

The Sixteenth Annual  
*Ranger Research Day*

Friday, November 19, 2021

Via Zoom



**LIST OF  
ABSTRACTS**

The Sixteenth Annual  
**Ranger Research Day**

Northwestern Oklahoma State University  
 Alva, Oklahoma ~ Friday, November 19, 2021  
 Via Zoom

# ABSTRACTS

## *Art & Music*

### *1.01 Art & Design*

#### **1.01.01, “Ranger Projections” [Poster]**

**Chris Chauncey (Dr. Steven Maier, Sponsor)**

**9:30 a.m.** <https://zoom.us/j/96126000402>

As part of my C-STEM investigations class, I designed a 3-D sculpture of the Ride Rangers Ride Logo using TinkerCAD to design the sculpture while using MakerBot software to print the sculpture. The sculpture, when illuminated with a light source at a certain angle, will project shadows that represent the areas of science that NWOSU has to offer its students.

To represent the physical science part of the Science Department, a physics pun that has a hidden message will be displayed. Also, a constellation of the Ranger Logo will be projected to help represent the physical sciences. The natural sciences part of the project will be represented with an inspirational saying, “When handed mold, make penicillin.”

The purpose of this project is to show a connection between art and science. The sculpture is an easy way to show the concept of how light and opaque material create shadows. These types of materials absorb light and in return produce an absence of light, also known as a shadow, which will then create an image of the material.

## *Liberal Arts*

### *4.02 English*

#### **4.02.01, “An Incurable Disease in Chrystos's Poem ‘Today Was a Bad Day Like TB’” [Paper]**

**Angel Marshall (Dr. Kathryn Lane, Sponsor)**

**10:00 a.m.** <https://zoom.us/j/96126000402>

An incurable disease has monumental impact on those infected as well as those who surround them. There are few situations comparable to a disease that carries such

magnitude. In Chrystos's poem "Today Was a Bad Day like 'TB'" the speaker compares an incurable disease with having witnessed the practicing of cultural appropriation. TB, formally known as tuberculosis, is a disease that once left Native American tribes devastated by its fatal force. The speaker mentioning tuberculosis and appropriation in the same context gives the reader insight on how repulsing it is to witness one that has no right mimicking and partaking in a sacred cultural practice.

The history regarding Native Americans and the forced removal is often misconstrued or blatantly ignored. Native Americans had no desire to live as those outside of their tribes. Before the removal began, indigenous people lived off the grace of the land while depending on their faith, and respecting all that nature had to give. Settlers' began to intrude and take away all that natives knew. They were forced away from all they had created and all that was indigenous. This paper will evaluate cultural elements and traditions of Native Americans and the former marginalization of the heritage that is now somehow praised and appropriated.

## ***Math & Science***

### *6.06 Nursing*

#### **6.06.01, "Bedside Shift Report: Impact and Safety Outcomes" [Poster]**

**Jake Scott & Ybet Nieto-Vargas**

**(Prof. Heidi Ritchie, Sponsor)**

**8:30 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dEiUMjNWQ0xRdTN6UT09>

Bedside reporting is a common method of relating pertinent patient information to oncoming nurses. This event can signal the betterment or detriment of the patient's condition based upon how well the information is relayed. Standardized reporting is an intervention used to limit interruptions and distraction. This study aims to examine how adherence to standard reporting protocol effects patient safety. In a literature review/ meta-analysis style, two nursing student researchers examined 24 research articles that appeared in CINHAI databases using keywords "compliance," "standard bedside reporting," "patient safety," and "communication breakdown." Eight articles were selected, reviewed, and analyzed to identify outcomes associated with compliance to standardized bedside report. Literature review identified that institution of standardized bedside reporting lead to increased Press Ganey, patient satisfaction scores. It was also associated with positive results in nursing staff satisfaction surveys. Compliance to standardized reporting also led to a 6% reduction in readmission rates following 30 days after discharge. Patient safety was considered to be increased, as the intervention caused a 12% reduction in fall rates. This literature review suggests that compliance to a standardized bedside report leads to reduced readmission rates, reduced fall rates, and increased satisfaction scores. The data all suggests promising outcomes for maintaining adherence to a standardized bedside report. The data is very pertinent to nursing practice, but needs to be studied in a larger scale study, all literature reviewed had the limitation of small sample sizes. Identification of the most appropriate method for teaching a standardized report

### 6.06.02, “Benefits of Skin-to-Skin Contact” [Poster]

**Kayla Olson & Aleyna Archer**

**(Dr. Leslie Collins, Sponsor)**

**9:00 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dElUMjNWQ0xRdTN6UT09>

During labor and birth, infants are exposed to several different stressors that may affect their adjustment to life outside the womb and overall wellbeing. These stressors can vary in intensity and include the difficulty of the labor, the infant’s medical needs, the external environment such as lights or separation from the mother, as well as many others. Not only can complications exist for the newborns, but in 2017 alone, 295,000 maternal deaths were reported due to complications of labor and birth. Skin-to-skin contact, the process in which a naked infant is placed vertically on their mother’s breast and covered with a warm blanket, has been shown to have extremely positive benefits on both the newborn and the mother after birth. Specific benefits that skin-to-skin contact has been proven to have are better breastfeeding outcomes, improved bonding between mother and baby, reduction in neonatal and maternal stress levels, neonatal thermoregulation, protection from infection, respiratory and cardiac stability, as well as decreased reports of maternal deaths and long hospital stays. Although skin-to-skin contact has been proven to be beneficial to both the newborn and the mother, a lack of knowledge, interruptions in the contact, and absence of guidelines are just some barriers that have come in the way of its use when caring for mothers and their babies. Skin-to-skin is a life-saving healthcare technique that should be recommended for at least one hour uninterrupted to all new mothers to achieve the full benefits it offers.

### 6.06.03, “Alternative Birthing Positions vs. Traditional Lithotomy”

[Poster]

**Kailei Settle, Cassandra Mead, & Mitzi Pemberton**

**(Dr. Leslie Collins & Prof. Keera Byrd, Sponsors)**

**9:30 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dElUMjNWQ0xRdTN6UT09>

In standard practice, the lithotomy position is widely used for labor and delivery. The standard lithotomy position is characterized by the patient laying on their back with hips and knees fully flexed and legs spread apart (feet may or may not be in stirrups). In some cases, this is done without alternate options or education regarding positioning given to the laboring mother. Standard practice of lithotomy position risks may include supine hypotension, longer duration of labor, increased labor pain, increased rates of episiotomies, decreased autonomy, and decreased patient (maternal and neonatal) satisfaction/outcomes. However, benefits of alternative birthing positions (squatting, standing, hands-and-knees, kneeling, semi-recumbent, use of positioning devices) outweigh the associated risks. The benefits may include shorter duration of labor, decreased labor pain, decreased rate of episiotomies, decreased blood loss/hemorrhage, fewer abnormal fetal heart rate patterns, decreased need for epidural, increased autonomy, and increased patient satisfaction/outcomes. Statistics show that the squatting position increases the pelvic outlet by approximately 30% facilitating a less complicated birth. A similar study shows that 2/3 of infants who were transferred to the NICU (neonatal intensive care unit) upon delivery, had mothers who gave birth while in the lithotomy position and/or in stirrups. Providing prenatal education regarding positioning during labor can increase patient autonomy, satisfaction, and outcomes. Patients are more likely to be receptive to teaching if they are supported in their decision by their healthcare team.

#### **6.06.04, “Infection Control Awareness & Decreasing HAIs in Healthcare Settings” [Poster]**

**Ashlie Wilhite & Caitlin Johnson  
(Dr. Jennifer Mahieu, Sponsor)**

**10:00 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dEiUMjNWQ0xRdTN6UT09>

Through the development of this evidenced-based practice (EBP) we have researched the idea that if healthcare workers’ awareness of infection control was increased then in return healthcare associated infections (HAIs) would be reduced. There have been several studies supporting this idea to be true. An example of a study that demonstrates this was by Omar, et al; the study brought attention to infection control criteria to decrease HAIs and as a result, there was a marked reduction in ventilator-associated pneumonia, Catheter line-associated bloodstream infection declined from above to below the benchmark. Catheter-associated urinary tract infection rates showed a noticeable reduction. Hand hygiene adherence showed an improvement from 80% to 84%. The significance of this EBP is that if healthcare workers had a higher level of awareness of infection control standards and precautions the further decreased the incidence of HAIs will become, thus causing the duration of the patients stay to become minimized, saving the patient physiological and psychological stress and relieving the healthcare workers of stressors of high patient-staff ratios and acute critically-ill patients. The change this research may make was identified by Jia, et. al stating Healthcare-associated infections not only threaten the patients’ health and life but also bring additional economic burden to the patients and healthcare system including direct economic loss and prolonged hospitalization.

#### **6.06.05, “Reducing the Diagnosis of Postpartum Depression in Adolescent Mothers” [Poster]**

**Adria Lujan, Carys Delaplane, & Makenna Montgomery  
(Dr. Leslie Collins, Sponsor)**

**10:30 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dEiUMjNWQ0xRdTN6UT09>

Postpartum depression is characterized by the symptoms of severe depression and irritable moods from one day to 12 months after the birth of an infant. Adolescent mothers are at an increased risk for postpartum depression compared to their adult counterparts due to their developmental changes, lack of a stable support system, low socioeconomic status, and lack of education. Adolescent mothers often do not realize that they are experiencing feelings of depression as they are closely related to the expected outcomes of becoming a mother. Maternal postpartum depression is linked to difficulty transitioning into a motherhood role and difficulty meeting the infant’s needs. By providing individual patient care based on the adolescent mother’s risk factors and needs, health care workers can help prevent a diagnosis of postpartum depression. Health care professionals need to be educated on screening adolescent mothers for their risk factors for postpartum depression, signs of depression, and the mother’s views of postpartum depression. By talking to the adolescent mothers, health care professionals can help decrease the stigma behind depression as well as provide education, early screening, and individualized care to prevent the diagnosis of postpartum depression. The focus of this project is to determine the best interventions in order to decrease the prevalence of the diagnosis of postpartum depression in adolescent mothers.

### 6.06.06, “Benefits of Job Shadowing” [Poster]

**Calli Lewis & Sydney Hamill**

**(Dr. Leslie Collins, Sponsor)**

**11:00 a.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dElUMjNWQ0xRdTN6UT09>

The purpose of this project was to determine the benefits of high school sophomores through high school seniors' job shadowing before entering a specific career field. Job shadowing involves observing a professional for a short time to understand the skills necessary for that position. The research shows that participating in job shadowing is beneficial for numerous reasons. First, it empowers a person to find a passion for a career. Second, it provides the opportunity to experience the workplace environment in real-time. Third, the participant gains knowledge about the profession, which helps determine if a career would be suitable, while also building a professional résumé. Lastly, professional relationships are created for future careers by partaking in job shadowing. Examples of job shadowing opportunities include career fairs, Medical Avenues in Service and Health (M.A.S.H) Camps, internships, and externships. The research has demonstrated that high school sophomores to high school seniors benefit from job shadowing in the careers of the students' areas of interest.

### 6.06.07, “Hypnosis vs Opioids for Chronic Pain Management” [Poster]

**Kyle Birch & Stephanie Haddock**

**(Dr. Amanda Clepper, Sponsor)**

**11:30 p.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dElUMjNWQ0xRdTN6UT09>

This evidence-based practice project focuses on comparing the effectiveness of hypno-analgesics and oral opioids for chronic pain management. Hypnotherapy is a non-pharmaceutical treatment that uses mind-body intervention to focus attention and achieve a heightened state of mindfulness which aids in the treatment of medical and psychosocial disorders. Chronic pain is defined as persistent pain lasting longer than 3 months. Chronic pain is often the result of a disease process or injury due to the lasting effects of structural tissue damage, which makes finding efficacious treatment in the clinical setting challenging. While opioids effectively reduce severe pain, it has many side effects and has the risk of abuse and addiction, making this treatment less desirable to some patients. These studies shared one commonality; participants who received hypnotherapy showed significant decreases in pain and anxiety compared to those who received pharmacological therapy alone or in conjunction with other complementary therapies.

### 6.06.08, “Oral Antibiotic Therapy Vs. Intravenous Antibiotic Therapy”

[Poster]

**Cassie Chavez & Amber Hernandez**

**(Dr. Amanda Clepper, Sponsor)**

**12:00 p.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dElUMjNWQ0xRdTN6UT09>

The purpose of this project is to answer the question “Among clients with chronic infection, what are the effects of oral antibiotics compared to those receiving intravenous antibiotics on effectively treating infection within six months or less of initiating treatment?” Intravenous antibiotic therapy has been used as the route of choice when administering antibiotic therapy. Within the last five years there have been many studies that have shown

oral antibiotic therapy to be just as effective at treating infections as intravenous, or at least noninferior to intravenous antibiotic therapy. Oral antibiotic use has been shown to prevent complications that are associated with intravenous antibiotic therapy such as phlebitis, extravasation, infiltration, air embolism, and infection at the insertion site. The use of oral antibiotic therapy over intravenous also has the benefits of decreasing or limiting patient hospitalization times, as well as decreasing health care costs due to hospitalization required for intravenous antibiotic therapy. The effectiveness, decrease of complications, decreased hospitalization times, and decreased healthcare costs resulting from oral antibiotic use can increase patient outcomes and satisfaction.

#### **6.06.09, “RN Job Satisfaction” [Poster]**

**Melissa Bancroft, Courtney Scott, & Candyce Marmolejo  
(Dr. Shelly Wells, Sponsor)**

**12:30 p.m.** <https://zoom.us/j/92636401977?pwd=NThHdHBmTnI3dEElUMjNWQ0xRdTN6UT09>

Job satisfaction is a key factor in retaining registered nurses (RNs) at a facility. Multiple factors may keep an RN long-term at a facility as opposed to some that only work there short-term. These factors include things such as a fair salary, management’s active role, workplace relationships, overall health status, and the politics of the workplace. The focus of this evidence-based practice project is to answer the following PICO question. In the RNs working in hospitals, what is the effect of finding work-life balance and satisfaction in hospital staff nurses in comparison to travel nurses on satisfaction with home and work-life balance? Travel nurses on average work a 13-week contract to fill in where there is a nursing shortage. The methods used to arrive at the conclusions in the articles were obtained by surveys, phone interviews, and questionnaires. Findings for this project vary greatly among age, sex, ethnicity, and culture as well as many other variables. Per the research articles, travel nurses make a significant amount more than facility nurses. Implications of this study are not yet fully known. More research studies need to be conducted on these topics.

### *6.07 Physics & Engineering*

#### **6.07.01, “Operation: RRR2-D2” [Poster]**

**William Cody Cospers (Dr. Steven Maier, Sponsor)**

**8:30 a.m.** <https://zoom.us/j/96126000402>

Imagine one of the most iconic droids in film history being brought to campus. That is my intention with this project. Hopefully, by the end of the semester, I will have a functioning R2-D2 droid from the movie saga *Star Wars* by George Lucas. The goals of the project are to have an operational R2 Droid; ensure sound structure and robust design; and to explore autonomous functionality. I fully intend on making this droid as capable as time allows. The finished product should have the ability to move on a dual-independent wheel design involving two motors attached to wheels as well as allowing the head to swivel a full 360 degrees in the same manner as in the films. The overall design was created on Tinkercad, allowing for all parts to be 3-D printed in with a lightweight filament. The parts for the droid will be printed on the 3D printer located in the Science Building.

**6.07.02, “Piano Staircase” [Poster]****Sharon Boeckman (Dr. Steven Maier, Sponsor)****9:00 a.m.** <https://zoom.us/j/96126000402>

Doing research on and learning the basics of how to code can unlock a world of creative and entertaining projects. Even if a person has no experience of any coding or does not even know any coding programs, countless people and videos are willing to provide an extra hand to help one learn. Coding projects can bring interest to areas that are very unassuming and unamusing otherwise. Transforming a simple staircase into a musical instrument, by creating a piano note with each step taken, creates a joyous surprise for every person who walks up or down the stairs. With the harmonious creation being placed in the science building, the goals are to bring more people into the building and make the beginning and end of classes more pleasurable. Once the piano staircase is in place, students will be excited to go to class in the science building. Every day, the students will be able to see and hear something that has been made by another student using the sources provided by the school