALS. Treatment options are limited and focus on palliative care. Lifespan from the time of onset is very short. The largest cause of death is from aspirating saliva, thereby causing pneumonia. Patients and caregivers need to be instructed by health professionals on the importance of keeping the oral cavity as healthy as possible in order to reduce the number of microorganisms that could be aspirated by the patient.

Authors: Monica Bentz, Taylor Tatge, and Shayna Berke – Dental Hygiene
Faculty Advisor: Ann Brunick