

CSU-Pueblo
6th Annual

2018 STUDENT SYMPOSIUM

A Celebration of Research, Scholarship & Creative Activity

Friday, April 6, 2018

SPECIAL THANKS TO OUR SYMPOSIUM SPONSORS



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SIGMA THETA TAU
COMMUNITIES FOR BUILDING STEM
ENGAGEMENT (CBASE)
DEPARTMENT OF MUSIC

Symposium Schedule

7:30–10:00 AM	Registration and breakfast	HSB Lobby
8:00–9:50 AM	Poster Presentations Session 1D Session 1E Session 1F	HSB 110 HSB 111 HSB 120
8:30–9:40 AM	Oral Presentations Session 1A Session 1B Session 1C	HSB 108 HSB 113 HSB 122
9:50–11:00 AM	Oral Presentations Session 2A Session 2B Session 2C	HSB 108 HSB 113 HSB 122
10:00–11:50 AM	Poster Presentations Session 2D Session 2E Session 2F	HSB 110 HSB 111 HSB 120
11:10–12:20 PM	Oral Presentations Session 3A Session 3B Session 3C	HSB 108 HSB 113 HSB 122
12:00–12:30 PM	Lunch	Hoag Hall Foyer
12:30–1:30 PM	Provost's Welcome and Keynote <i>Dr. Audrey Lundahl, Texas Woman's University</i>	Hoag Hall
1:30–2:30 PM	Art Show	Art Gallery
1:40–2:50 PM	Oral Presentations Session 4A Session 4B Session 4C Session 4D	HSB 108 HSB 113 HSB 122 LARC 109
1:40–3:30 PM	Poster Presentations Session 4E Session 4F Session 4G	HSB 110 HSB 111 LARC 108
2:45–3:15	Snack Break	LARC Lobby
3:00–4:10 PM	Oral Presentations Session 5A Session 5B Session 5C Session 5D	HSB 108 HSB 113 HSB 122 LARC 109

Program

1A: Oral Presentations

8:30–9:40 AM

HSB 108

MODERATOR: *Carla Howard*

Seizure prophylaxis in TBI

Christy Peters, Adult/Gerontology Acute Care Nurse Practitioner

Nonepileptic Seizures

Christina Steinmetz, Adult/Gerontology Acute Care/Family Nurse Practitioner

Pharmacological vs. Surgical treatment of CTEPH

Lindsey Bollinger, Adult/Gerontology Acute Care/Family Nurse Practitioner

1B: Oral Presentations

8:30–9:40 AM

HSB 113

MODERATOR: *Jacinda Heintzelman*

The Watchman Device an Alternative in Stroke Prevention for Individuals with Atrial Fibrillation

Leah Ruch, Adult/Gerontology Acute Care/Family Nurse Practitioner

Glucagon-Like Peptide-1 (GLP-1) Receptor Agonists and Metformin in Prediabetes

Daniel E. Marquez, Adult/Gerontology Acute Care/Family Nurse Practitioner

Ketogenic Diet: Benefits in Type 2 Diabetes

Amanda Hrycaj, Adult/Gerontology Acute Care/Family Nurse Practitioner

1C: Oral Presentations

8:30–9:40 AM

HSB 122

MODERATOR: *Claudia Imes*

Concomitant use of Tobacco and Marijuana: A Fast Track to COPD?

Karla Richardson-Trujillo, Adult/Gerontology Acute Care/Family Nurse Practitioner

Treatment of High Altitude Pulmonary Edema (HAPE) with Nifedipine

Kimberly Jones, Adult/Gerontology Acute Care/Family Nurse Practitioner

Utilization of High-Flow Nasal Cannula in the Prevention of Intubation in Patients with Chronic Obstructive Pulmonary Disease

Amber Doss, Adult/Gerontology Acute Care Nurse Practitioner

1D: Poster Presentations

8:00–9:50 AM

HSB 110

MODERATOR: *Susan Belpert*

Tranexamic Acid and Mortality Rates in Mass Transfusion Protocols

Cassie McCullough, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Kathy Michael*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Brandis Montez*, Adult/Gerontology Acute Care/Family Nurse Practitioner

Electrophilic Fluorination of Aromatics: Developing New Experiments for the Undergraduate Organic Chemistry Laboratory

Mikelah Suzuki, Chemistry, *Kelly Sheehan*, Chemistry, *Alejandro Otero*, Chemistry, *Jade Garcia*, Undeclared - High School student

The Impact of Developmental Lead (Pb2+) Exposure on a Model System, *Drosophila pseudoobscura*

Hugh Long, Biology, *Dr. Elizabeth K. Peterson*, alumni, *Tyler Harvey*, Biology

Synthesis of Carboxyhydro-1,2,4,5-Tetrazines and Tetrazines for Polymerization to Polyesters

Cassandra Perlick, Biology, *Andrew Shannon*, Chemistry

Surface Based Molecular Sensor for Naked Eye Cyanide Detection

Cameron Collins, Biology, *Sean Love*, Biology

Increasing Efficiency of Ethanol Production from Crude Glycerol and *Enterobacter aerogenes*

Amanda Mayes, Chemistry

Polish-Lithuanian Constitution of 1791

Christian Montes, History

Use of 3D ordered macroporous metal oxides intercalated with MoS₂ for efficient hydrogen-evolving reaction

Daniel Conroy, Chemistry and Biology

Incendiary Memories: The Legacies of the Dresden Firebombing

Abigail Seman, History

Acoustic Sensor Design for Concrete Bridge Deck Inspection

Julian Fierro III, Mechatronics

Study of Memristors for AI Applications: Modeling, Characterizations, and Applications

Jonathan Hannan, Mechatronics

The Effectiveness of Medications versus Exercise for the Diagnosis of Depression

Aimee Harmon, Nursing, *Alexandra Garst*, Nursing, *Sierra Darling*, Nursing

1E: Poster Presentations

8:00–9:50 AM

HSB 111

MODERATOR: *Lisa Gray*

Septic Protocol Use vs Non-Use of Septic Protocol Effects on Mortality

Dalia Holguin, Nursing, *Aubrey Urban*, Nursing, *Daniel Kyle*, Nursing, *Melissa Navarrette*, Nursing, *Heather Fortner*, Nursing, *Heather Templeton*, Nursing, *Shatiya Wright*, Nursing

Does mobilizing ventilated patients lead to better patient outcomes than waiting until extubation to mobilize?

Tami Jo Hentschelmann, Nursing, *Travis Ford*, Nursing, *Laura Prieditis*, Nursing, *Mandy Smith*, Nursing, *Phainis Onyango*, Nursing, *Carisa Medina*, Nursing, *Cherry Evans*, Nursing

Cannabis: An Effective Alternative for Managing Chronic Pain

Justina Gonzales, Nursing, *Ofelia Sifuentes*, Nursing, *Roy Cerda*, Nursing, *George Miller*, Nursing, *Carly Rey-Hayes*, Nursing, *Alyssa Wyberg*, Nursing, *Kelly Zandbergen*, Nursing

First Time NCLEX Success

Stevi Krier, Nursing, *Hallie Greene*, Nursing, *Kayleigh Guadagnoli*, Nursing, *Kelly Johnson*, Nursing, *Kaleb Hansen*, Nursing, *Kaela Becker*, Nursing, *Kaitlin Crowley*, Nursing

Transdermal Aromatherapy: An Emerging Solution to Chronic Pain Management

Jessica Eaton, Nursing, *Dora Agyeman*, Nursing, *Huria Tossa*, Nursing, *Geoffrey Kipkoech*, Nursing, *Leah Bost*, Nursing, *Bryli Klipfel*, Nursing, *Isabel Taylor*, Nursing

Acute Respiratory Distress Syndrome: Prone vs. Supine Positioning

Tara Eastman, Adult/Gerontology Acute Care Nurse Practitioner, *Sean Wallis*, Adult/Gerontology Acute Care Nurse Practitioner, *Joshua Chambers*, Adult/Gerontology Acute Care Nurse Practitioner, *Michelle Straight*, Adult/Gerontology Acute Care Nurse Practitioner

Influenza Vaccine: live attenuated immunization versus inactivated immunization

Tristan Strickland, Nursing, *Mike Williams*, Nursing, *Alli Wurscher*, Nursing, *Lexi Latika*, Nursing, *Eryn Salinas*, Nursing, *Kaylie Margison*, Nursing, *Ashlee Hanavan*, Nursing

The Utilization of Animal Fecal Matter as a Diagnostic for Exposure to AOCs in Freshwater Aquatic Environments

Keenan Wyatt, Chemistry, *Nicholas Androes*, Chemistry

Phosphohydrolase activities in phosphate-restricted, iron (II)-supplemented Modified Raulin Thom Penicillium spinulosum cultures

Sarah Lira, Chemistry

Environmental and Human factors on Lark Bunting reproductive success and populations

Connor Dowd, Biology

The impact of glucose uptake and concentration on Sindbis Virus infection

Oluwatobi Oloyede, Biology, *Erika Krow*, Biology, *Ying Ying Xue*, Biology, *Victoria Perez*, Biology

1F: Poster Presentations

8:00–9:50 AM

HSB 120

MODERATOR: *Elizabeth Christian*

Prevalence of West Nile Virus Antibodies and Blood Mercury Levels in Song Birds Collected from the Colorado Fountain Creek Region

Alyssa Torres, Biology, *Kayana Casias*, Biology

Febrile Seizures: Treating Fevers or Not

Seana Maltezo, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Erika Valdez*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Alonzo Lobato*, Adult/Gerontology Acute Care/Family Nurse Practitioner

Tortoises show strong innate immune function instead of immunological memory

Kiara Olson, Biology, *Brandon Bayer*, Biology, *Taylor Urban*, Biology

Tamiflu Timing

Kimberly Crapeau, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Nicole Bartolo*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Stacie Ramos*, Adult/Gerontology Acute Care/

Family Nurse Practitioner, *Joe Estes*, Adult/Gerontology Acute Care/Family Nurse Practitioner

Extracorporeal Membrane Oxygenation (ECMO) Influencing Influenza Outcomes

Jennifer M. Weiss, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Carissa Shea*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Kristin Chevalier*, Adult/Gerontology Acute Care/Family Nurse Practitioner

Who Were the Vikings: A Closer Look at Viking Culture

Desiree Lewis, Liberal Studies and Education

The Dangerous Queen: Margaret of Anjou and the Wars of the Roses

Isabel Ivery, History

Control and Cruelty: The Norman Conquest of England

Jason Curtiss Jr., History

Constantinople: The Modernization of Warfare in the 15th Century

David Armstrong, History

Sex Ratio Biasing In Lark Buntings (*Calamospiza melanocorys*)

Makenna Fair, Wildlife and Natural Resource Management

The Bikini Bottom: The Lifeways of Marshallese Islanders Since WWII

Spencer Little, History

2A: Oral Presentations

9:50–11:00 AM

HSB 108

MODERATOR: *Claudia Imes*

Treatment of Gonorrhea

Adrianna Allen, Adult/Gerontology Acute Care/Family Nurse Practitioner

Rapid Antigen Detection Test Vs. CENTOR Criteria to Diagnose Strep Throat

Yaghma Norouzi, Adult/Gerontology Acute Care Nurse Practitioner

Treatment of Vitamin D Deficiency in Adults

Irene Rawls, Adult/Gerontology Acute Care/Family Nurse Practitioner

2B: Oral Presentations

9:50–11:00 AM

HSB 113

MODERATOR: *Carla Howard*

Blunt Abdominal Trauma: Positive Seat Belt Sign

Crystal Michelle White, Adult/Gerontology Acute Care/Family Nurse Practitioner

Permissive Hypotension in Trauma Patients

Christine Christiansen, Adult/Gerontology Acute Care/Family Nurse Practitioner

Tranexamic Acid: Use in Hemorrhagic Shock

Jennifer Merten, Adult/Gerontology Acute Care/Family Nurse Practitioner

2C: Oral Presentations

9:50–11:00 AM

HSB 122

MODERATOR: *Jacinda Heintzelman***Cannabinoid Hyperemesis Syndrome: Haloperidol Treatment Compared To Ondansetron***Joseph Miller*, Adult/Gerontology Acute Care/Family Nurse Practitioner**A Pueblo Crisis***Anna Horton-Symons*, Business Administration**Reducing Neonatal Abstinence Syndrome***Tina Tripp*, Adult/Gerontology Acute Care/Family Nurse Practitioner**2D: Poster Presentations**

10:00–11:50 AM

HSB 110

MODERATOR: *Susan Belpert***A Review of the Effectiveness of Needle Exchange Programs in Decreasing the Incidence of HIV Transmission Within Studied Populations***Matthew Leberknight*, Nursing, *Caitlin Weaver*, Nursing, *Sabaja Lobith*, Nursing, *Kelly McLean*, Nursing, *Rebecca Ketchum*, Nursing, *Janine Dillaha*, Nursing, *Daniel Townzen*, Nursing**Under Pressure: The Use of Pressure Relieving Mattresses***Leslie Roberts*, Nursing, *Aubrienne Lewellen*, Nursing, *Shannon Pedzinski*, Nursing, *Rose McMurphy*, Nursing, *Lisa Muff*, Nursing, *Savannah Nicks*, Nursing, *Curtis Bennett*, Nursing**Pedestrian Walking Speed in Pueblo***Shelby Nesselhauf*, Civil Engineering Technology and Construction Management, *Nicholas Wibbenmeyer*, Civil Engineering Technology**Robotic or redundant: a comparison study review of the da Vinci Surgical System and standard laparoscopic procedures***Kelly Bekeris*, Nursing, *Sharice Jones*, Nursing, *Noemi Miller*, Nursing, *Taylor Engle*, Nursing, *Josh True*, Nursing, *Lauren Leopold*, Nursing, *Jesslyn Liwanag*, Nursing**COPD and Telehealth***Jennifer Slane*, Nursing, *Ryan Parnes*, Nursing, *Anabi Najar Madera*, Nursing, *Samson Mutua*, Nursing, *Roberto Chacon*, Nursing, *Angelina Mungia*, Nursing, *Michael Sage*, Nursing**Put A Cap On It!***Renee E. Gribble*, Nursing, *Heather J. Knox*, Nursing, *Hui Jeong Kim*, Nursing, *Karla M. Dunston*, Nursing, *Kayla D. Smith*, Nursing, *Danielle M. Miller*, Nursing, *Samantha A. Geisick*, Nursing**Biking Speed in Pueblo***Krystal Vallejos*, Civil Engineering Technology, *Griselda Aaraujo*, Civil Engineering Technology**Shorter Shifts or Longer Weekends***Darian Horvat*, Nursing, *Ashley Richardson*, Nursing, *Mercedes Trujillo*, Nursing, *Bryanna Houser*, Nursing, *McKenzie Pacheco*, Nursing, *Brittany Guerro*, Nursing, *Jalissa Peterson*, Nursing**Defect Detection and Location in Wind Turbine Tower Using Vibration Analysis***Francesca Montoya*, Industrial Engineering, *James Steel*, Mechatronics Engineering**Defect Detection and Location in Wind Turbine Tower Using Vibration Technique***Francesca Montoya*, Mechatronics, *James Steele*, Mechatronics**Rocky Mountain Goats (*Oreamnos americanus*) habitat ranges and changing environments effects on Quandary Peak***Rocky Spencer*, Wildlife and Natural Resource Management**Project Azorian: The CIA's Secret Operation to Recover a Lost Soviet Nuclear Submarine***Albert L. Marshall*, History**2E: Poster Presentations**

10:00–11:50 AM

HSB 111

MODERATOR: *Carol Daugherty***Quality of Life in ALS Patients: Psychological Interventions***Jessie Niedens*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Brianna Jackson*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Charles Cobb*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Jacob Scott*, Psychiatric-Mental Health Nurse Practitioner**Effects of Childhood Trauma on Adult Mental Health***Matthew Augerot*, Psychiatric-Mental Health Nurse Practitioner, *Eric Moore*, Psychiatric-Mental Health Nurse Practitioner, *Rebecca Hearst*, Psychiatric-Mental Health Nurse Practitioner, *Julie Clark*, Psychiatric-Mental Health Nurse Practitioner**Design of Steel Structure Inspection Robot***Seth Marquez*, Mechatronics, *Zachary Miketa*, Mechatronics**Ionic Polymer Metal Composites (IPMC) Characterization***Marc-Anthony Smith*, Mechatronics, *Hassan Abdulkareem*, Mechatronics, *Brandon DeHerrera*, Mechatronics**Electrospinning Process Applications***D. Mike Daniel*, Mechatronics, *Shamas Ubazanfar*, Mechatronics**Study of Digital Light Projection (DLP) 3D Printing Technologies***Kalvin Hessling*, Mechatronics, *Kyle Rosenbrock*, Mechatronics, *Marcus Martinez*, Mechatronics**The Cadaver Synod: Interdependence of the Church and Politics in 9th Century Italy***Spencer Little*, History**The Renaissance: The advancement in Science & Technology***Phillip Preuss*, Biology**New Atheism***Alec Welsh*, Journalism**How Mental Practice Can Work for You***Abigail Silverberg*, Performance Major, Piano Emphasis**A Daring Leap: The History of the Great Friesian Horse and How it Impacted Europe***Divina Gallegos*, History, Secondary Education emphasis**2F: Poster Presentations**

10:00–11:50 AM

HSB 120

MODERATOR: *Lisa Gray***The Effect of Oxidative and Metabolic Stress on Alphavirus Infection***Kyle Boyd*, Biology, *Erika Krow*, Biology, *Sarah Tyler*, Biology

Analysis of the Mitochondrial Changes during Sindbis Virus Infection*Maxwell Sheedy, Biology, Jessica Costlow, Biology***Is Buprenorphine the new Methadone?***Robert Didericksen, Psychiatric-Mental Health Nurse Practitioner, John Tripp, Psychiatric-Mental Health Nurse Practitioner, Faustina Mensah, Psychiatric-Mental Health Nurse Practitioner, Letitia Sam, Psychiatric-Mental Health Nurse Practitioner***Opioid Dependence: Psychosocial Interventions and Treatment Compliance***Tina Nance, Psychiatric-Mental Health Nurse Practitioner, Alison Haddad, Psychiatric-Mental Health Nurse Practitioner, Fnu Rajani, Psychiatric-Mental Health Nurse Practitioner, Azra Van Hove, Psychiatric-Mental Health Nurse Practitioner***Neuro Trauma Treatment***Aja Petracca-Lennon, Adult/Gerontology Acute Care/Family Nurse Practitioner, Sara D Campbell, Adult/Gerontology Acute Care/Family Nurse Practitioner, Lindsey Dazzo, Adult/Gerontology Acute Care/Family Nurse Practitioner, Brandi Trujillo (Martinez), Adult/Gerontology Acute Care/Family Nurse Practitioner***Creation and Application of a New qPCR Technique Specific to a Turtle Mycoplasma***Rachel M. Ruiz, Biology***CB2 Mediated Antiviral Activity in Hepatocytes***Joseph Lopez, Biology***American Intervention in Laos: A Conflict in the Shadow of Vietnam***David Armstrong, History***Alterations to mitochondrial metabolic pathways during cannabinoid activation of CB1 receptors within Human Hepatocytes***Juan L. Rodriguez, M.S. Biology***Development of an efficient method for the isolation of cannabinoids from bulk industrial hemp***Collin Arellano, Chemistry***Co-infection with *M. agassizii* and *P. testudinis* and its effect on Upper Respiratory Tract Disease in the Mojave Desert Tortoise***Kendra Leonard, Biology***3A: Panel Presentation**

11:10–12:20 PM

HSB 108

MODERATOR: *Bruce Lundberg***Experiential Education 101: A Journey that Leads to a Better Future for College Students***Keragan Ettelman, English, Ricardo Octavio, Business Management, David Sanchez, English, Hayley Pantleo, English***3B: Oral Presentations**

11:10–12:20 PM

HSB 113

MODERATOR: *Carla Howard***Emergent reversal of warfarin in geriatric patients with intracranial hemorrhage***Amanda Spaak, Adult/Gerontology Acute Care/Family Nurse Practitioner***Ketofol (Ketamine and Propofol) Versus Propofol Alone During Procedural Sedation***Kaitlin Veselicky, Adult/Gerontology Acute Care/Family Nurse Practitioner***Curcumin and Alzheimer's Disease***Alexis Lichvar, Adult/Gerontology Acute Care/Family Nurse Practitioner***3C: Oral Presentations**

11:10–12:20 PM

HSB 122

MODERATOR: *Claudia Imes***Endovascular Thrombectomy vs Tissue Plasminogen Activator for Acute Ischemic Stroke***Amy Millsap, Adult/Gerontology Acute Care/Family Nurse Practitioner***Venous Thromboembolism Prophylaxis***Kim Huynh, Adult/Gerontology Acute Care/Family Nurse Practitioner***Ambient Air Versus Adjunct Oxygen in Normoxic ST-Elevation Myocardial Infarction***Abigail Saldua, Adult/Gerontology Acute Care Nurse Practitioner***Keynote**

12:30–1:30 PM

Hoag Hall

Audrey Lundahl will explore how her undergraduate research, including her work on a special issue for the CSU-Pueblo Today on the topic of racism after the first election of Barack Obama, developed in her a passion for social justice work. A community-based and active undergraduate experience at CSU-Pueblo helped her extend this passion for social justice into future research on intersecting issues of social injustice, including a Master's thesis and dissertation that centralized the work of women of color feminist/womanist theories. She will discuss how a foundation in writing, research, and diversity has helped her current work as an educator and scholar. Her current research includes a book-length project that explores how viewing home gardening as a spiritual practice using a decolonizing analysis can help us work toward food justice.

Objectives:

- Show how a focus on social justice can lead to a more meaningful career
- Offer a series of strategies that can assist college students in achieving academic and vocational success
- Emphasize the importance of diversity in undergraduate education

Dr. Audrey Lundahl is a Visiting Assistant Professor of Multicultural Women's and Gender Studies at Texas Woman's University, where she also received her PhD. Her dissertation project in multicultural woman's and gender studies, currently in development as a book, focused on home gardening and its potential for food justice. Her research on Ecofeminist spirituality has been previously published in the edited collection *Mothers and Food* (Demeter Press), *The International Review of Social Research*, and *Sacred Matters*. She teaches courses in Ecofeminism, Spiritual Activism, and Gender and Social Change.

Art Show

1:30–2:30 PM

Art Gallery

MODERATOR: *Caroline Peters***4A: Oral Presentations**

1:40–2:50 PM

HSB 108

MODERATOR: *Ebisa Wollega***Aging Out; An Overview of Aged Out Foster Youth in Colorado***Hannah Large*, Social Work and Honors**Live Healthier, Happier, and Longer: An Overview of Research on Benefits of Communication***J. Paul Bizzell*, Communication**4B: Oral Presentations**

1:40–2:50 PM

HSB 113

MODERATOR: *JP Purswell***Screening for Osteoporosis in Men***Bethany Caton*, Adult/Gerontology Acute Care/Family Nurse Practitioner**A Heuristic-Based Review of the Usability of the OSHA Website with respect to Communication Tower Hazards***Aiman Al-Allaq*, Engineering/Mechatronics**A Heuristic-Based Review of the Usability of the OSHA Website with respect to Radiation Hazards***Joseph Vigil*, Industrial Engineering**4C: Oral Presentations**

1:40–2:50 PM

HSB 122

MODERATOR: *Jacinda Heintzelman***Timing of PEG tube placement and nutritional status in head and neck cancer***Andrea Good*, Adult/Gerontology Acute Care/Family Nurse Practitioner**N.A.S.H.***Christine Bohannon*, Adult/Gerontology Acute Care/Family Nurse Practitioner**A New Approach to an Old Problem: Proprotein Convertase Subtilisin Kexin 9 Inhibitors***Jamison Lester*, Adult/Gerontology Acute Care/Family Nurse Practitioner**4D: Oral Presentations**

1:40–2:50 PM

LARC 109

MODERATOR: *Leonardo Bedoya***The Effects of Political Rhetoric on Refugee Policy and Communities in the United States and Germany***Eliana Taylor*, Political Science and Honors**The Economic Destruction of Stalin's Gulag***Dawn Carver*, History**The Reactions and Changes in Attitudes to Different Types of Political Advertisements***Mikala Morris*, Mass Communications (Integrated Communications), Political Science and Spanish**4E: Poster Presentations**

1:40–3:30 PM

HSB 110

MODERATOR: *Susan Belpert***Septic Protocol Use vs Non-Use of Septic Protocol Effects on Mortality***Dalia Holguin*, Nursing, *Aubrey Urban*, Nursing, *Daniel Kyle*, Nursing, *Melissa Navarrette*, Nursing, *Heather Fortner*, Nursing, *Heather Templeton*, Nursing, *Shatiya Wright*, Nursing**Does mobilizing ventilated patients lead to better patient outcomes than waiting until extubation to mobilize?***Tami Jo Hentschelmann*, Nursing, *Travis Ford*, Nursing, *Laura Prieditis*, Nursing, *Mandy Smith*, Nursing, *Phainis Onyango*, Nursing, *Carisa Medina*, Nursing, *Cherry Evans*, Nursing**Cannabis: An Effective Alternative for Managing Chronic Pain***Justina Gonzales*, Nursing, *Ofelia Sifuentes*, Nursing, *Roy Cerda*, Nursing, *George Miller*, Nursing, *Carly Rey-Hayes*, Nursing, *Alyssa Wyberg*, Nursing, *Kelly Zandbergen*, Nursing**First Time NCLEX Success***Stevi Krier*, Nursing, *Hallie Greene*, Nursing, *Kayleigh Guadagnoli*, Nursing, *Kelly Johnson*, Nursing, *Kaleb Hansen*, Nursing, *Kaela Becker*, Nursing, *Kaitlin Crowley*, Nursing**Transdermal Aromatherapy: An Emerging Solution to Chronic Pain Management***Jessica Eaton*, Nursing, *Dora Agyeman*, Nursing, *Huria Tossa*, Nursing, *Geoffrey Kipkoech*, Nursing, *Leah Bost*, Nursing, *Bryli Klipfel*, Nursing, *Isabel Taylor*, Nursing**Influenza Vaccine: live attenuated immunization versus inactivated immunization***Tristan Strickland*, Nursing, *Mike Williams*, Nursing, *Alli Wurscher*, Nursing, *Lexi Latika*, Nursing, *Eryn Salinas*, Nursing, *Kaylie Margison*, Nursing, *Ashlee Hanavan*, Nursing**A Review of the Effectiveness of Needle Exchange Programs in Decreasing the Incidence of HIV Transmission Within Studied Populations***Matthew Leberknight*, Nursing, *Caitlin Weaver*, Nursing, *Sabaja Lobith*, Nursing, *Kelly McLean*, Nursing, *Rebecca Ketchum*, Nursing, *Janine Dillaha*, Nursing, *Daniel Townzen*, Nursing**Under Pressure: The Use of Pressure Relieving Mattresses***Leslie Roberts*, Nursing, *Aubrienne Lewellen*, Nursing, *Shannon Pedzinski*, Nursing, *Rose McMurphy*, Nursing, *Lisa Muff*, Nursing, *Savannah Nicks*, Nursing, *Curtis Bennett*, Nursing**Robotic or redundant: a comparison study review of the da Vinci Surgical System and standard laparoscopic procedures***Kelly Bekeris*, Nursing, *Sharice Jones*, Nursing, *Noemi Miller*, Nursing, *Taylor Engle*, Nursing, *Josh True*, Nursing, *Lauren Leopold*, Nursing, *Jesslyn Liwanag*, Nursing**COPD and Telehealth***Jennifer Slane*, Nursing, *Ryan Parnes*, Nursing, *Anabi Najjar Madera*, Nursing, *Samson Mutua*, Nursing, *Roberto Chacon*, Nursing, *Angelina Mungia*, Nursing, *Michael Sage*, Nursing**Put A Cap On It!***Renee E. Gribble*, Nursing, *Heather J. Knox*, Nursing, *Hui Jeong Kim*, Nursing, *Karla M. Dunston*, Nursing, *Kayla D. Smith*, Nursing, *Danielle M. Miller*, Nursing, *Samantha A. Geisick*, Nursing

Shorter Shifts or Longer Weekends

Darian Horvat, Nursing, *Ashley Richardson*, Nursing, *Mercedes Trujillo*, Nursing, *Bryanna Houser*, Nursing, *McKenzie Pacheco*, Nursing, *Brittany Guerro*, Nursing, *Jalissa Peterson*, Nursing

4F: Poster Presentations

1:40–3:30 PM

HSB 111

MODERATOR: *Lisa Gray***Identifying and Treating Hypopituitarism Secondary to TBI**

Stacey G. Stancill, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Heather Lollar*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Stacy Derrera*, Adult/Gerontology Acute Care/Family Nurse Practitioner, *Vanessa Gallant*, Adult/Gerontology Acute Care/Family Nurse Practitioner

Ungentlemanly Heroes: The story of British clandestine operatives, and how they turned the tide of World War II

Jacob Cibulka, History

The Disintegration of Yugoslavia: Croatia's Quest for Independence

Albert L. Marshall, History

Vision-based path planning and control of a mobile robot

D. Mike Daniel, Mechatronics

CBASE & Co-Create Community Collaboration Project

Shamel David, Psychology, *Raquel Marquez*, Biology, *April Conchola*, Biology, *Hassan Abdulkareem*, Engineering, *Shion Ienaga*, Biology

4G: Poster Presentations

1:40–3:30 PM

LARC 108

MODERATOR: *Betsy Schippers***Octocopter Applications**

Roberto Chacon, Mechatronics, *Anthony Mercado*, Mechatronics

Urbanization in Renaissance Italy and the development of technology and trade networks

Garret Brooke, History, Secondary Education emphasis

Elizabeth I: A Queen Among Queens

Shayana Dabney, Political Science

Lucrezia Tornabuoni, Influential Mother: How Feminism Shaped the Early Renaissance

Darek Thomas Sr., Political Science/ English (Creative Writing)

Great Britain's Reign

Alexandra Kelley, English and History

Isabella I of Castile's Influence on Spanish Government as Queen

Jasmine Lopez, History

Improvements in Inexpensive Metal 3D Printing Processes

Miguel A. Galaviz, Mechatronics

Study of Robotic End-Effectors

James Steele, Mechatronics

5A: Oral Presentations

3:00–4:10 PM

HSB 108

MODERATOR: *Jane Fraser***Linear Optimization Program of Sudoku Game**

Dustin Clasby, M.S. Industrial and Systems Engineering

Picture This: Applying Visual Ethnography in an Experiential Education Environment

Samantha Patterson, English

5B: Oral Presentations

3:00–4:10 PM

HSB 113

MODERATOR: *Carla Howard***Noninvasive Ventilation in Amyotrophic Lateral Sclerosis**

Elizabeth Jason Gillespie, Adult/Gerontology Acute Care/Family Nurse Practitioner

Using Azacitidine for the Treatment of Myelodysplastic Syndromes

Rebecca Penkoff, Adult/Gerontology Acute Care/Family Nurse Practitioner

Alpha-1 Antitrypsin Deficiency

Natalie Zufall, Adult/Gerontology Acute Care/Family Nurse Practitioner

5C: Oral Presentations

3:00–4:10 PM

HSB 122

MODERATOR: *Jacinda Heintzelman***Do Probiotics Decrease Antibiotic Associated Diarrhea?**

Rebecka Reatherford, Adult/Gerontology Acute Care Nurse Practitioner

Acute Otitis Media In Children

Jennifer Berrier, Adult/Gerontology Acute Care/Family Nurse Practitioner

Treatment of Pain in Pediatric Acute Otitis Media

Kindra LeDuc, Adult/Gerontology Acute Care/Family Nurse Practitioner

5D: Oral Presentations

3:00–4:10 PM

LARC 109

MODERATOR: *Margie Massey***Athens' Namesake: the Connection Between the City-State's Lifestyle and Religion**

Jasmine Watson, Psychology and History

Why the Soft Collapse of the Soviet Union created Modern Europe

Gerard Lee Ostrander, Political Science

Abstracts

1A: Seizure prophylaxis in TBI

Christy Peters, Adult/Gerontology Acute Care Nurse Practitioner (Ft. Collins, CO)

The topic of this presentation is seizure prophylaxis in traumatic brain injured patients. The PICOT question explored is in patients over the age of 16 with traumatic brain injury what is the effect of prophylactic Phenytoin use compared to no prophylactic Phenytoin use on complications over the first seven days post injury. The eligibility criteria included being over the age of 16 and Glasgow coma scale of 3-8. The research design is translational research using a literature review design in accordance with NIH's protecting human research participants certification. The Brain Trauma Foundation guidelines and research demonstrate that prophylaxis with Phenytoin is beneficial in patients with traumatic brain injury seven days post injury. Limitations of the studies include research is over twenty years old and newer medications are available for use with less side effects that need to be researched.

Keywords: Seizure prophylaxis, Traumatic brain injury

1A: Nonepileptic Seizures

Christina Steinmetz, Adult/Gerontology Acute Care/Family Nurse Practitioner (Littleton, CO)

Psychogenic nonepileptic seizures (PNES) are similar to epileptic seizures (ES) in their presentation as paroxysmal time-limited, alterations in motor, sensory, autonomic, and/or cognitive signs and symptoms. They present as involuntary behaviors, sensations, or movements that have psychological causes, and are not caused by ictal epileptiform discharges. The symptoms are psychiatric in origin but neurologic in appearance. The condition is not well understood by clinicians, and patients are often misdiagnosed with ES, and suffer increased morbidity from inappropriate treatments. In the United States (U.S.), of the 1% population diagnosed with epilepsy, 5-20% have PNES. The yearly cost of patients who have medically unexplained symptoms in the U.S. is approximately \$256 billion per year, with PNES the largest subgroup of functional neurologic disorders responsible for a large portion of expenses estimated at about \$900 million per year. The prevalence of PNES is from two to 33 cases per 100,000, and 75-85% of patients are women. Early diagnosis is crucial yet the mean time to diagnosis is 7.2 years. Proper understanding and correct diagnoses are needed to correctly treat patients, but barriers exist in lack of provider training, and no current nationally recognized guidelines of care due to lack of funding for larger, controlled trials. *Abstract Methods:* Reviews of published meta-analyses, systematic review of literature via databases CINAHL, PubMed, Cochrane. Current practice guides from American Academy of Family Practice and International League Against Epilepsy were used to compare and evaluate the literature recommendations for best practice. NIH training and certification completed. *Research Design:* Translational research using a literature review design.

Keywords: psychogenic, movement disorder, adult, non-epileptic seizure, genetics, conversion disorder, DSM V, seizure, pseudoseizure, hysterical, functional, dissociation, attitudes

1A: Pharmacological vs. Surgical treatment of CTEPH

Lindsey Bollinger, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

It is estimated that up to 10,000 patients with a pulmonary embolism will develop chronic thromboembolic pulmonary hypertension (CTEPH) in the United States each year. Researchers believe that due to nonspecific symptoms, CTEPH is underdiagnosed and often misdiagnosed as another disease. The aim is to evaluate and compare the evidence and research regarding pharmacological treatment in comparison to surgical pulmonary thromboendarterectomy in patients diagnosed with CTEPH. Translational research using a literature review design was conducted on current practice guidelines as well as multiple randomized controlled trials to evaluate the evidence and find the best possible patient outcomes. This author has completed the NIH training with active certifications. CTEPH patients treated with surgical pulmonary thromboendarterectomy have better resolution of pulmonary embolisms than those deemed inoperable and treated with medical therapy.

Keywords: chronic thromboembolic pulmonary hypertension (CTEPH), pulmonary endarterectomy, Inoperable chronic thromboembolic pulmonary hypertension

1B: The Watchman Device an Alternative in Stroke Prevention for Individuals with Atrial Fibrillation

Leah Ruch, Adult/Gerontology Acute Care/Family Nurse Practitioner (Englewood, CO)

Aim: To compare the Watchman device versus warfarin therapy in prevention of stroke in a patient with atrial fibrillation (AF) over a five-year time period. Background: Stroke is the fifth leading cause of death and the leading cause of disability in the United States. AF accounts for 10% of all ischemic strokes due to thrombo-emboli, 90% of which form within the left atrial appendage of the heart. Warfarin is the gold standard in stroke prevention for those with AF, yet 40% of individuals are not taking anticoagulant therapy, alternative options are necessary. *Theory:* Dorothea Orem's Self-care Deficit Theory was used to determine the best treatment choice for the individual in the case study. *Methods used:* Translational research processing using literature review design with key search terms: Watchman Device, and left atrial appendage occlusion device. *Research Database utilized:* PubMed and Clinical Key. Research articles included randomized control & meta-analysis studies. Researcher holds an active NIH certification. *Results:* The total number of strokes between use of warfarin compared to the Watchman device were found to be statistically similar over a five-year period of time ($p=0.94$), therefore find the Watchman device to be non-inferior to warfarin in the prevention of stroke in those with atrial fibrillation. *Implications:* The Watchman device was found to be a good alternative to warfarin therapy in prevention of stroke in those with AF over a five-year time period.

1B: Glucagon-Like Peptide-1 (GLP-1) Receptor Agonists & Metformin in Prediabetes

Daniel E. Marquez, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

To examine how much glucagon-like peptide 1 (GLP-1) receptor agonists such as exenatide reduce Hemoglobin A1c (HbA1c) compared to metformin (Glucophage) in patients with prediabetes. The prevalence of DM II and prediabetes is astonishing, according to the Centers for Disease Control and Prevention (CDC), 84.1 million peo-

ple in the U.S. have prediabetes. Even though the U.S. Food and Drug Administration (FDA) has not approved pharmacological agents for treatment of prediabetes, literature reports that pharmacologic agents, including metformin, and GLP-1 agonists, have shown to decrease the development of DM II. To discover whether GLP-1 agonists lower HgA1c more than metformin, translational research using a literature review design was performed. After obtaining the NIH clinical research certificate, research was collected using CINAHL, PubMed, and Google Scholar applying the terms incretin, glucagon-like peptide 1, GLP-1, exenatide, metformin, and prediabetes. Relevant articles discussing the use of GLP-1 receptor agonists and metformin for the treatment of prediabetes were used. Further targeted searches were conducted on prediabetes treatment guidelines as well as the American Diabetes Association (ADA) treatment recommendations. There were significant differences according to mean HbA1c values. GLP-1 agonists show efficacy that is equal to or greater than metformin for the treatment of prediabetes. GLP-1 agonists have also been shown to have advantages that prediabetics can benefit from, such as weight loss, potential beta-cell protection, and low risk of hypoglycemia. The searched literature supports the use of GLP-1 agonists over metformin to reduce HbA1c but does not take into consideration cost effectiveness, or long-term safety.

Keywords: incretin, glucagon-like peptide 1, GLP-1, exenatide, metformin, and prediabetes

1B: Ketogenic Diet: Benefits in Type 2 Diabetes

Amanda Hrycaj, Adult/Gerontology Acute Care/Family Nurse Practitioner (Sterling, CO)

Background: Approximately 9.3% of Americans have a diagnosis of diabetes. Of those diagnosed with diabetes, 90% are type 2 diabetics. Americans now have a 40% chance of developing diabetes in their lifetime. Unfortunately, diabetes accompanies many serious comorbidities and ultimately an overall decreased life expectancy. **Objective:** The current American diabetes Association (ADA) guidelines supports the “create your plate” diet method, however a ketogenic diet, or a diet that consists primarily of fat and protein with few carbs is showing to be very beneficial in improving glycemic control, reducing HbA1C, weight loss, decreasing need for medications & improving cardiovascular risk factors amongst type 2 diabetics. **Methods:** Research was conducted via translational research using a literature review design to review the effectiveness of a ketogenic diet on improving glycemic control. Many studies reviewed involved implementation of the ketogenic diet compared to a Low glycemic diet or reduced calorie diet. The studies varied in length from three weeks to over a year. The population was restricted to adults diagnosed with type 2 diabetes. In preparation for this research, NIH training was completed with current certifications. **Results:** Overall, results showed favor toward a ketogenic diet in regard to diabetes management. All studies examined, demonstrated a decrease in fasting glucose, weight loss, & improved HbA1c levels. Some studies reported additional benefits such as decreased triglycerides. **Conclusions:** Although controversial to the recommended diet by the ADA, the ketogenic diet poses a good option for more effective management of diabetes and can lead to overall improved glycemic control.

1C: Concomitant use of Tobacco and Marijuana: A Fast Track to COPD?

Karla Richardson-Trujillo, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Chronic Obstructive Pulmonary Disease (COPD) is a chronic inflammatory lung disease characterized by progressive obstruction of airflow from the lungs and is currently the fourth leading cause of death in the world (GOLD, 2017, p. 19). The main risk factor for COPD is smoking tobacco. (Epocrates, 2017). Research has shown that tobacco smokers are seven times more likely to use marijuana than non-smokers (Goodwin, et al., 2018).

The design of this study was a translational research using a literature review to assess the possible increased risk of COPD among concomitant smokers of tobacco and marijuana. The author, who has completed NIH training with active certifications, set out to investigate available evidence-based literature concerning the following research question: In patients older than 18 years of age (P), does concomitant smoking of tobacco and cannabis decrease lung function as measured by FEV1/FVC ratio in spirometry (I) compared with those that only smoke tobacco (C) thus increasing the risk of COPD (O) ?

1C: Treatment of High Altitude Pulmonary Edema (HAPE) with Nifedipine

Kimberly Jones, Adult/Gerontology Acute Care/Family Nurse Practitioner (Denver, CO)

Background: High altitude pulmonary edema (HAPE) is a serious condition that can develop after a rapid ascent to an altitude above 8000 feet. Symptoms usually begin within 2-4 days of ascent and include shortness of breath, first with exertion and then at rest, tachypnea, tachycardia, dizziness, productive cough, and hypoxia. Prompt and reliable treatment is important to prevent hypoxemia, long-term disability, and possibly death in adults who develop these symptoms. Nifedipine is a calcium channel blocker that has been shown to reduce the symptoms of HAPE. **Purpose:** A brief literature review and examination of the latest clinical practice guidelines were conducted with a focus on the effectiveness of nifedipine in the reduction of symptoms of HAPE in adults who rapidly ascended to altitude over 8,000 feet. **Methods:** A translational research process using literature reviewed in PubMed, Google Scholar, and UpToDate was instituted. All required NIH modules were completed. **Results:** A single, nonrandomized, unblinded study of 6 patients located in a laboratory at 4559 meters (14,957 feet) found a statistically significant reduction in the symptoms of HAPE when 30mg nifedipine was taken twice a day for five days. **Implications:** While only a single research study showed the benefits of nifedipine in the treatment of HAPE, successful and extensive field usage of the drug has resulted in the latest clinical guidelines to recommend nifedipine as a Class 1C when oxygen is unavailable and descent from altitude cannot immediately occur.

1C: Utilization of High-Flow Nasal Cannula in the Prevention of Intubation in Patients with Chronic Obstructive Pulmonary Disease

Amber Doss, Adult/Gerontology Acute Care Nurse Practitioner (Pueblo, CO)

Background: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death in the United States. Should a patient require intubation for a COPD exacerbation, their risk of mortality

increases by 15 times that of a person not experiencing respiratory failure. **Methods:** The author, who has completed the NIH training and has active certification, performed translational research utilizing a literature review design. The goal was to determine how high flow nasal cannula (HFNC) compares to non-invasive ventilation (BiPap) in preventing mechanical ventilation in patients with COPD who are experiencing acute hypoxic respiratory failure. **Results:** Twenty-three trials were utilized in this literature review. Nine of these trials determined that HFNC provided a decreased chance of intubation for the patient in acute respiratory failure (ARF). The other 14 trials concluded that there was no clinical difference between the two interventions. **Conclusions:** In COPD patients who are unable to tolerate wearing the cumbersome mask of a Bipap machine during acute respiratory failure, HFNC is just as effective at preventing intubation.

1D: Tranexamic Acid and Mortality Rates in Mass Transfusion Protocols

Cassie McCullough, Adult/Gerontology Acute Care/Family Nurse Practitioner (Lakewood, CO), *Kathy Michael*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Littleton, CO), *Brandis Montez*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Trauma is one of the leading causes of death worldwide. When trauma and blood loss occur, hemostasis causes the bleeding to stop. When severe blood loss occurs, coagulation is disturbed and outside intervention is required. How this is treated is critical to patients' survival. The CRASH-2 clinical study brought the use of Tranexamic Acid (TXA) within mass transfusion protocols to the forefront in treating and decreasing mortality of hemorrhagic trauma patients. The study was a randomized, placebo-controlled trial. It received a B recommendation which is the net result of moderate to substantial evidence. The CRASH-2 trial results were positive and mortality rate decreased by 10%. These results should be provided to those working in the hospital ER setting. This protocol has been used in the British and American Army trauma protocols and used by ambulances in the UK. The purpose of this study was to look at the benefits of tranexamic acid use within the first three hours of traumatic injury and if it should be used in mass transfusion protocols within the hospital setting. The weaknesses of this study as it pertains to the protocol are lack of follow up with the patients, the severity of injury is not discussed and the bias of those who receive versus not is not released.

Keywords: *tranexamic acid, mass transfusion protocol, hemorrhage, mortality*

1D: Electrophilic Fluorination of Aromatics: Developing New Experiments for the Undergraduate Organic Chemistry Laboratory

Mikelah Suzuki, Chemistry (Pueblo, CO), *Kelly Sheehan*, Chemistry (Pueblo, CO), *Alejandro Otero*, Chemistry (Pueblo, CO), *Jade Garcia*, Undeclared - high school student (Pueblo, CO)

While electrophilic reactions, including electrophilic aromatic substitutions, are common undergraduate organic laboratory experiments, the use of fluorine as the electrophile in the undergraduate laboratory has not been studied because of safety issues involving typical fluorine sources. To incorporate this interesting and somewhat unexpected reaction (electrophilic fluorine???) into the undergraduate curriculum, we have explored the reactions of electrophilic fluorine with several substrates, using F-TEDA, SelectfluorTM, as the electrophilic

fluorine donor. The reaction of acetanilides (4-R-PhNHCOCH₃; R=H, 4-CH₃, and 4-Br) and anisole (PhOCH₃) with F-TEDA gave the products of electrophilic aromatic substitution with fluorine. The use of both traditional reflux (hot plate) and microwave techniques were used for these reactions.

1D: The Impact of Developmental Lead (Pb2+) Exposure on a Model System, *Drosophila pseudoobscura*

Hugh Long, Biology (Fountain, CO), *Dr. Elizabeth K. Peterson*, alumni (Colorado Springs, CO), *Tyler Harvey*, Biology (Las Vegas, NV)

Lead (Pb2+) contamination is widespread throughout the environment, therefore, humans are still at risk for exposure to Pb2+. Low doses of Pb2+ can have severe impacts on behavior, such as cognition, intelligence, and hyperactivity. In addition, studies have shown a correlation between developmental Pb2+ exposure and juvenile delinquency and violent crime. However, these studies were unable to show a causal relationship between Pb2+ exposure and aggression. The overall aim of this research project is to determine the effect of developmental exposure of Pb2+ on aggression using *Drosophila* as a model system. To accomplish this, the specific aims of this project are to: 1) determine the most preferable bait to collect wild populations of flies; 2) collect genetically-variable field populations of local species *Drosophila pseudoobscura*; 3) quantify aggressive behaviors in *D. pseudoobscura*; 4) determine a sub-lethal exposure to test aggression using a dose response curve; and 5) determine if developmental Pb2+ exposure increases aggression at a sub-lethal dose. We found that wild populations of *Drosophila* prefer bait consisting of defrosted frozen banana (p < 0.05); however, baits consisting of defrosted frozen banana, yeast slurry, and tomato were the most successful at attracting the most diverse species of *Drosophila*. We spent the summer field season of 2017 collecting wild genetically-variable populations of *D. pseudoobscura* throughout central and southern CO. Currently, we are examining aggressive and territorial behaviors in both male and female *D. pseudoobscura*.

1D: Synthesis of Carboxyhydro-1,2,4,5-Tetrazines and Tetrazines for Polymerization to Polyesters

Cassandra Perlick, Biology (Long Beach, CA), *Andrew Shannon*, Chemistry (Pueblo, CO)

The goal of this project is to synthesize a series of 3,6-diaryltetrazines and to convert them into tetrazine polyesters, a new class of polymeric materials. Two carboxyphenyl tetrazines (3-carboxyphenyl and 4-carboxyphenyl) were synthesized via the oxidation of the corresponding dihydrotetrazines (DHTZ). The DHTZ compounds were synthesized from aryl nitriles and hydrazine. A variety of conditions were explored to maximize yields of the DHTZ compounds. Conditions for the oxidation were similarly explored. The DHTZs and tetrazines were characterized by IR spectroscopy. The bis-carboxyphenyl tetrazines were converted to acid chlorides using thionyl chloride (SOCl₂) and these were then converted to esters by reaction with selected diols. The simple ethyl esters have been prepared as well as the first two of a series of new tetrazine polyesters. These initial polymers were generated from ethylene glycol and 1,4-butanediol. IR spectroscopy confirms the success of these reactions. Attempts to prepare tetrazines from 4-cyanophenol and 4-chlorobenzonitrile were less successful so the syntheses and approaches to polymers from these materials were suspended.

1D: Surface Based Molecular Sensor for Naked Eye Cyanide Detection

Cameron Collins, Biology (Pueblo, CO), Sean Love, Biology (Pueblo, CO)

Cyanide (CN⁻) is an extremely toxic anion and only a small amount is fatal for a living being. Our goal is to use 3D metal complexes to sense cyanide using colorimetric techniques. Which could be more cost effective and environmentally friendly compared to similar organic sensors and techniques. Our research synthesized multiple Co(II)-bis-terpyridine complexes that can be used for the naked-eye detection of CN⁻ in aqueous solution in 10⁻⁶ M level.[1] The terpy compound, [4'-(4-carboxyphenyl)-2,2':6',2'']-terpyridine, COOH ligand was reacted with SOCl₂ to chlorinate the carboxylic acid allowing the ligand to attach to the surface of cellulose paper. A 3D metal complex was formed with CoNO₃ and COOMe, [4'-(4-Methoxycarbonylphenyl)-2,2':6',2'']-terpyridine, ligand. Surface attachment was done in both water and methanol solutions. Both reactions showed visible color change when the 3D metal complex was synthesized on the cellulose paper. Both papers showed a visible color change when added to a 10⁻⁵ KCN solution. IR characterization verified a nitrile peak after papers were placed in cyanide solution.

1D: Increasing Efficiency of Ethanol Production from Crude Glycerol and *Enterobacter aerogenes*

Amanda Mayes, Chemistry (Pueblo, CO)

With global energy consumption consistently on the rise, there is a need to match supply to demand using alternative energy sources. Current energy sources rely heavily on fossil fuels; however, their emissions have been implicated in environmental and health issues. National and global policies have been implemented in an effort to reduce fossil fuel emissions and promote alternative energy sources. One of the more well-known alternative energy sources is biodiesel. Biodiesel is typically manufactured from seed oils or from waste vegetable oil by base-promoted transesterification using methanol or ethanol. Production of biodiesel is accompanied by 10% of glycerol by-product. With increasing production of biodiesel, the industrial market for crude glycerol has all but evaporated. Costs associated with crude glycerol disposal contribute to an increased cost to the consumer adversely affecting the market competitiveness of biodiesel with fossil fuels. To decrease crude glycerol disposal costs, current research has focused on finding new uses for crude glycerol including conversion to value-added products. In our work, we have used *Enterobacter aerogenes*, a facultative, anaerobic bacterium that is known to ferment crude glycerol yielding ethanol as one of its metabolic products. Ethanol produced in this way can be used directly as an alternative energy source, blended into fossil fuels, or put back into the biodiesel production process replacing or supplementing the methanol in the transesterification, thus lowering the cost of biodiesel in the energy marketplace. In our work, we use a chemostat to induce selective pressure on the growth and reproduction of *E. aerogenes* in a diluted glycerol/nutrient mixture. We present NIR and GC results that show feasibility of conversion of glycerol to ethanol using *E. aerogenes*.

1D: Polish-Lithuanian Constitution of 1791

Christian Montes, History (Colorado Springs, CO)

The Polish-Lithuanian Commonwealth was formed in 1569 and lasted over two centuries until its demise in 1795. It was situated between today's Russia and Germany. On May 5, 1791 the common-

wealth drafted and ratified what can be argued as the second oldest constitution in world history. To Europe, this democratic constitution is the first of its kind on the European continent. The Polish-Lithuanian constitution seems to draw influence from the United States constitution (ratified just 4 years earlier) but does not entirely mimic its ideology. Lasting for only fourteen months, the constitution was lost in Polish history for over a century until it became a symbol of democracy, liberty, and freedom when Poland gained its independence in 1918. The constitution still exists as a symbol in Polish culture today as May 5th serves as its most celebrated holiday. Among the display of early nationalism, the constitution also embodies ideas of liberty, freedom, and democracy. Ideas not yet prominent in Europe during the late 18th and early 19th centuries.

1D: Use of 3D ordered macroporous metal oxides intercalated with MoS₂ for efficient hydrogen-evolving reaction

Daniel Conroy, Chemistry and Biology (Fountain, CO)

Differing nanostructures have been shown to alter the efficiency of both chemical catalysis and light absorption. Applying this principle to an inverse opal 3D ordered macroporous (3DOM) semiconductor containing MoS₂ nanoparticles has the potential to generate a photocatalytic nanomaterial for the hydrogen-evolving reaction (HER) and other reactions that occur at a reduction potential close to 0 eV. Cuprous oxide is a strong light sensitizer and has already been shown to improve the catalytic efficiency of a variety of reactions when generated as a nanomaterial. Ferric oxide similarly has a bulk bandgap within the visible range. In this work, a method for generating a novel metal oxide 3DOM with MoS₂ nanoparticles adsorbed to pores is proposed as well as methods for optimization and testing. Differing polymeric templates would be generated and imbibed with differing metal ion solutions which convert to a metal oxide when calcined. Changes in the template and semiconductor have the potential to improve catalytic efficiency. This work will report on the effectiveness of these optimization techniques on catalysis and the morphology impacts of template manipulations.

1D: Incendiary Memories: the Legacies of the Dresden Firebombing

Abigail Seman, History (Dunbar, PA)

In February of 1945, Allied forces bombarded the German city of Dresden with at least 2,500 pounds of incendiary explosives. Dresden was neither the first nor the last German city to be targeted, nor was it the most devastating of the Allied air raids. Yet the bombing of Dresden rose in the annals of history as uniquely cruel; Dresden was a city of questionable military relevance, profound cultural import to Germans, and contained thousands of refugees and civilians. Historians have explored Dresden's military importance, contested casualty rate, and cultural heritage, as well as the rebuilding of its monuments. Investigations into the ethical justification of the Allied bombings are plentiful, yet controversial. An area oft neglected in the evaluation of the Dresden bombing is the diverse, powerful, and divisive historical memory of the event, and how an understanding of the various constructions of Dresden's history can aid in a more complete comprehension of World War Two and its ever present consequences. Many Germans consider the bombing of Dresden to be not only an affront to human dignity, but to the rich cultural history of Germany. Others speak of Allied barbarism, and refer to Dresden as the "worst massacre in the history of the world," while still more argue that those who

commemorate Dresden are directly ignoring the transgressions of Nazi Germany by indulging in self-pity and romanticism. British prisoners of war tell of lifelong trauma as a result of witnessing Dresden's fires, yet many British bombers speak of Dresden without remorse. By examining the testimonies of Dresden survivors, the arguments of British and German historians and activists, and the contentious commemorations in contemporary Dresden, this research seeks to provide insight into the tumultuous post-war culture of Europe, and the powerful impacts of nationalism.

1D: Acoustic Sensor Design for Concrete Bridge Deck Inspection

Julian Fierro III, Mechatronics (Pueblo, CO)

Nondestructive evaluation (NDE) technology is commonly used to inspect and/or monitor our aging infrastructure to provide engineers and bridge owners critical data for effectively manage and prioritize their funding. For bridge deck, collected NDE data also helps to build the deterioration model and estimate their life-cycle costs. In this paper, we build an acoustic sensor array and develop algorithms to collect and analyze the Impact Echo (IE) and Ultrasound Surface Wave (USW) signals from concrete bridge decks or concrete slabs. IE signal can be used to detect the defects in concrete, primarily delamination. The layer thickness and elastic moduli of the concrete deck/slab can be obtained from the USW dispersion curve.

1D: Study of Memristors for AI Applications: Modeling, Characterizations, and Applications

Jonathan Hannan, Mechatronics (Pueblo, CO)

Memristor is a non-linear passive two-terminal electrical component that can be characterized as the fourth basic element in integrated circuits, besides the three well-known: resistor, capacitor, and inductor. It has the ability to retain a previous resistive state without the present of the power supply. In this work, a modeling of memristors is performed using COMSOL software package. Experiments are performed with a commercially developed memristor kit. Artificial intelligence applications of memristors are explored.

1D: The Effectiveness of Medications versus Exercise for the Diagnosis of Depression

Aimee Harmon, Nursing (Colorado Springs, CO), *Alexandra Garst*, Nursing (Saint Petersburg, FL), *Sierra Darling*, Nursing (Cortland, NY)

Purpose: The purpose of this translational study was to determine the effectiveness of the different treatment modalities for Depression. **Background & Significance:** Different treatment modalities can be used to treat the imbalance of neurotransmitters seen in Depression including medications and exercise. Regardless, the overall goal is to improve and strengthen the communication between the nerve cells, thus regulating mood instability. The observations suggest the hypothesis that exercise is a comparable treatment to medications in the diagnosis Depression. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases used were CINAHL, Medline Plus, and PubMed. **Findings:** Patients from both treatment modalities self-reported an increase in their mood. However,

patients in both treatment modalities still reported having slight Depressive symptoms. It was found that patients who used only medications had faster improvement than patients who only used exercise. **Conclusion:** Therefore, this study revealed that the best outcome for patients with Depression is a combination therapy in which they are placed on medications to quickly achieve the higher levels of mood, and exercise as an adjuvant therapy to help maintain the increased mood.

1E: Septic Protocol Use vs Non-Use of Septic Protocol Effects on Mortality

Dalia Holguin, Nursing (Denver, CO), *Aubrey Urban*, Nursing (Denver, CO), *Daniel Kyle*, Nursing (Boise, ID), *Melissa Navarrette*, Nursing (Lamar, CO), *Heather Fortner*, Nursing (Colorado Springs, CO), *Heather Templeton*, Nursing (Colorado Springs, CO), *Shatiya Wright*, Nursing (Colorado Springs, CO)

Purpose: The purpose of this study was to evaluate current septic protocol use in acute care settings on septic patients in comparison to non-use/non-adherence of septic protocols and the effects on patient mortality rates. **Background & Significance:** Sepsis is a life-threatening condition on the rise that can result in death. Early recognition and care is critical. Since the first Surviving Sepsis Campaign guidelines were released septic protocols have been implemented in hospitals across the nation. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases searched were CINAHL, Medline, & PubMed using the keywords: Septic Shock; Sepsis; Surviving Sepsis Campaign, Sepsis protocol/bundle, Sepsis mortality rates. **Findings:** The literature review revealed severe sepsis/septic shock patients had better outcomes with adherence of septic protocols/bundles. **Conclusion:** Overall, the use of septic protocols/bundles does decrease the mortality of septic patients and they should be implemented in all hospitals nationwide.

Keywords: *Septic Shock; Sepsis; Surviving Sepsis Campaign; Sepsis protocol/bundle; Sepsis mortality rates*

1E: Does mobilizing ventilated patients lead to better patient outcomes than waiting until extubation to mobilize?

Tami Jo Hentschelmann, Nursing (Colorado Springs, CO), *Travis Ford*, Nursing (Colorado Springs, CO), *Laura Prieditis*, Nursing (Colorado Springs, CO), *Mandy Smith*, Nursing (Pueblo West, CO), *Phainis Onyango*, Nursing (Arlington, TX), *Carisa Medina*, Nursing (Mountainview, CA), *Cherry Evans*, Nursing (Colorado Springs, CO)

Purpose: The purpose of this study was to determine if mobilization of mechanically ventilated patients leads to improved outcomes. **Background/Significance:** Long term cognitive and physical impairments are common following admission to an Intensive Care environment, but early mobilization of ventilated patients may show a marked improvement in patient outcomes. **Design/method:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification.

This study does not include human subjects and is exempt from IRB approval. The following databases were used to find current research: CINAHL, Ovid Full-Text Nursing Plus, Google Scholar, Academic Search Premier, and Science Direct. **Findings:** The literature review showed that early intervention and mobilization of intubated patients leads to improved patient outcomes, including decreased length of stay (LOS), days spent intubated, and improved cognitive and physical functioning. This leads to dramatically decreased costs involved with overall delivery of care. **Conclusion:** This translational research study proved that mobilization of ventilated patients improved patient outcomes.

Keywords: critically ill, mechanically ventilated, ventilated, mobilization, early mobilization

1E: Cannabis: An Effective Alternative for Managing Chronic Pain

Justina Gonzales, Nursing (Pueblo, CO), Ofelia Sifuentes, Nursing (San Antonio, TX), Roy Cerda, Nursing (North Las Vegas, NV), George Miller, Nursing (Colorado Springs, CO), Carly Rey-Hayes, Nursing (Pueblo, CO), Alyssa Wyberg, Nursing (Fairfield, OH), Kelly Zandbergen, Nursing (Colorado Springs, CO)

Purpose: To examine and compare medical marijuana and opioids in treating patients experiencing chronic pain. **Background & Significance:** Currently, opioids are the go-to treatment for patients with chronic pain. Opioids are only effective in the short-term and carry with them adverse effects as well as potential for developing dependency. Medical marijuana is an effective, safer alternative that should be considered in treating chronic pain. **Design/method:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. **Databases:** The JAMA Network, PubMed, and CINAHL. **Findings:** Review of previous studies show that medical marijuana reduces chronic pain, improves quality of life, activity levels and concentration, and has fewer side effects. **Conclusion:** Medical marijuana has shown to be an effective, alternative treatment for chronic pain patients with less severe side effects than opioids.

Keywords: Medical marijuana, chronic pain, opioids, alternative treatment

1E: First Time NCLEX Success

Stevi Krier, Nursing (Strasburg, CO), Hallie Greene, Nursing (Aurora, CO), Kayleigh Guadagnoli, Nursing (Pueblo, CO), Kelly Johnson, Nursing (Woodland Park, CO), Kaleb Hansen, Nursing (Lamar, CO), Kaela Becker, Nursing (Fountain, CO), Kaitlin Crowley, Nursing (Pueblo, CO)

Purpose: The purpose of this study was to determine whether taking an NCLEX-RN preparation course while in nursing school increase the likelihood of passing the NCLEX-RN the first time. **Background & Significance:** It behooves both the nursing program and graduated student to have first time NCLEX-RN success: Quintessential NCLEX-RN preparation is therefore a priority of both. Typically, NCLEX-RN preparation programs are instated into nursing programs' curriculum with the intent of increasing first time pass rates. **Methods:** This is a translational research study utilizing a liter-

ature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases used include CINAHL and PubMed. **Findings:** This study found that there is a direct correlation between the addition of an NCLEX-RN preparation course and first-time NCLEX-RN success. **Conclusion:** Based on this translational research study, it is in the best interest of students and nursing programs to incorporate an NCLEX-RN preparation course into curriculum.

Keywords: NCLEX-RN preparation programs, Kaplan, NCLEX pass rates, first-time NCLEX-RN success

1E: Transdermal Aromatherapy: An Emerging Solution to Chronic Pain Management

Jessica Eaton, Nursing (Pueblo, CO), Dora Agyeman, Nursing (Longmont, CO), Huria Tossa, Nursing (Denver, CO), Geoffrey Kipkoech, Nursing (Eldoret, Kenya), Leah Bost, Nursing (Colorado Springs, CO), Bryli Klipfel, Nursing (Rye, CO), Isabel Taylor, Nursing (Monument, CO)

Purpose: To determine the effects of transdermal aromatherapy treatment on relieving chronic or recurrent musculoskeletal or neuropathic pain. **Background & Significance:** Chronic pain commonly increases healthcare visits and limits activities of daily living. It is difficult to control and treat, but newer complementary alternative therapies such as aromatherapy with essential oils have been shown to relieve symptoms such as pain, stiffness, and anxiety. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases searched included CINAHL, Medline, Pubmed, and TRIP. **Findings:** The peer-reviewed articles in this literature review showed statistically significant effectiveness of transdermal aromatherapy for reducing chronic pain severity. **Conclusion:** This translational study demonstrated that transdermal aromatherapy used with standard treatments does improve chronic pain relief compared to standard treatments alone. It has many implications for the prevention of polypharmacy in nursing practice.

Keywords: Nursing Practice, Aromatherapy, Essential Oils, Complimentary Alternative Therapy, Massage, Transdermal, Chronic Pain, Musculoskeletal, Neuropathic

1E: Acute Respiratory Distress Syndrome: Prone vs. Supine Positioning

Tara Eastman, Adult/Gerontology Acute Care Nurse Practitioner (Colorado Springs, CO), Sean Wallis, Adult/Gerontology Acute Care/Family Nurse Practitioner (Lakewood, CO), Joshua Chambers, Adult/Gerontology Acute Care/Family Nurse Practitioner (Parker, CO), Michelle Straight, Adult/Gerontology Acute Care Nurse Practitioner (Colorado Springs, CO)

Purpose: Nearly half of all patients with severe Acute Respiratory Distress Syndrome (ARDS) die from their disease. To determine if prone positioning versus supine positioning is more beneficial for patients experiencing severe ARDS. **Methods:** Translational research, systematic reviews and Meta analyses of the relevant research were

performed by multidisciplinary researchers. Grading of Recommendations were applied. Assessment, Development, and Evaluation methodology for clinical recommendations were demonstrated. All group members have completed the National Institutes of Health Protecting Human Research Participants certificate. **Results:** Based on clinical guidelines, the recommendations for all patients with ARDS is compelling for using lower tidal volumes (4-8 ml/kg) with mechanical ventilation, as well as lower inspiratory pressures (plateau pressure <30 cm H₂O). The recommendation for patients with severe ARDS is compelling for prone positioning for more than twelve hours a day. When patients have moderate or severe ARDS, the recommendation is compelling against the use of high-frequency oscillatory ventilation and provisional for higher positive end-expiratory pressure, and recruitment maneuvers. Further research will need to be done to determine a definitive recommendation concerning the use of extracorporeal membrane oxygenation in patients with severe ARDS. **Conclusion:** Multidisciplinary researchers devised and made available the rationale for their recommendations on certain ventilator interventions for adult patients with ARDS. It is suggested that health care providers that are managing patients with ARDS, personalize their decisions based on each individual patient's needs. Future research will be directed towards the clinical guidelines surrounding severe ARDS and placing patients in the supine versus prone position.

1E: Influenza Vaccine: live attenuated immunization versus inactivated immunization

Tristan Strickland, Nursing (Colorado Springs, CO), *Mike Williams*, Nursing (Pueblo, CO), *Alli Wurscher*, Nursing (Tigard, OR), *Lexi Latika*, Nursing (Pueblo, CO), *Eryn Salinas*, Nursing (Colorado City, CO), *Kaylie Margison*, Nursing (Pueblo, CO), *Ashlee Hanavan*, Nursing (Pueblo, CO)

Purpose: The purpose of this study was to determine whether the inactivated or the live attenuated influenza vaccine caused lower infection rates. **Background & Significance:** There has not been a universally agreed-upon route for the Influenza vaccine that provides less infection rates, as different routes have proven to be effective for different strains of influenza depending on the year. Establishing the route of higher efficacy will lower the incidences of influenza outbreaks. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases used were: CINAHL Plus, Cochrane Library, and Medline. **Findings:** The literature review revealed that there was not a significant difference in infection rates between the inactivated and live attenuated influenza vaccine. **Conclusion:** This translational research study found that the route of the influenza vaccine received, the inactivated or live attenuated influenza, did not cause lower infection rates.

Keywords: *Nursing practice, Efficacy, Influenza vaccine, Live attenuated vaccine, Statistical significance*

1E: The Utilization of Animal Fecal Matter as a Diagnostic for Exposure to AOCs in Freshwater Aquatic Environments

Keenan Wyatt, Chemistry (Pueblo, CO), *Nicholas Androes*, Chemistry (Pueblo, CO)

A pilot, proof of concept research project into the use of fecal matter of American Minks and North American River Otters as a noninvasive diagnostic sample for assessing exposure of ecosystems to anthropogenic organic compounds (AOCs) was recently completed at CSU-Pueblo in collaboration with researchers from the Working Dogs for Conservation Foundation. That successful pilot is being built upon with the current project with the goals of expanding the number of analytes of interest monitored, generating a larger more robust data sets, and measurement of the analytes of interest in waterways using passive sampling. This will be achieved by using pressurized liquid extraction (PLE) to extract target analytes from the fecal matter. The extract will undergo solid phase extraction (SPE) cleanup and pre-concentration by evaporation prior to analysis. Water samples will be collected using polar organic chemical integrative samplers (POCIS), and quantitative analysis using liquid chromatography coupled with a triple quadrupole mass spectrometer (LC/MS/MS) operated in the selected reaction monitoring (SRM) mode to measure 15 analytes (Acetaminophen, Atenolol, Carbamazepine, Diclofenac, Gemfibrozil, Ibuprofen, Lamotrigine, Metformin, Salbutamol, Sertraline, Sulfamethoxazol, Triclosan, Triclocarban, Trimethoprim, and Warfarin). To date an LC/MS/MS method with optimized SRM parameters for analytes ionizing in the positive mode has been completed. Near term goals include an optimization LC/MS/MS method for analytes ionizing in the negative mode and extraction method validation using a surrogate soil-peat moss mixture as a surrogate sample matrix. Once fully validated the extraction and analysis methods will be tested on fecal samples analyzed as part of the pilot study and applied to new samples collected from waterways in Montana.

1E: Phosphohydrolase activities in phosphate-restricted, iron (II)-supplemented Modified Raulin Thom *Penicillium spinulosum* cultures

Sarah Lira, Chemistry (Pueblo West, CO)

Penicillium spinulosum is a fast-growing fungus commonly found on wheat and flour. *Penicillium* fungi have been found to be useful in various applications. Examples of these include food (cheeses), fermentation (silage), animal feed during winter months, antibiotics (penicillin), bioremediation (metal complexation) and reduction of cellulosic landfill wastes and their subsequent conversion to biofuel feedstocks. *Penicillium* cultures can be used for the study of phosphohydrolase activities under varied conditions. A phosphohydrolase is a class of enzyme that is able to hydrolyse phosphate esters. In biological systems, these enzymes recycle phosphorus and may use it to synthesize phosphoesters such as ATP (adenosine triphosphate). In *Penicillium* cultures grown in modified Raulin Thom (mRT) media, we have detected three key phosphohydrolase activities which have been measured based on their ability to hydrolyze the following three artificial substrates: p-nitrophenyl phosphate, bis(p-nitrophenyl)-phosphate, and p-nitrophenyl-phosphorylcholine. Based on their substrate specificity, these enzymes have been designated as acid phosphatase (AP), bisphosphodiesterase (BP), and phosphorylcholine phosphodiesterase (PCPD). In order to increase production of these enzymes, we have grown the fungal cultures in mRT media that is ten-fold limited in phosphate with a concurrent ten-fold increase in iron supplementation. The *P. spinulosum* cultures were grown over the course of a few weeks and culture filtrates were harvested periodically throughout the time period. Culture filtrates were incubated with the three enzyme

substrates to determine the production of the phosphohydrolases at different time points. The results of this study were compared to a parallel study using control mRT media cultures. The main goal of the research is to determine which media conditions will result in increased production and/or activation of the three chosen phosphohydrolases.

1E: Environmental and Human factors on Lark Bunting reproductive success and populations

Connor Dowd, Biology (Pueblo, CO)

The research objectives was to determine how certain human and environmental factors influenced and affected Lark Bunting reproductive success and population numbers. In order to determine the reproductive success birds were trapped and marked. To which we followed the individuals to nests in order to monitor the predation rates and approximately how many offspring were produced. Human factors affect Lark Bunting in negative ways as they are sensitive to climate change and human expansion into their territory. Predation rates and Human factors both negatively affected the Lark Bunting population's sustainability. This research data can provide information for future Lark Bunting conservation.

1E: The impact of glucose uptake and concentration on Sindbis Virus infection

Oluwatobi Oloyede, Biology (Centennial, CO), Erika Krow, Biology (Pueblo, CO), Ying Ying Xue, Biology, Victoria Perez, Biology

Alphaviruses are small, enveloped viruses that are around 70 nm in diameter and contain a single stranded, positive sense RNA genome. Sindbis virus (SINV) is an alphavirus that causes mild symptoms and is widely used for research. Alphaviruses (Sindbis) enter a host cell via receptor mediated endocytosis and the use of clathrin-coated vesicles in order to reproduce within the host's cell. Alphaviruses have been shown to depend on the host's cells glycolysis in order to reproduce, but a complete understanding of how Sindbis virus alters glucose uptake and consumption is unknown. We hypothesize that glucose uptake and glucose concentrations directly impact Sindbis virus replication, and that a better understanding of Sindbis virus' dependence on glucose may lead to novel treatment options or therapeutic interventions to inhibit viral infection and other metabolic disorders. We are looking at how glucose uptake differs in uninfected and Sindbis virus-infected mosquito cells and baby hamster kidney cells. We have detected significant changes to glucose uptake in infected cells, with virally infected cells pulling in more glucose than uninfected cells. We have also seen that viral replication is inhibited if the infected cells have reduced glucose concentrations available for metabolism. The virus replication cycle may be dependent to these manipulations to cellular metabolism and the results represent novel findings on how these viruses successfully infect a cell.

1F: Prevalence of West Nile Virus Antibodies and Blood Mercury Levels in Song Birds Collected from the Colorado Fountain Creek Region

Alyssa Torres, Biology (Brighton, CO), Kayana Casias, Biology (Pueblo, CO)

West Nile Virus (WNV), belongs to the family Flaviviridae, and is carried and spread by mosquitoes and birds. Avian species act as the reservoir for this virus and is the cause of death for thousands of birds. Since its arrival in 1999, WNV has spread throughout North America,

including recent cases in Colorado. Because WNV is kept mostly in a cycle between birds and mosquitoes (*Culex* species), both species are regularly screened for WNV. Mercury (Hg) is commonly found in the environment and is harmful to avian species, affecting their reproduction and health. Based on recent studies, songbirds that contained low amounts of mercury (found in the environment) showed a decline in reproductive success as well as migratory disruption and bird song. Additional data indicates that Hg exposure affects a bird immune response. We are seeking to understand any connections between Hg levels and WNV antibodies in birds sampled in Southern Colorado. Through a collaborative effort, birds have been captured, banded, and blood samples were taken from birds in the Fountain Creek Region of Colorado during the summers of 2014 to 2016. To determine the seroprevalence of WNV antibodies in the bird samples, an indirect enzyme-linked immunosorbent assay (ELISA) was used. Concurrently, the samples were analyzed for mercury content using a DMA 3000 Mercury Analyzer. The data gathered from these bird blood samples from Fountain Creek Region of Colorado is being used to determine if there is a correlation between the WNV antibodies in songbirds and the mercury concentration in their blood. Based on recent studies, Common grackles (an Icteridae family member) are highly susceptible to WNV infection and result in high levels of viremia, this is why the Icteridae family, or the blackbird family, was predicted to display a higher WNV antibody presence than other bird families. After performing ELISAs on the samples of bird blood that was collected in the Fountain Creek Region of Colorado, it was found that 69% of Common Grackles and 39% of Icteridae were positive for WNV antibodies. This information shows that there were, in fact, more WNV antibodies present in Common grackles, than other songbirds that were caught and screened. Birds from the Icteridae family showed significantly higher WNV antibodies than the family Parulidae and Passeridae. We will use this information and data from recent studies on the effect of mercury in songbirds, as well as the data we gathered, to determine if there is a correlation between the WNV antibodies in songbirds, and the mercury concentration in their blood.

1F: Febrile Seizures: Treating Fevers or Not

Seana Maltezo, Adult/Gerontology Acute Care/Family Nurse Practitioner (Dewitt, NE), Erika Valdez, Adult-Gerontology Acute Care and Family Practice Nurse Practitioner (La Junta, CO), Alonzo Lobato, Adult-Gerontology Acute Care and Family Practice Nurse Practitioner (Alamosa, CO)

Febrile seizures are the most common type of convulsions in infants and young children which occur in 2-5% of American children before age 5. Approximately 40 percent of children who experience one febrile seizure will have a recurrence. The purpose of this literature review is to provide evidence to support the advanced practice nurse in clinical decision making to educate parents about when to treat or not treat a fever to improve outcomes for children with febrile seizures. The search engines included CINAHL and PubMed with one clinical practice guideline and three case studies. The information regarded the use of using appropriately dosed antipyretics in comparison to no fever treatment and in correlation of an increase in febrile seizures in children 1-5 years of age. Many times, parents bring their children into doctors' offices or hospitals with fevers and the fear of the patient having a febrile seizure, with or without a history of them. Several studies detected genetic mutations in the $\gamma 2$ subunit of the GABA_A receptor

for children with febrile seizures. In spite of adequate treatment febrile seizures can be recurrent in 30% of cases. Treating a fever or not, did not change if a child will have a febrile seizure or not. Another study showed a connection with low iron levels prior to the seizure in children with a history of febrile seizures. This research has showed the significance of genetics in febrile seizures. There was no connection of treating or not-treating fevers seen in the research. According to the American Academy of Pediatrics (2012), the goal of administering antipyretics should be not only to lower body temperature, but also to provide comfort to the child.

Keywords: fever, febrile seizure, antipyretics, fever guidelines, pediatrics

1F: Tortoises show strong innate immune function instead of immunological memory

Kiara Olson, Biology (Colorado Springs, CO), Brandon Bayer, Biology (Pueblo, CO), Taylor Urban, Biology (Pueblo, CO)

We measured differences in levels of antibody-secreting lymphocytes between tortoises who had previously been immunized with a foreign protein (ovalbumin) and those who had not been immunized. We hypothesized that if tortoises have immunological memory, similar to that exhibited by mammals, immunized tortoises should have higher numbers of lymphocytes. In addition, we predicted higher levels of antibody-secretion by those lymphocytes when they are exposed to ovalbumin in vitro. There was no difference in the number of circulating lymphocytes recognizing ovalbumin, between the two groups of animals. This indicates that tortoises either do not have memory lymphocytes, or that numbers of these cells are very low. After incubation with ovalbumin, lymphocytes of immunized animals also did not produce more antibodies than lymphocytes from unimmunized animals. Again, this suggests that tortoises do not have memory lymphocytes that function in the same way as mammalian memory lymphocytes. However, all animals had lymphocytes that recognized ovalbumin, and we suggest that these are B1 lymphocytes, which may also be protective against disease. We interpreted the presence of high levels of B1 lymphocytes as evidence of strong innate immunity in tortoises.

1F: Tamiflu Timing

Kimberly Crapeau, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO), Nicole Bartolo, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO), Stacie Ramos, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO), Joe Estes, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Background: Influenza is a serious illness. In 2016, the Center for Disease control and Prevention (CDC) reported a mortality rate of 56,000 patients between 2012-2013. The Advanced Practice Nurse needs to provide evidence based treatment for patients with influenza that is timely and cost effective to improve patient outcomes. Tamiflu is frequently prescribed by healthcare providers to prevent or treat influenza and it is important to determine effectiveness. **Objective:** The objective of this study is to determine whether or not prescribing Oseltamivir (Tamiflu), after the CDC recommended 48 hour timeframe, for influenza will be an effective treatment for patients presenting with flu-like symptoms. **Method:** We performed a literature review from the most recent articles cited by the CDC as we wanted reports that were used to support the CDC's clinical recommendations. Reports

were narrowed down based on publish date and reliability. The three publications were of high reliability and were no less than 4 years old containing Neuraminidase inhibitors (NI) randomized control trials, which included Oseltamivir. Two studies were systematic reviews and one was a meta-analysis of randomized control trials. The research sample population in all studies included adults who received or did not receive antiviral treatment for flu-like symptoms within and after 48 hours since their initial flu-like symptoms. **Results:** Oseltamivir has been proven to reduce the duration of symptoms by up to 16.8 hours in adults treated with oseltamivir within 48 hours of influenza symptom onset. Prophylactic use of oseltamivir has been proven efficacious against developing symptomatic influenza. The three studies we chose to use were again the most recent high level of evidence and they demonstrated some benefit to Oseltamivir use > 48 hours for patients with severe, complicated, or progression of their illness requiring hospitalization. Oseltamivir use increased the propensity of nausea, vomiting, psychiatric and renal events in adults. **Implications:** Nurse Practitioners (NP) must utilize careful judgment when prescribing Oseltamivir regarding benefits and harms for treatment of influenza with respect to timing and side effects.

Keywords: Influenza, Neuraminidase, Oseltamivir, Tamiflu

1F: Extracorporeal Membrane Oxygenation (ECMO) Influencing Influenza Outcomes

Jennifer M. Weiss, Adult/Gerontology Acute Care/Family Nurse Practitioner (Atwood, CO), Carissa Shea, Adult/Gerontology Acute Care/Family Nurse Practitioner (Peyton, CO), Kristin Chevalier, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

The Center for Disease Control and Prevention estimates that influenza has led to 12,000 to 56,000 deaths in the United States every year since 2010. As of February 2018, the proportion of deaths attributed to influenza was above the system-specific epidemic threshold as reported by a national mortality surveillance system. The purpose of this study was to determine if adults (18-65 years of age) diagnosed with acute respiratory distress syndrome (ARDS) secondary to influenza would have improved mortality rates if extracorporeal membrane oxygenation (ECMO) was considered. ECMO was compared to low tidal volumes ventilation and prone positioning established by traditional ARDS practice guidelines. The search engines utilized to evaluate evidence to apply to a common patient presentation with ARDS included CINAHL and PubMed with one clinical practice guideline, four cohort studies, and two systematic reviews. This study consisted of multi-faceted approach and meta-analysis of evidence-based research of how EMCO in addition to other ARDS practice guidelines may be essential to assist the Advanced Practice Registered Nurse in making critical decisions that affect mortality. A case study of an otherwise healthy 20-year old male with influenza illustrates a patient commonly treated with life-threatening complications of influenza. The researchers suggested ECMO is a viable therapy for adult patients with respiratory failure and refractory ARDS secondary to influenza to decrease mortality rate outcomes. In the role of the Advanced Practice Nurse, the goal is to restore the patient to an optimal level of wellness using the American Association of Critical-Care Nurses Synergy Model as a framework for patient care. Given the enormity of this problem, it is essential for the nurse practitioner to analyze each situation of adult patients infected with influenza and consider available evidence-based treatment to decrease mortality rates and improve

patient outcomes in this population.

1F: Who Were the Vikings: A Closer Look at Viking Culture

Desiree Lewis, Liberal Studies with minor in Education (Kersey, CO)

Viking culture has always been a rather popular subject explored in the realm of entertainment. There seems to be some sort of fascination pertaining to this group of society. Who were the Vikings? Does Hollywood portray this culture of the past correctly? When our modern-day society thinks of Vikings we see a barbaric group, people who were looking to fight. My research will attempt to prove or disprove who the Vikings truly were. It will take an in depth look at Viking culture, to see if Hollywood's interpretation of this society of the past is fair and accurate.

1F: The Dangerous Queen: Margaret of Anjou and the Wars of the Roses

Isabel Ivery, History (Pueblo, CO)

The purpose of my research project is to determine how Margaret of Anjou's rule contributed to the outbreak of the Wars of the Roses. Because of Henry VI's weak mental state, Margaret of Anjou did much of the ruling of England in his stead. She was a talented strategist, strong-willed and ambitious, while her husband was not. Her heavy influence over Henry VI allowed her to take advantage of his power. Although Richard of York was initially one of Henry VI's most trusted advisers, Margaret's mistrust of Richard deepened the rift between York and Lancaster, and led to the official start of the wars. Therefore, I conclude that the wars themselves were essentially caused by Margaret. My research consists of primary sources including letters written by Margaret herself that create a deeper understanding of her as a person, as well as biographies and scholarly articles that put Margaret's individual role in the Wars of the Roses into the context of the whole ordeal. In relation to examining how Margaret's rule caused the Wars, my research also delves into how Margaret defied societal norms as a strong female political leader in medieval Europe.

1F: Control and Cruelty: The Norman Conquest of England

Jason Curtiss Jr., History (Pueblo, CO)

This research project will explore the reasons behind the success of the Norman Conquest of England. Although the Normans were successful in their conquest of England, there seems to be a wide range of biases on the Conquest. Either scholars look at the fall of Anglo-Saxon England as a tragedy, or they look at the Conquest as the coming of a great age. Many sources also give the Conquest a different timeline, such as ending it at the coronation of William I, ending it at the Harrying of the North, and some end it at the finish of the Domesday Book. For the sake of understanding the success of the Conquest, the end of the Conquest in this research project will be with the completion of the Domesday Book. The true biases, however, during the research will be the primary sources. During the time of the Conquest the primary writers were religious men that used religious ideology in their records of the events, and they belonged to either the Anglo-Saxons or the Normans. Perhaps the most well known fact from the Norman Conquest of England is that the Normans were successful at the Battle of Hastings, but it would be the events afterwards that decided whether or not the Conquest would be a success. From the Norman victory at Hastings in 1066 to the completion of the Domesday Book in 1086, the Norman Conquest was a success because of Norman con-

trol and cruelty over the English people as shown in the assimilation of Norman culture into England, the Harrying of the North, and the Domesday Book.

1F: Constantinople: The Modernization of Warfare in the 15th Century

David Armstrong, History (Colorado Springs, CO)

This research focuses on the military aspect of the fall of Constantinople on May 29, 1453. The intention of this research is to highlight why the Ottomans were successful in the 53-day siege of Constantinople against the Byzantines due to the rise and use of gunpowder and shift in military tactics because of this new commodity of war. Most modern teachings of the siege of Constantinople focus on the implications that the fall had on the empires involved and in surrounding areas. The focus on empires after the fall of Constantinople undermines the rise of new technologies and strategies that would set a precedent for new guidelines in warfare around the globe for generations to come. Based off research conducted by scholars that focus on the ancient world, the fall of Constantinople was due to the walls surrounding the city being intended for pre-gunpowder siege craft and due to the rapid rise of gunpowder technologies such as cannons, the walls were unable to protect the city and remain standing from heavy bombardment.

1F: Sex Ratio Biasing In Lark Buntings (*Calamospiza melanocorys*)

Makenna Fair, Wildlife and Natural Resource Management (Boone, CO)

According to the Fisherian sex ratio theory, sexual selection leads to an equal investment in male and female offspring. Thus, many species have relatively equal numbers of males and females. Lark Buntings, *Calamospiza melanocorys*, a migratory songbird which breeds on the Great Plains of Colorado, have been shown to have an adult male-biased sex ratio. However, the source of the bias is currently unknown. It could arise either in the primary sex ratio through the biasing of offspring sex by female birds, or in the secondary (mature) sex ratios through differential mortality between the sexes. Therefore, the purpose of our study was to determine at what point in the Lark Bunting life cycle is the male sex ratio bias established within the population of Lark Buntings nesting at the Pueblo Chemical Depot in southwestern Colorado. Adults were captured, and the adult sex ratio was determined using plumage characteristics. Hatchlings were captured from the nests and were sexed genetically using markers found on the W and Z chromosomes. Our results showed that there was a male biased secondary sex ratio and a female biased primary sex ratio.

1F: The Bikini Bottom: The Lifeways of Marshallese Islanders Since WWII

Spencer Little, History (Wetmore, CO)

The Bikini Atoll was forcibly cleared by the United States in order to make way for atomic bomb tests in the Pacific. Formerly the US Trust Islands and today a part of the Republic of the Marshall Islands, a mass forced migration of a complex indigenous society destroyed much of what is known of these inhabitants. The testing of Castle Bravo and other bombs, near Bikini Atoll destroyed the island, and they have not been reinhabited for the past 70 years. The Marshall Islands were granted independence in 1986, though their politics are still very much tied to our own system. This poster seeks to explore the

traditional lifeways of the Marshallese people before the World Wars, the diaspora of these populations to other islands and nations, and the modern adaptations that the traditional Marshallese people have made as a response to the tumultuous past century. While much scholarship has focused on the Bikini Atoll as a nuclear testing grounds, few sources speak on the traditional inhabitants of these islands. Data from historical documents and firsthand accounts will be used alongside ethnographic and archaeological studies of the island in order to understand the humanity of a disenfranchised peoples. Traditional religious beliefs of the islands will also be explored as there is evidence that the United States and its horrors against this nation have been recorded as part of a larger known cosmological scheme involving trickster deities and other mythological conventions. Finally this paper will explore in what ways the Marshall Islands have been incorporated into our mythologies, with depictions of “deserted isles” and appearances in popular media (i.e. Spongebob Squarepants) reinforcing the notion of the Marshall Islands as an uninhabited paradise.

2A: Treatment of Gonorrhea

Adrianna Allen, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

The aim is to determine if obtaining a definitive positive result via molecular testing prior to treatment of a possible sexually transmitted gonorrhea infection in an asymptomatic adult female will help combat *N. gonorrhoeae* antimicrobial resistance. Gonorrhea is a common, sexually transmitted infection that if left untreated can pose multiple health risks to women, including pelvic inflammatory disease, infertility, and ectopic pregnancies. Often, gonococcal infections in women are asymptomatic and may go unnoticed until complications arise. Treatment guidelines for gonorrhea are also changing related to increased antimicrobial resistance. Currently, dual therapy of ceftriaxone injection plus oral azithromycin is the only appropriate treatment for gonorrhea infection, and there are already reports of gonococcal strains resistant to ceftriaxone. If this trend in antibiotic resistance continues, gonorrhea may soon be an infection untreatable with antibiotics. It is recommended in current treatment guidelines for a definitive diagnosis of *N. gonorrhoeae* to be made prior to treatment with antibiotics, however with no point of care testing available, empiric treatment with antibiotics are often given in acute care settings such as emergency rooms and urgent cares. The advanced practice nurse will utilize Dorothea Orem's Theory of Self Care to empower the patient in prevention techniques against gonorrhea infection. NIH training was completed with active certification prior to the gathering of this information. Information for this translational research using a literature review design was obtained using CINAHL and Google Scholar for keywords including gonorrhea treatment and antibiotic resistance.

2A: Rapid Antigen Detection Test Vs. CENTOR Criteria to Diagnose Strep Throat

Yaghma Norouzi, Adult/Gerontology Acute Care Nurse Practitioner (Pueblo, CO)

Group A streptococcal (GAS) pharyngitis is the most common bacterial cause of pharyngitis in the world affecting about half a billion people every year and is the only upper respiratory infection that requires accurate diagnosis and prompt treatment. Inappropriate or no treatment of this disease is the cause of the vast majority of acute rheumatic fever (ARF), rheumatic heart disease (RHD), acute

post-streptococcal glomerulonephritis (APSGN), and invasive *S. pyogenes* causing necrotizing fasciitis. There are different methods to diagnose GAS pharyngitis including throat culture, rapid antigen detection test (RADT), and Centor or McIsaac criteria. According to guidelines provided by infectious disease society of America to diagnose and treat GAS pharyngitis, the gold standard for diagnosis of this disease is throat culture however, in adults, RADT is the preferred method due to its ability to provide instant results that are comparable to throat culture. Translational research using a literature review design shows in adults 15 years or older RADT, with sensitivity (0.86, 95% CI) and specificity (0.96, 95% CI), is the more reliable method of diagnosing GAS pharyngitis than Centor criteria, using Centor (score ≥ 3) with specificity (0.82, 95% CI), given the availability, age, and level of research. The author has completed NIH training and holds a current NIH certificate.

2A: Treatment of Vitamin D Deficiency in Adults

Irene Rawls, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Recent studies suggest vitamin D deficiency is associated with many chronic conditions ranging from cardiac to cancer. A deficiency is defined as a serum 25-hydroxyvitamin D level of less than 20 ng per mL, which can be determined by obtaining a 25-hydroxyvitamin D level in patients with suspected vitamin D deficiency. Common manifestations of vitamin D deficiency include symmetric low back pain, proximal muscle weakness, muscle aches, and throbbing bone pain elicited with pressure over the sternum or tibia. When a deficiency is present, the goal of treatment is to normalize levels to relieve symptoms and decrease the risk of other adverse health outcomes. Contradictory evidence has prevented standardization of treatment. Currently, the U.S. Preventive Services Task Force recommended treatment ergocalciferol (vitamin D2) or cholecalciferol (vitamin D3) for treatment of vitamin deficiency. An extensive transitional research using a literature review design of the treatment option for vitamin D deficiency in adult (>18) was conducted in PUBMED, the Cochrane Library, MEDLINE, and CINAHL (all up to January 2018) by an independent researcher trained by the National Institutes of Health (NIH) with active certification Number: 2323354. Evidence shows that vitamin D3 supplementation may reduce fracture, fall rates in adults, and other chronic disease in persons with vitamin D deficiency.

Keywords: vitamin d and vitamin D deficiency

2B: Blunt Abdominal Trauma: Positive Seat Belt Sign

Crystal Michelle White, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

This study examined patients with acute blunt abdominal trauma presenting with a positive seatbelt sign does the use of imaging alone reduce the risk for morbidity and mortality related to intraabdominal injury compared with hospital admission to include serial physical examinations 24 hours post traumatic injury. Research Design was a translational research using a literature review design. Abstract method was a literature review and completion of the NIH. Conclusions include admission and serial physical exams after negative diagnostic imaging are recommended for patients that present with a positive seatbelt sign. A positive seatbelt sign predicts likelihood for intraabdominal injury in one third of blunt abdominal traumatic patients.

Multidetector helical computed tomography (MDCT) has become the primary method for identifying intraabdominal injury. Sensitivity and Specificity of MDCT is 98% and 99% respectively. Providers managing blunt abdominal trauma must maintain a high degree of clinical suspicion for intraabdominal injury particularly with suggestive mechanisms or signs of external signs of trauma such as a positive seatbelt sign, rebound tenderness, hypotension, abdominal distension, abdominal guarding and severe distracting injury. Patient's with seemingly less severe trauma on initial examination may have significant injury and delayed diagnosis is an important cause of preventable morbidity and mortality. The presence of a seat belt sign (likelihood ratio (LR) range 5.6-9.9), Rebound tenderness (LR 6.5), Hypotension (LR 5.2), abdominal distention (LR 3.8) or guarding (LR 3.7) suggest an intra-abdominal injury.

2B: Permissive Hypotension in Trauma Patients

Christine Christiansen, Adult/Gerontology Acute Care/Family Nurse Practitioner (Peyton, CO)

Trauma is the #1 leading cause of death among 1– 46 years old population and has an annual health care cost of \$671 billion. Globally there are over 5.8 million lives lost from trauma complications and is anticipated to increase to over 8 million deaths in the year 2020. Post traumatic uncontrolled hemorrhage is often the leading cause of mortality in 80% of trauma patients. Although trauma interventions have evolved in the last few decades, aggressive intravenous fluid resuscitation remains to be the traditional treatment in hemorrhagic trauma patients. Consequently, this led to a literature review to determine if permissive hypotension is a better resuscitation strategy than aggressive intravenous fluid approach due to the belief that it results to less complications and better patient outcome. The AACN Synergy Model for patient care was utilized to ensure indicated APRN interventions were appropriate for this patient population. A translational research process using a literature review in PubMed, CINAHL, Cochrane and Uptodate.com were used with key terms to include hemorrhagic shock, trauma, permissive hypotension and resuscitation techniques. Completion of the NIH training with active certifications were also completed. Research resulted from a systematic review, RCT studies and a practice guideline that included Wang's et al. research demonstrating liberal intravenous resuscitation methods having a higher mortality rate due to coagulopathy, acidosis, hypothermia and hypoxia complications. In addition, a published European guideline was found recommending permissive hypotension approach on hemorrhagic trauma patients as it demonstrated less complications. Due to the research findings, permissive hypotension should be the preferred method when treating hemorrhagic trauma patients as the overall outcome is another saved life.

2B: Tranexamic Acid: Use in Hemorrhagic Shock

Jennifer Merten, Adult/Gerontology Acute Care/Family Nurse Practitioner (Winter Park, CO)

Uncontrolled hemorrhage is a significant source of death in trauma victims. Antifibrinolytic treatment with tranexamic acid (TXA) exhibits efficacy in reducing blood loss after trauma, especially in the rural emergency department setting, where blood product availability is scarce, and transport to a higher level of care is delayed for hemorrhagic shock patients. As an advanced practice nurse (APN) and having

completed the National Institutes of Health Office of Extramural Research web-based training with active certification, this presentation focuses on translational research using a literature review design. The Clinical Randomization of an Antifibrinolytic in Significant Hemorrhage trial, also known as CRASH-2, and Military Application of Tranexamic Acid in Trauma Emergency Resuscitation (MATTERS) study, demonstrate the use of TXA in reducing hemorrhagic death due to bleeding, if administered by the APN within three-hours post-injury. In correlation with the CRASH-2 and MATTERS results, medical directors from Denver Health East Grand Emergency Center formulated a clinical practice guideline and protocol for indication and administration of TXA. Together, the clinical practice guideline for TXA and adaptation of the American Association of Critical-Care Nurses (AACN) Synergy Model for Patient Care to Critical Care Transport allow for delivery of the most optimal expeditious care for the hemorrhagic shock patient in a rural emergency department setting. Timely administration of TXA within three hours of injury is associated with reduced patient mortality.

2C: Cannabinoid Hyperemesis Syndrome: Haloperidol Treatment Compared To Ondansetron

Joseph Miller, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

Aim: To determine the most effective treatment for the hyper emetic phase of Cannabis Hyperemesis Syndrome (CHS) by comparing the use of ondansetron to haloperidol. **Background:** From 2001-2013 cannabis use doubled in the United States from 4.1-9.5%. In a study featuring two Colorado Emergency Rooms, visits for Cannabis Hyperemesis Syndrome (CHS) doubled from 41 visits during pre-legalization to 81 visits post legalization. **Conceptual Framework:** Orem's Self Care Theory is utilized to treat the patient in the hyper emetic phase as well as long term by reducing the patient's nausea and vomiting and allowing the patient to sustain cannabis cessation. **Methods:** This is translational research using a literature review design. The student completed NIH training with active certifications. Using the search terms Cannabis Hyperemesis Syndrome, Cannabis Hyperemesis Syndrome treatment, Cannabis Hyperemesis Syndrome practice guideline, CINAHL, AHRQ, and the Cochrane databases were searched for information related to treatment for CHS. Five articles were reviewed; systematic reviews (2), and case studies (3). **Results:** Data from a 2017 systematic review demonstrates clinical success rates of 5.71% for ondansetron compared to 77.7% for haloperidol for treatment of the hyper emetic phase of CHS. Case studies continue to be published illustrating haloperidol's success in terminating nausea and vomiting associated with the hyper emetic phase of CHS. **Implications:** Based upon the evidence collected, the Advanced Practice Nurses would advocate for using haloperidol for treatment of the hyper emetic phase of CHS for patient safety, comfort, cost, reduced Emergency Room stay, as well as improving overall patient outcomes.

2C: A Pueblo Crisis

Anna Horton-Symons, Business Administration (Pueblo, CO)

Over the past few years the war on Heroin has waged in Pueblo. Fueled by the vast distribution of opioid drugs, and combated by very few organizations and concerned citizens, this war has deteriorated the reputation of Pueblo. In this paper I will be explaining the link between opioid drug prescribing, and the heroin war, the effects that it

has had on this little community as it pertains to the rest of Colorado, and describe some of the efforts that Rise Above Colorado have taken to help end this war among the teen population.

2C: Reducing Neonatal Abstinence Syndrome

Tina Tripp, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Background: Neonatal Abstinence Syndrome (NAS) is a drug withdrawal syndrome commonly observed in intrauterine exposure to opioids and has shown a significant increase in pregnant mothers over the past decade. In pregnant women, with an opiate addiction, it is the recommendation of the American Congress of Obstetricians and Gynecologists to extend maintenance therapy including buprenorphine or methadone. **Aim:** To determine the safety of buprenorphine compared with methadone in the attempted treatment of pregnant mothers who are abusing opioids in respect to NAS. **Method:** Translational research using a literature review design was conducted and National Institutes of Health certificate was completed with active certification. **Conclusion:** Complete opioid abstinence during pregnancy is ideal. Acute withdrawal from opioids during pregnancy may lead to heavier use by mother, or worse, spontaneous abortion. In meta-analyses comparing methadone to buprenorphine, buprenorphine was associated with a lower risk of preterm birth, a greater birth weight, and a larger head circumference. Buprenorphine was found to produce lower risks of preterm birth.

Keywords: *opioid abuse, pregnancy, withdrawal, neonatal abstinence syndrome*

2D: A Review of the Effectiveness of Needle Exchange Programs in Decreasing the Incidence of HIV Transmission Within Studied Populations

Matthew Leberknight, Nursing (San Jose, CA), *Caitlin Weaver*, Nursing (Davenport, CA), *Sahaja Lobith*, Nursing (Mountain View, CA), *Kelly McLean*, Nursing (Pueblo, CO), *Rebecca Ketchum*, Nursing (Watertown, NY), *Janine Dillaba*, Nursing (Pueblo, CO), *Daniel Townzen*, Nursing (Rogers, AR)

Purpose: To determine whether needle exchange programs reduce the incidence of HIV transmission in vulnerable populations. **Background & Significance:** The opioid epidemic has resulted in a spike in HIV transmission caused by the sharing of needles among persons who inject drugs (PWID). One popular harm-reduction strategy is the implementation of needle exchange programs, where PWID are given a free clean needle in exchange for a used needle. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. Databases PubMed, JSTOR, and CINAHL were searched with keywords Nursing Practice, Needle Exchange Program, and HIV Transmission. **Findings:** Despite the varying methodologies of recent research, each study examined concluded these programs demonstrate a statistically significant ($p \leq 0.05$) reduction in HIV transmission among the studied populations. **Conclusion:** The evidence shows that needle exchange programs reduce the incidence of HIV transmission in vulnerable populations, and that leaders in nursing practice should contribute to and encourage the development of these programs.

Keywords: *Nursing Practice, Needle Exchange Program, HIV Transmission, HIV Harm Reduction*

2D: Under Pressure: The Use of Pressure Relieving Mattresses

Leslie Roberts, Nursing (Canon City, CO), *Aubrienne Lewellen*, Nursing (Franktown, CO), *Shannon Pedzinski*, Nursing (Canon City, CO), *Rose McMurry*, Nursing (Lakewood, CO), *Lisa Muff*, Nursing (Westminster, CO), *Savannah Nicks*, Nursing (Pueblo, CO), *Curtis Bennett*, Nursing (Pueblo, CO)

Purpose: This study's aim was to determine the effectiveness of pressure relieving mattresses (PRMs) in preventing pressure injuries (PIs) among partially or completely immobilized patients in order to implement this standard in community settings. **Background/Significance:** There is perhaps no greater preventable cause of suffering and morbidity than PIs, costing the United States health care system \$11b annually. **Method:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. The databases used were CINAHL, PubMed, Science Direct, and Cochrane Library. **Findings:** The literature review revealed that the use of PRMs significantly decreased the incidence of PIs, while pressure-relieving overlays and standard mattresses did not. The mattresses have been rated by patients at home and in the hospital as more comfortable and usable than traditional mattresses. **Conclusion:** This study confirmed the use of these mattresses as a current standard of care and reinforced their need in a home health setting among the community.

Keywords: *Pressure Relieving Mattress, Pressure Ulcers, Pressure Injury, Pressure Ulcer Prevention, Alternating Pressure Air Mattress*

2D: Pedestrian Walking Speed in Pueblo

Shelby Nesselhauf, Civil Engineering Technology and Construction Management (Pueblo, CO), *Nicholas Wibbenmeyer*, Civil Engineering Technology (Pueblo, CO)

Pedestrian cross-walks in urban streets are an inevitable part of highway design. The pedestrian walking speed is required to design the period of cross-walk signal time. However, limited studies are available in the literature about the value of pedestrian walking speed. Whatever studies are available are based on very congested downtowns, which may not represent the condition of Pueblo, Colorado. This study is thus motivated in measuring the pedestrian walking speed in different regions of Pueblo. University area, shopping mall area, school zones, signalized intersections, etc. have been studied. In addition, the difference in walking speed among males, females, and children were discretized. Results show that the walking speed varies from area to area. Men, women, and children have different walking speeds. More of the results will be presented in the poster.

2D: Robotic or redundant: a comparison study review of the da Vinci Surgical System and standard laparoscopic procedures

Kelly Bekeris, Nursing (Colorado Springs, CO), *Sharice Jones*, Nursing (Colorado Springs, CO), *Noemi Miller*, Nursing (Colorado Springs, CO), *Taylor Engle*, Nursing (Colorado Springs, CO), *Josh True*, Nursing (Colorado Springs, CO), *Lauren Leopold*, Nursing (Colorado Springs, CO), *Jesslyn Liwanag*, Nursing (Colorado Springs, CO)

Purpose: The focus of this study is to compare the post-operative outcomes between common laparoscopic surgeries that are also performed via the Da Vinci robotic system to determine if one approach is more beneficial than the other. **Background & Significance:** Many complications can arise during extensive surgical procedures that may be detrimental to a patient's health. The Da Vinci robotic surgery system looks to eliminate some of the adverse effects by the means of minimally invasive surgery with a magnified view and an increase of the surgeon's range of motion. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. CINAHL, PubMed, Cochrane Library. **Findings:** The literature review revealed that surgeries utilizing the Da Vinci robotic system resulted in longer operative time, increased cost, decreased blood loss, shortened hospital stay, and smaller incisions. **Conclusion:** This translational research study found that there are benefits associated with the Da Vinci surgical robotic system that can improve post-operative complications.

Keywords: *Da Vinci robot, laparoscopic, post-operative complications*

2D: COPD and Telehealth

Jennifer Slane, Nursing (Colorado Springs, CO), Ryan Parnes, Nursing (Ketchum, ID), Anabi Najar Madera, Nursing (Aurora, CO), Samson Mutua, Nursing (Salt Lake City, UT), Roberto Chacon, Nursing (Pueblo, CO), Angelina Mungia, Nursing (Pueblo, CO), Michael Sage, Nursing (Pueblo, CO)

Purpose: This study aimed to find out whether the inclusion of telenursing decreases hospital admission and readmission for Chronic Obstructive Pulmonary Disease (COPD) patients. **Background & Significance:** COPD has been a common problem in the aging population, the time and costs of care have increased over the years. The Readmissions Reduction Program (HRRP) also dictates that Medicare and Medicaid will pay less for readmissions within 30 days for this condition. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. The following databases were utilized for this review: Academic Search Premier, PubMed, Nursing and Allied Health Collection. **Findings:** The research concludes that this service decreases admission rates significantly within a year. The research also includes that telehealth is cheaper than a hospital visit. **Conclusion:** The inclusion of telehealth care does improve health outcomes for patients suffering from COPD compared to those patients who receive only traditional treatment and monitoring.

Keywords: *COPD exacerbations, telehealth, telenursing, hospital readmissions*

2D: Put A Cap On It!

Renee E. Gribble, Nursing (Colorado Springs, CO), Heather J. Knox, Nursing (Merced, CA), Hui Jeong Kim, Nursing (Colorado Springs, CO), Karla M. Dunston, Nursing (Alamosa, CO), Kayla D. Smith, Nursing (Lake Jackson, TX), Danielle M. Miller, Nursing

(Littleton, CO), Samantha A. Geisick, Nursing (Eaton, CO)

Purpose: The purpose of this study was to determine if the use of alcohol imbedded caps on intravenous (IV) connection sites will cause a significant reduction in the rates of blood-stream infections. **Background & Significance:** Intravenous catheters are essential to health-care practices, however, these catheters put patients at a risk for blood stream infections. According to the CDC approximately 80,000 blood-stream infections happen per year across the United States resulting in an annual cost of \$296 million dollars. **Methods:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. This study utilized CINAHL, Medline, and Elsevier research databases. **Findings:** This literature review revealed statistically significant evidence that the use of alcohol imbedded caps on the IV connection site reduces the incidence of blood-stream infections, and therefore saves hospitals hundreds of thousands of dollars in the process. **Conclusion:** This translational research study proved that the use of alcohol imbedded caps significantly reduces the incidence of blood-stream infections and should be used on all patients with intravenous access.

Keywords: *Alcohol imbedded caps, infection, intravenous access, passive disinfection*

2D: Biking Speed in Pueblo

Krystal Vallejos, Civil Engineering Technology (Pueblo, CO), Griselda Araujo, Civil Engineering Technology (Pueblo, CO)

Biking in urban streets is an inevitable part of highway design. The biking speed is required to design the geometry of bike Xing. However, limited studies are available in the literature about the value of biking speed. Whatever studies are available are based on selected areas which may not represent the condition of Pueblo, Colorado. This study is thus motivated in measuring the bike speed in different regions of Pueblo. University area, shopping mall area, school zones, signalized intersections, etc. have been studied. In addition, the difference in walking speed among male, female, kids, etc. were discretized. Results show that the biking speed varies from area to area. Male and female have different biking speed. More of the results will be presented in the poster.

2D: Shorter Shifts or Longer Weekends

Darian Horvat, Nursing (Pueblo, CO), Ashley Richardson, Nursing (Pueblo, CO), Mercedes Trujillo, Nursing (Pueblo, CO), Bryanna Houser, Nursing (Pueblo, CO), McKenzie Pacheco, Nursing (Pueblo, CO), Brittany Guerra, Nursing (Pueblo, CO), Jalissa Peterson, Nursing (Pueblo, CO)

Purpose: The purpose of this study was to evaluate nursing quality of care in an 8-hour shift vs. a 12-hour shift. **Background/significance:** In today's nursing society, 12-hour shifts have taken over and 8-hour shifts have become less common. With the longer shift lengths, patient care and safety outcomes have required evaluation due to poor communication, pain that went uncontrolled, and not receiving help at the time they wanted it. **Design/method:** This is a translational research study utilizing a literature review design. All authors have completed the National Institute of Health (NIH) Office of Extramural Research's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. This study utilized CINAHL, Medline, and Elsevier research databases. **Findings:** This literature review revealed statistically significant evidence that the use of alcohol imbedded caps on the IV connection site reduces the incidence of blood-stream infections, and therefore saves hospitals hundreds of thousands of dollars in the process. **Conclusion:** This translational research study proved that the use of alcohol imbedded caps significantly reduces the incidence of blood-stream infections and should be used on all patients with intravenous access.

search's online training, "Protecting Human Research Participants", this semester and hold current certification. This study does not include human subjects and is exempt from IRB approval. **Findings:** Throughout this course of research, more nurses were working 12 hour shifts and few hospitals were working 8-hour shifts. Nurses were more satisfied and more willing to work 12-hour shifts compared to 8-hour shifts. **Conclusion:** This translational research study showed that nurses who worked 12-hour shifts were more susceptible to an increase in burnout and overtime, resulting in poor patient outcomes. We recommend facilities to review current shift lengths in order to limit hours worked.

Keywords: 12-hour shifts, 8-hour shifts, safety, patient outcomes, quality of care

2D: Defect Detection and Location in Wind Turbine Tower Using Vibration Analysis

Franchesca Montoya, Industrial Engineering (Pueblo, CO), *James Steele*, Mechatronics Engineering (Pueblo, CO)

Project: Defect Detection and Location in Wind Turbine Tower Using Vibration Analysis

Description: Investigate the feasibility of detecting and locating defects and delaminations in wind turbine towers where visual inspections would be difficult or impossible. This method is based on a vibration technique for non-destructive assessment of the integrity of structures by using measurements of changes in the natural frequency.

Measurements can be made at a single point in the structure. Natural frequencies of the undamaged structure are measured then routinely re-measured at intervals to detect the defect site. The experiment will be conducted on a prototype of structures in the laboratory.

Partners: James Steele, Franchesca Montoya

Dr. Ansaf, Dr. Depalma, Dr. Duong

Analysis:

Structure: A wind tower is going to be analyzed, however there is an additional frequency in the turbine due to the rotation of the spinning blades that will be accounted for in the analysis.

Vibration: The vibrational analysis will indicate how the structure will react physically respond to different vibrational frequencies; Solidworks has an analysis feature which allows you to examine these effects.

The frequency at which an object tends to vibrate with when disturbed is known as the natural frequency of the object. Every design has its preferred frequencies of vibration, called resonant frequencies, such frequencies are characterized by specific modes of vibration.

- Normal Mode of an oscillating system is a pattern of motion in which all parts of the system move sinusoidally with the same frequency and with a fixed phase relation
- Free motion described by the normal modes takes place at the fixed frequencies
- SolidWorks:
- Finite Element Analysis:
- Understand the physical behaviors of a complex object with the effects of vibration on a
- Predict the performance and behavior of the design; to calculate the safety margin; and identify the weakness of the design accurately
- Identify the optimal design
- First nodal quantity [displacement]

- Secondary quantities [stresses and strains]

Websites: https://www.engr.uvic.ca/~mech410/lectures/FEA_Theory.pdf

2D: Defect Detection and Location in Wind Turbine Tower Using Vibration Technique

Franchesca Montoya, Industrial Engineering (Pueblo, CO), *James Steele*, Mechatronics Engineering (Pueblo, CO)

The aim of this work is to investigate the feasibility of detecting and locating defect in wind turbine tower where visual inspection would be difficult or impossible. This method is based on a vibration technique for non-destructively assessing the integrity of structures by using measurements of changes in the natural frequencies. Such measurement can be made at a single point in the structure. The natural frequencies of the undamaged structure are measured, and then routinely re-measured at intervals to predict the most likely defect site. The experimental study will be conducted on a prototype structures in the laboratory.

2D: Rocky Mountain Goats (*Oreamnos americanus*) habitat ranges and changing environments effects on Quandary Peak

Rocky Spencer, Wildlife and Natural Resource Management (Gaylord, MI)

Rocky Mountain Goats (*Oreamnos americanus*) became locally extinct in Colorado in 1859, then were reintroduced around 1947. Once restored, Rocky Mountain Goats expanded their ranges throughout Colorado, including Quandary Peak near Breckenridge. Observations of Quandary Peak herd's numbers, behavior, elevation ranges, and the associated plant communities were recorded from July 2017 through the end of September 2017. The summer range on Quandary Peak was found to be 3,559 - 4,161 meters; the elevation range is similar to that of the Mount Evan herds. The Quandary Peak herd size ranged from 33-48 individuals. Behavioral interactions with humans indicated they were not fearful of humans. The plant community in the Quandary Peak area has become denser with low lying vegetation over the past 15 years when compared to older photos. Their populations are increasing locally based on comparisons to Colorado Department of Parks and Wildlife census records, and hunting permits from Colorado Park and Wildlife suggest their populations are sustainable. Their interaction with people can be a problem since they are lacking the fear and are associating humans with food. With the habitat changing it is providing the mountain goats with more food and shelter at lower elevations.

2D: Project Azorian: The CIA's Secret Operation to Recover a Lost Soviet Nuclear Submarine

Albert L. Marshall, History (Beulah, CO)

In 1968, the Soviet Union suffered the loss of the K-129, a nuclear missile submarine, deep in the waters of the Pacific Ocean. The Soviets were unable to locate their lost submarine, and this left open an opportunity for an intelligence coup. The United States attempted the deepest underwater salvage operation ever by utilizing state of the art technology developed in complete secrecy. The operation was dogged from the start with technical, financial, and political problems. From the CIA's redacted accounts, only a thirty-eight-foot portion of the submarine was recovered, but this section did not include the nuclear missiles or other sensitive areas that were most sought after. Project

Azorian developed techniques used to at least partially accomplish the deepest underwater salvage operation ever attempted, but its success was limited and attempts to maintain its secrecy were not entirely successful.

The CIA used Howard Hughes and his company Global Marine Development Inc. as both the builder of the salvage vessel and cover story for the operation. Under the auspices that the ship, the Hughes Glomar Explorer, was built to extract manganese nodules from the ocean floor, the CIA developed technology to extract the K-129 from a depth below 16,000 feet. By the time the ship arrived above the wreck, the Soviets were aware that a salvage operation could be underway. The press too had already caught wind of the operation, but the story did not run until 1975. The engineering and technical difficulties involved with the salvage of a wreck at such extreme depths presented their own challenges while the threat of Soviet ships shadowing the operation was ever present. In the end, Project Azorian retrieved some of the K-129, but how much intelligence retrieved and its use to the United States still remains a mystery.

2E: Quality of Life in ALS Patients: Psychological Interventions

Jessie Niedens, Adult/Gerontology Acute Care/Family Nurse Practitioner (Canon City, CO), *Brianna Jackson*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Castle Rock, CO), *Charles Cobb*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Canon City, CO), *Jacob Scott*, Psychiatric-Mental Health Nurse Practitioner (Pueblo, CO)

Johns Hopkins estimates that 5,000 new cases of Amyotrophic Lateral Sclerosis (ALS) are diagnosed in the United States each year. The profound emotional impact of this deadly disease is often overlooked by the need to mitigate the physical devastation it causes. The aim of our research is to review the current evidence-based information available to providers to determine: in patients diagnosed with Amyotrophic Lateral Sclerosis (ALS, aka Lou Gehrig's Disease or Motor Neuron Disease) (P), how do psychological interventions (I) compared to not receiving psychological interventions (C) improve quality of life (O) until death (T)? A literature review of one RCT, two qualitative studies, one meta-analysis of 22 studies, and one review of suggested clinical practice guidelines in Italy were studied to determine the impact of psychological interventions on ALS patients. Databases searched included CINAHL, Pubmed, Science Direct, and Medline. The research suggests that psychological interventions are important in ALS care; however, additional research and the development of an evidence-based clinical practice guideline are needed to demonstrate if psychological interventions can improve quality of life in ALS patients. The research reviewed evaluated various approaches to psychological management at diagnosis and throughout the course of the disease until death. The authors suggest that various psychological interventions can improve quality of life for ALS patients by improving coping skills and decreasing depression. Our research also found that there is an increasing need for providers to be made aware of the relationship between psychological factors and quality of life. Therefore, it is imperative that more research is done to assist the provider in not only recognizing and treating the physical symptoms of ALS, but the psychological symptoms as well.

2E: Effects of Childhood Trauma on Adult Mental Health

Matthew Augerot, Psychiatric-Mental Health Nurse Practitioner (Pueblo, CO), *Eric Moore*, Psychiatric-Mental Health Nurse Practitioner (Colorado Springs, CO), *Rebecca Hearst*, Psychiatric-Mental Health Nurse Practitioner (Pueblo, CO), *Julie Clark*, Psychiatric-Mental Health Nurse Practitioner (Pueblo, CO)

Although childhood trauma is only screened by less than one-third of primary care providers, findings have shown that the abuse can have long-lasting effects on an individual's physical and mental health. Childhood trauma can include neglect, physical abuse, sexual abuse, emotional abuse, bullying, domestic violence, or even daily interaction with someone suffering from a mental illness or substance abuse problem. An integrated review was conducted to investigate childhood trauma, which noted that adolescents who have experienced trauma were at a higher risk of developing a mental health disorder before the age of 30 years. There is ample evidence indicating that exposure to childhood trauma can strongly predict substance dependence and/or abuse, as well as psychotic disorders. Studies have shown that a reduction in childhood traumatic episodes and early therapeutic intervention can decrease the incidence of psychotic experiences in adulthood. Based on current research, the Adverse Childhood Experiences (ACEs) screening tool should be utilized for patients under the age of 18 years, directing further treatment requirements needed to decrease the prevalence of mental health disorders. Mental illness can be unpredictable; however, it is imperative to take steps toward prevention through adequate screening for childhood trauma and early therapeutic intervention.

Keywords: trauma, mental illness, child, adult

2E: Design of Steel Structure Inspection Robot

Seth Marquez, Mechatronics (Pueblo, CO), *Zachary Miketa*, Mechatronics (Pueblo, CO)

Welding inspection for some critical components, such as sections of a wind turbine tower, is a key to ensure the quality and safety of the whole steel structure. This work emphasizes the design and control of a compact mobile robot that utilizes magnets to adhere to the steel structures' surface. Using a self-propelled robot that could carry non-destructive evaluation (NDE) sensors to inspect metal structures would greatly reduce human error as well as reduce the risk and/or accident. This robot autonomously navigates on a steel frame by fusing data from a high precision inertial measuring unit (IMU), hall-effect sensors, ultrasonic distance sensors, and a 3D depth camera. It can travel on vertical wall or along inner/outer circumference of a wind turbine tower framework.

2E: Ionic Polymer Metal Composites (IPMC) Characterization

Marc-Anthony Smith, Mechatronics (Pueblo, CO), *Hassan Abdulkareem*, Mechatronics, *Brandon DeHerrera*, Mechatronics

In this research, IPMC will be tested to determine their electromechanical characteristics at different working conditions (temperature and humidity), with the end goal being is improving the modeling and control aspects of the IPMC material for using in the actuating and sensing applications. A new high power pulse generating device is developed to meet the unique requirements of the supply voltage (type, amplitude, and frequency) and current to the IPMC strips as well as to improve the accuracy of the displacement measurements.

2E: Electrospinning Process Applications

D. Mike Daniel, Mechatronics (Pueblo, CO), Shamas Uhazanfar, Mechatronics

Electrospinning is a technique which has been used in order to successfully create polymer nanofibers. In this process, a charged polymer jet is collected on a grounded collection plate. A polymer jet is formed when an applied high-voltage electrostatic charge is used to overcome the surface tension of the solution. In this work, we explore the effectiveness of different experimental setups, such as vertical/horizontal static collectors and drum or rotating collector as well as various materials are researched.

Also, some of the key parameters to affect the final nanofibers' quality, such as the polymer molecular weight, solution viscosity, electric potential, flow rate and concentration, distance between the capillary and collector, etc., need to be studied.

2E: Study of Digital Light Projection (DLP) 3D Printing Technologies

Kalvin Hessling, Mechatronics (Pueblo, CO), Kyle Rosenbrock, Mechatronics, Marcus Martinez, Mechatronics

In this work, three novel DLP 3D printers are compared according to their ease of use, speed, and precision. Tensile test specimens are 3D printed and tested using an Instron testing machine. Then, the DLP 3D printing processes are compared to the fused filament fabrication 3D printing processes, for ease of use, printing speed, object precision, surface finish, and strength.

2E: The Cadaver Synod: Interdependence of the Church and Politics in 9th Century Italy

Spencer Little, History (Wetmore, CO)

Jean-Paul Laurens' 1870 painting, *Le Pape Formose et Étienne VII*, depicts the infamous "Cadaver Synod" of 897. The former Pope Formosus was exhumed from his grave and put on trial, granted a throne to sit and a deacon to speak for the corpse. Formosus, after being found guilty in death for largely political crimes was disrobed and put into peasant garb, had his blessing fingers cut off, and was weighted and thrown into the Tiber River. Stephen VI was publicly denounced, sent to prison, and shortly thereafter strangled. While a posthumous trial of a corpse arouses suspicion in most time periods, this particular synod reveals much about the place of Italian politics and the papacy during the 9th and 10th centuries. This poster will seek to explore the political motivations of the Cadaver Synod and identify the significant actors in such a bizarre circumstance. Many political families, such as the House of Spoleto, held significant sway during this period, and their use of the church as a means to gain influence reached its pinnacle with Pope Stephen VI. This level of corruption and influence is indicative of a broader portrait of Europe at the time, where the interconnectedness of daily life, economics, and politics with religion can be demonstrated, turning the story from a disgusting posthumous trial to a tale of political aspiration and attempts of dominance by the prominent houses of the time.

2E: The Renaissance: The advancement in Science & Technology

Phillip Preuss, Biology (Guatemala City, Guatemala)

The purpose of this research is to show how during the Renaissance era science and technology had great advancements. During this time, the idea of humanism favored the human-centered subjects, like

politics and history over the study of mathematics or physics. Nevertheless, great findings and advances occurred in many fields of science, such as geography, astronomy, chemistry, physics, mathematics, and others. By comparing the work of different scientists in this period of time, such as, Galileo Galilei, Leonardo da Vinci, Isaac Newton, etc., we can see the creativity and variety of advancements in many fields of science. When examining the work and inventions of these scientist we can observe how the principles of humanism, or the idea of the human being the center of the universe, directly influenced these great minds.

2E: New Atheism

Alec Welsh, Journalism (Pueblo, CO)

The purpose of this research is to evaluate the rise of the New Atheist movement in early 21st century America. After 9/11 prominent atheist scholars like Sam Harris and Richard Dawkins began advocating for atheist to be more vocal in their opposition to faith as an epistemology, and religion altogether. The more popular leaders of the New Atheist movement are known as the 4 Horsemen of the Non-Apocalypse and consist of Sam Harris, Richard Dawkins, Daniel Dennett, and Christopher Hitchens. This research also evaluates New Atheism in contrast with previous Atheist movements in the 1960's and the growth of New Atheism in mass media from book publishing, public debates, political aspirations, and legal foundations advocating for the separation of church and state.

2E: How Mental Practice Can Work for You

Abigail Silverberg, Performance Major, Piano Emphasis (Peyton, CO)

Mental practice in music is the cognitive rehearsal of the physical skill of playing an instrument and the mental memorization of a piece of music. There are many benefits to mental practice including: practicing anytime and anywhere, improving focusing skills, helpful in memorizing, learning new pieces quicker. There are several ways to apply mental practice to your daily routine. Mental practice is not just for musicians, however. Doctors use it to practice surgical procedures, and athletes use it as well. This presentation will help you to use mental practice in your specific discipline to its fullest potential.

2E: A Daring Leap: The History of the Great Friesian Horse and How it Impacted Europe

Divina Gallegos, History, Secondary Education emphasis (Pueblo West, CO)

The purpose of this poster is to uncover the reasons behind the involvement of the Friesian horse throughout Europe's history. These horses, also called Lippizaner stallions, are an important and beautiful part of European history that is continually overlooked. They are known for their beauty and agility as performing horses. Success relies on one of the deepest animal-human bonds in history, a tradition that has been passed down for centuries. The Lippizaners train for years at Vienna's Spanish Riding School to become top athletes. Each year a new generation aspires to join this elite group of perfectly choreographed performers. But beneath all the refinement and grace there still beats the willing heart of a war horse. The beauty, power, importance, and symbolism of these amazing animals will be presented. They are one of the oldest horse breeds in the world and have had a strong connection with the royalty of Vienna's past who kept extremely detailed records of five main bloodlines tracing back for hundreds of years. This poster will utilize information from National Geographic,

The Lipizzan Association of North America, PBS, Spanish Riding School Vienna, and other resources about the Lippizans.

2F: The Effect of Oxidative and Metabolic Stress on Alphavirus Infection

Kyle Boyd, Biology (Ashland, OH), *Erika Krow*, Biology (Pueblo, CO), *Sarah Tyler*, Biology (Overland Park, KS)

Alphaviruses are enveloped viruses, containing a single-stranded, positive-sense, RNA genome. This genus of viruses are predominantly arthropod-borne which are known to cause disease in humans, and replicate in the cytoplasm of the host. During Alphavirus infection, the infected cells show an increase in oxidative stress. Oxidative stress occurs when a biological system's ability to readily remove a reactive oxygen species and reactive intermediates is decreased, resulting in a buildup of damaging oxidants. Oxidative stress is induced in a wide variety of viral infections including dengue, west nile virus, and alphaviruses. This increased oxidative environment has been shown to actually enhance some viral infections. We are evaluating the impact of oxidative stress on Sindbis virus infection. We are also investigating the dependence of Sindbis virus (SINV) on glucose and glutamine and how this impacts the oxidative stress of the cell. Results from other experiments in this field have shown a correlated increase in pathogenesis with increased reactive oxygen species (ROS) and we are getting similar results. Our own experiments confirm that alphaviruses induce oxidative stress, with infected cells having significantly higher levels of oxidative stress than uninfected control cells. We are also seeing that this elevated oxidizing environment favors viral replication. Treatment of BHK cells with small amounts of hydrogen peroxide actually enhanced viral replication, while treatment with antioxidants inhibited viral replication. These results are very intriguing and future directions include analyzing the dependence of viral infections to oxidative stress.

2F: Analysis of the Mitochondrial Changes during Sindbis Virus Infection

Maxwell Sheedy, Biology (Bakersfield, CA), *Jessica Costlow*, Biology (Colorado Springs, CO)

Sindbis virus (SINV) is the prototype Alphavirus, which are positive sense single stranded RNA viruses. Alphaviruses infect millions of people each year resulting in rash, joint pain, headache, and even-encephalitis. There are limited treatment or preventative options to counteract the virus. Alphaviruses, like other viruses, take over the host cell and make dramatic changes to the cells normal physiology, including size and complexity. A better understand of how alphaviruses take over cells may lead to potential remedial targets and intervention methods. We have seen that the average size of infected BHK (baby hamster kidney) cells and HEK (human embryonic kidney) cells decreases during infection, while the overall cellular complexity remains about the same, or even slightly increases. When mitochondria are stained with mitotracker, we see an increase in mitochondrial staining in SINV infected cells. This may correspond with the increase and dependence on glycolysis which confirms previous publications. We are now looking to determine how exactly mitochondria are changing during Sindbis infection. We are investigating physical changes such as length and density, and also physiological changes such as ATP production. Gaining insight on how Sindbis virus manipulates mitochondria, may help explain molecular details on virus replication and may lead to the discovery of beneficial treatments or interventions that

can be used to inhibit viral infection.

2F: Is Buprenorphine the new Methadone?

Robert Didericksen, Psychiatric-Mental Health Nurse Practitioner (Pueblo, CO), *John Tripp*, Psychiatric-Mental Health Nurse Practitioner (Littleton, CO), *Faustina Mensah*, Psychiatric-Mental Health Nurse Practitioner (Centennial, CO), *Letitia Sam*, Psychiatric-Mental Health Nurse Practitioner (Centennial, CO)

Opioid use has been estimated at 15.5 million users' worldwide. Over 2.5 million Americans suffer from opioid use disorder which has contributed to over 28,000 overdose deaths in 2014. Currently in 2018, opioid overdoses cause 116 Americans to die daily. Opioid abuse, including heroin and prescription pain relievers, leads to neonatal abstinence syndrome and the spread of infectious diseases like HIV and Hepatitis. The guideline does not dictate how treatment is chosen and leaves it to provider judgement. The purpose of this study was to compare buprenorphine and methadone in the treatment of opioid addiction through evaluating retention rates and outcomes of relapse, retention, and death, providing a longitudinal view of medication efficacy. Current practice guidelines and research articles on buprenorphine and methadone were analyzed to determine their efficacy and validity. Results of the literature review strongly suggest that methadone results in higher retention rates throughout the continuum of care. Methadone also resulted in drastic increases of death along every time frame of treatment measured, particularly during initial induction and during the first four weeks following end of treatment. Methadone resulted in decreased symptomology early in treatment but tends to have an increase later in the maintenance phase. Higher initial doses of both medications were correlated with decreases in illicit substance use. All though further research is required to fully understand connections between population histories and medication use to determine the best safety and medication decision making, this study provides evidence about longitudinal patterns of outcomes for the Advanced Practice Registered Nurses (APRNs) to select appropriate treatment. Research into medication switching was not within the capabilities of this study.

2F: Opioid Dependence: Psychosocial Interventions and Treatment Compliance

Tina Nance, Psychiatric-Mental Health Nurse Practitioner (Colorado Springs, CO), *Alison Haddad*, Psychiatric-Mental Health Nurse Practitioner (Colorado Springs, CO), *Fnu Rajani*, Psychiatric-Mental Health Nurse Practitioner (Colorado Springs, CO), *Azra Van Hove*, Psychiatric-Mental Health Nurse Practitioner (Westminster, CO)

In 2017, the United States Health and Human Services department reported 2.1 million people had an opioid use disorder and an estimated 116 people were dying every day from opioid-related drug overdoses. These statistics have led to what is now referred to as the opioid crisis. Medications alone are insufficient to address this crisis. The purpose of this literature review is to determine if psychosocial therapy along with medication therapy is more effective than medication therapy alone for the treatment of opioid dependence. According to the Centers for Disease Control and Prevention, heroin death rates increased by 19.5% from 2015 to 2016. It is imperative advanced practice nurses identify adult patients with an opioid disorder using evidence to improve patient outcomes and decrease the burden of this

healthcare crises. The results of the literature review suggest that psychosocial interventions with any pharmacological therapy was shown to significantly reduce the rates of dropouts, use of opiate during the treatment, and clinical absences during the treatment. It would be beneficial to include psychosocial interventions in opioid treatment programs to assist these patients in being successful in the program. The findings suggest providers use psychosocial interventions along with medication therapy to treat the opioid addicted patient. Several different medications and psychosocial interventions were involved in these studies with similar results. The research studies within this review were gathered from the following databases: Cochrane Review (2008 to 2018), Pub Med (2008 to 2018), and Science Direct (2008 to 2018).

Search Methods: The research studies within this review were gathered from the following databases: Cochrane Review (2008 to 2018), Pub Med (2008 to 2018), and Science Direct (2008 to 2018).

Keywords: *Psychosocial Interventions, Opioid Dependence, Medication Therapy in Conjunction with Psychosocial Interventions, Treatment for Opioid Dependence, Treatment Compliance in Opioid Dependence*

2F: Neuro Trauma Treatment

Aja Petracca-Lennon, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo West, CO), *Sara D Campbell*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO), *Lindsey Dazzo*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO), *Brandi Trujillo (Martinez)*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Traumatic brain injury (TBI) is responsible for one-third of all trauma related deaths in the United States. Each year, 1.7 million people experience TBI. Of those, 52,000 die and 275,000 are hospitalized (Centers for Disease Control [CDC], 2018). The purpose of this study is to determine the influence that hyperosmolar therapy and decompressive craniectomy (DC) have on Extended Glasgow Outcome Scale (EGOS). The literature review revealed that hyperosmolar therapy has higher mortality rate, with lower rate of disability. The reverse can be stated about the decompressive craniectomy; patients have a higher rate of survivability, but also higher rates of life-long disability. The results suggest that patients who have suffered TBI require judicious treatment to maintain intracranial pressure (ICP) levels. The use of both pharmacological and surgical interventions is common; however, evidence is limited on which interventions reduce disability and increase survivability. These treatments are often used in conjunction and the guidelines have minimal recommendations and prioritization of treatments seen in practice. Advanced Practice Nurses who specialize in Neuro-Trauma Intensive Care must continue to analyze, adopt, and support current evidence-based research, to improve patient outcomes, decrease disability and mortality. The adoption of current evidence-based practice is imperative to initiate appropriate therapy as soon as possible. We concluded from the literature review that treatment with hyperosmolar solutions shows benefit in short-term reduction of ICP, but there is no substantial evidence to support improvement in outcomes. Conversely, DC has greater survivability, but also greater degree of disability measured by EGOS.

Keywords: *Hyperosmolar therapy, increased intracranial pressure, traumatic brain injury, decompressive craniectomy*

2F: Creation and Application of a New qPCR Technique Specific to a Turtle Mycoplasma

Rachel M. Ruiz, Biology (Arvada, CO)

The main objective of this project was to create and test an assay to detect a unique species of Mycoplasma found in emydid turtles. The assay was created using the DNA sequence of the 16s-23s ribosomal RNA intergenic spacer, deposited in GenBank (accession number KJ623617) (Ossiboff et al. 2015). BLAST searches (NCBI) were used to test potential DNA sequences that could be amplified by primer/probe sets for specificity to this Mycoplasma. We also tested the chosen primers/probe set against closely related species of microbes (*M. agassizii* and *M. testudineum*) and against other common microbes that may be present in nasal lavages in actual qPCR reactions. Plasmid serial dilutions of 5000000000 to 5 copy numbers were used to determine a detection limit of 500 copies and a replication efficiency of 97.51%, at an optimal annealing temperature of 58.8°C. The assay was used to run qPCRs on lavage samples from three-toed box turtles (*Terrapene carolina triunguis*) from the Wildlife Rescue Center in Ballwin, MO and ornate box turtle (*Terrapene ornate ornate*) found at the Pueblo Chemical Depot in Pueblo, CO. The assay detected 17 positive samples from a sample size of 47. All 17 positive samples came from three-toed box turtles.

2F: CB2 Mediated Antiviral Activity in Hepatocytes

Joseph Lopez, Biology (Pueblo, CO)

Alphaviruses are small, spherical, enveloped, single stranded positive-sense RNA viruses responsible for a substantial range of human and animal diseases. Viral infection can cause arthritis or encephalitis, resulting in a significant medical burden. Furthermore, Alphaviruses have spread rapidly due to the globalization of their mosquito vectors and have become a global health concern, exemplified by the recent Chikungunya virus outbreaks in South and Central America. All viruses are obligate cellular parasites that require host cell machinery to generate progeny. They accomplish this by hijacking the host cells physiological pathways, which have drastic consequences on both viral replication and cell viability. Cannabinoids are endogenous lipid mediators that exert many of their effects through cannabinoid receptor-1 (CB1) and cannabinoid receptor-2 (CB2). Interestingly, exogenous cannabinoids and many synthetic CBR specific agonists and antagonists have been implicated in many cellular and systemic host responses; resulting in significant research and development regarding CBRs as possible therapeutic interventions. Specifically, CBR activity may modulate ideal cellular pathways to significantly impact viral replication. We have previously reported the antiviral impacts associated with CB1 agonists and antagonists ACEA and AM-251, respectively. In our current study, we have expanded the project to include CB2 selective agonists (AM-1241, SR-144-528) to determine their impact on alphavirus replication. We hypothesize that the CB2 receptor activity will directly modify host cell physiology, significantly impacting viral replication. This project attempts to provide additional information pertaining to the use of medicinal cannabis against viral infections and the results will add to the knowledge base in fields within the academic, cannabis, virology, and public health communities.

2F: American Intervention in Laos: A Conflict in the Shadow of Vietnam

David Armstrong, History (Colorado Springs, CO)

This research focuses on American aid to the Royal Lao Government from 1955 to 1975. The intention of this research is to highlight the little, or unknown, endeavors of the American government during the Vietnam conflict and inform people on something else of importance during the 1960s. Modern history focuses on issues such as the Vietnam conflict and the civil rights movement in America in the 1960s and do not touch on other important aspects of America's actions. The focus on these two areas draws attention away from historical events that could otherwise help people to understand the accomplishments of the United States government, military, and the CIA. Research indicates that the United States helped bring an end to the Laotian Civil War and the establishment of a representative Laotian government after over twenty years of conflict in Laos. Congressional hearings on U.S. intervention in Laos started in 1969 as the country's criticism of the role in Vietnam grew. Until that time the United States' role in Laos had been considered a "non-attributable war" by former CIA Director William E. Colby. This caused it to become an unknown American conflict. It is the aim of this research to bring a new topic to the 1960s and allow American happenings to emerge from the shadows of the Vietnam conflict and domestic American political debates.

2F: Alterations to mitochondrial metabolic pathways during cannabinoid activation of CB1 receptors within Human Hepatocytes

Juan L. Rodriguez, M.S. Biology (Colorado Springs, CO)

The endocannabinoid system is found throughout the entire body and comprises endocannabinoid ligands, cannabinoid receptors, and biochemical enzymes for their synthesis and degradation. In previous work, cannabinoid receptors have been found throughout the body including the liver. Activation of these CB receptors results in significant changes to cellular pathways. Interestingly, the CB1 receptor was previously thought to only be present at the cellular membrane, but it is becoming apparent that CB receptors also exist on the mitochondrial membrane where interactions with ligands can mediate a rapid response on cellular respiration. CB1 ligands are lipid-derived compounds which regulate processes such as gluconeogenesis, fatty acid oxidation, and oxidative stress. Arachidonyl-2'-chloroethylamide (ACEA) an agonist and AM-251 an inverse agonist are synthetic CB1 ligands. The powerhouse of the cell is notably the mitochondria that supply the energy demand of the cell. Mitochondria dysfunction can be induced with changes to cellular physiology relating to loss of electron transport chain maintenance with decreased electrical transmembrane potential in the inner mitochondrial membrane, altered electron transport function, and reduced energetic metabolites abilities to cross the mitochondrial membrane. Dysfunction is measured by the reduced oxidative phosphorylation process with low levels of ATP produced. In our study, we aimed to evaluate human liver hepatocytes (HuH7.5 cells) and measure how cannabinoid activation alters bioenergetic changes in basal respiration, maximum respiration, non-mitochondrial respiration, ATP production, coupling efficiency, proton leak and spare respiratory capacity with treatments at 100nM ACEA and AM-251. Using an Agilent Seahorse XFe24 real-time metabolic analyzer, we found evidence of modified mitochondrial function in

cannabinoid-treated HuH7.5 cells. Procedures were done to inhibit the electron transport chain while monitoring oxygen consumption rate and extracellular acidification rate in real-time. Mitochondrial pathways were targeted unwinding responses from CB1 activation with two synthetic compounds. Basal respiration, maximum respiration, and ATP production had a higher rate during treatment with both ACEA and AM251. Increased levels of ATP production demonstrate the energy demand needed from the mitochondria supplying CB1 induced pathways. CB1 activation with ACEA and AM251 had altered effects on the mitochondria changing cellular physiology.

2F: Development of an efficient method for the isolation of cannabinoids from bulk industrial hemp

Collin Arellano, Chemistry (Pueblo, CO)

This project focuses on the development of an efficient method for separation of individual cannabinoids, with emphasis on isolation of cannabidiol (CBD), from bulk extract prepared by pressurized liquid extraction (PLE) of industrial hemp. Industrial hemp has been classified as having no more than 0.3% Δ^9 -tetrahydrocannabinol (THC) by Senate Bill 241. An extraction method by PLE optimized to maximize the quantity of CBD recovered was recently developed. The bulk extract generated contains a mixture of cannabinoids and other phytochemicals. With an efficient method for extracting CBD using PLE, the next step is isolating CBD and other individual cannabinoids from each other and other phytochemicals. Initial separation parameters were established using silica gel TLC plates with different solvent mixtures. A mixture of hexanes and diethyl ether provided the best separation. With this information, we attempted to separate the PLE extract by flash chromatography using a silica column. This resulted in the extract being separated into cannabinoids and what appeared to be chlorophyll and potentially other phytochemicals. The resulting extract containing chlorophyll was discarded while the mixture of cannabinoids separated by flash chromatography using a C18 reverse-phase column to maximize isolation of CBD from the other cannabinoids.

2F: Co-infection with *M. agassizii* and *P. testudinis* and its effect on Upper Respiratory Tract Disease in the Mojave Desert Tortoise

Kendra Leonard, Biology (Troy, IL)

Some species of *Pasteurella* are known to cause disease in vertebrates, often within the respiratory system, and in association with *Mycoplasma*. While *Mycoplasma agassizii* is a known etiologic agent of upper respiratory tract disease (URTD) in the Mojave Desert tortoise (*Gopherus agassizii*), the effect of *Pasteurella testudinis* on URTD in wild populations is not known. Understanding the dynamics of co-infection of *P. testudinis* and *M. agassizii* may allow for improvement in conservation efforts, especially regarding URTD management during necessary translocations. A hydrolysis probe (TaqMan) quantitative polymerase chain reaction (qPCR) for *P. testudinis* was developed to detect the presence or absence of *P. testudinis* in DNA extractions from tortoise lavage samples that were collected from tortoises (n = 389) in the Mojave Desert from 2010-2012. In 20 sampled populations, the prevalence of *P. testudinis* ranged from 0-100%, with a mean of 53% of individuals colonized with the microbe. Co-infection occurred at a low rate (103/389), and *P. testudinis* was not correlated to *M. agassizii* or URTD. While previous studies have found *P. testudinis* in association with disease, we found no indication that the presence of *P. testudinis* worsens URTD. However, co-infection

with *P. testudinis* is associated with increased infection intensity of *M. agassizii* in the Mojave Desert tortoise.

3A: Experiential Education 101: A Journey that Leads to a Better Future for College Students

Keragan Ettleman, English (Colorado Springs, CO), *Ricardo Octavio*, Business Management (Pueblo, CO), *David Sanchez*, English (Pueblo, CO), *Hayley Pantleo*, English (Pueblo, CO)

This four-person panel will first provide a historical overview of the two most commonly applied experiential education theories, including John Dewey's theory in his novel, *Experience and Education*, and David A. Kolb's *Experiential Learning Theory*. Next, various benefits of experiential learning will be compared to problems the dominant traditional lecture-based learning continually faces, as the EE benefits will enhance any future interaction both personally and professionally for students and employers alike. After outlining the benefits of experiential education, existing research will be discussed related to experiential education and its effect on decision making, as well as different decision-making methods that include dialectical inquiry, devil's advocacy, and consensus approaches to group strategic decision making. Finally, the panel will conclude by detailing the need for Colorado State University-Pueblo to make experiential learning a requirement for business management majors, with the support of a random sampling of job postings for business management openings in the top-3 job boards, which will be conducted, in order to determine what percentage of these job postings require an internship and/or work experience. Panelists will infuse their theoretical discussions with auto-ethnographic narrative accounts based on their involvement in an experiential education-centered class that focused on creating and implementing an integrated marketing campaign.

3B: Emergent reversal of warfarin in geriatric patients with intracranial hemorrhage

Amanda Spaak, Adult/Gerontology Acute Care/Family Nurse Practitioner (Severance, CO)

Aim: To determine if prothrombin complex concentrate (PCC) decreases internationalized ratio (INR) faster than fresh frozen plasma (FFP) in geriatric patients on warfarin with intracranial hemorrhage. **Background:** In the United States, every second, every day an older adult falls. Falls in a geriatric patient can be associated with poor outcomes or loss of independence. Many geriatric patients require the use of anticoagulants including warfarin for prevention of thrombus formation or for maintenance of a mechanical heart valve. The combination of increased falls in this population and higher incidence of warfarin use may be associated with intracranial hemorrhage. **Theory:** Betty Neuman's system theory addresses the patient as an open system that responds to stressors whether they are actual or perceived. The theory aides the practitioner in diagnosing and treating the patient holistically while remaining dynamic in decision making. **Methods:** Utilizing translational research process, a literature review using CINAHL the keywords geriatric trauma, intracranial hemorrhage, warfarin reversal, PCC, and FFP was conducted. The author has completed NIH training with active certification. **Results:** Although current studies have a small sample size, when comparing FFP to PCC, PCC is superior at providing quicker decrease of INR, which is imperative to treatment in the geriatric patient with intracranial hemorrhage. Current guidelines suggest using PCC for reversal of warfarin. **Implications:** The

nurse practitioner caring for the geriatric patient on warfarin with an intracerebral hemorrhage should recognize this problem as a medical emergency. The practitioner should utilize current practice guidelines and administer PCC to this patient population to obtain the best patient outcomes.

Keywords: *geriatric trauma, intracranial hemorrhage, warfarin reversal, PCC, FFP*

3B: Ketofol (Ketamine and Propofol) Versus Propofol Alone During Procedural Sedation

Kaitlin Veselicky, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

Aim: The objective of this literature review is to determine if ketofol, the combination of propofol and ketamine causes less hypotension in adult patients undergoing procedure sedation in the emergency department. **Background:** Procedural sedation is a common occurrence in emergency departments when performing painful and anxiety producing procedures such as reducing dislocations from an orthopedic injury. Propofol and ketamine are the most commonly prescribed medications for procedural sedation, however, each medication has risk for adverse reactions. Propofol is known to cause a sudden drop in blood pressure resulting in hypotension and respiratory depression, while ketamine can cause delirium, nightmares, and vomiting. **Method:** A translational research using a literature review design was performed by an advanced practice nursing student with an active certificate by the National Institutes of Health Office of Extramural Research. Studies were pulled from CINAHL. **Results:** Based on the randomized control studies and a systematic review, ketofol has less risk for hypotension than propofol. The advanced practice nurse (APN) utilizes Sister Simone Roach's Meaning of Caring to show compassion, competence, conscience, confidence, commitment, and comportment when ordering ketofol at a dose of 0.75 mg/kg for propofol and ketamine mixed in a single syringe as an alternative to propofol to decrease the risk of hypotension.

3B: Curcumin and Alzheimer's Disease

Alexis Lichvar, Adult/Gerontology Acute Care/Family Nurse Practitioner (Westminster, CO)

5.4 million Americans were diagnosed with Alzheimer's Disease (AD) in 2016 and AD has accumulated over 100 billion health care dollars each year in the United States (U.S.). Curcumin use in animal studies has shown potential to prevent or reverse certain aspects of AD. Curcumin treated macrophages in animal and human studies showed increased amyloid beta plaque uptake. This study will attempt to determine if in elderly patients with Alzheimer's Disease (P) how does advising use of curcumin (I) compared to not advising use of curcumin (C) influence the mini mental status exam (O) with in one year (T)? Translational research process using a literature review design from CINAHL, PubMed, and Google Scholar were used, as well as key terms: Alzheimer's Disease, Curcumin, and older adults. NIH training was completed with active certification. A systematic review of two RCT and three case studies revealed no statistically significant changes in the MMSE scores of AD patients taking curcumin for six months. One RCT showed improvement ($p=0.030$) in cognition in those older adults with out dementia taking Longvida 400 mg daily over 4 weeks. While curcumin use in mild Alzheimer's Disease appears

to be safe, larger human studies are needed to further determine it's efficacy in AD.

3C: Endovascular Thrombectomy vs Tissue Plasminogen Activator for Acute Ischemic Stroke

Amy Millsap, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

Ischemic stroke causes 5.7 deaths annually, those that survive ischemic stroke are at high risk for major disability. Current practice guidelines recommend Tissue Plasminogen Activator (TPA) for the treatment of ischemic stroke in adult patients although there are strict time constraints and contraindications that leave many with supportive care as their primary medical treatment. New improvements with endovascular thrombectomy (ET) for ischemic stroke has shown promising, significant results ($p < 0.001$) that translate to better patient functional outcomes after 90 days in comparison to TPA. The Advanced Practice Nurse (APN) caring for the patient with an acute ischemic stroke will use a culmination of evidence based practice, practice guidelines, nursing theory and APN competencies to formulate a holistic treatment plan. The purpose of this presentation is to utilize translational research using a literature review design and discuss results found based on an extensive literature review comparing effectiveness of TPA versus ET for an acute ischemic stroke within the adult patient. NIH training and certification was completed for the purposes of this research study.

3C: Venous Thromboembolism Prophylaxis

Kim Huynh, Adult/Gerontology Acute Care/Family Nurse Practitioner (Denver, CO)

Aim: To determine if the use of betrixaban versus enoxaparin in acute medically ill patients would influence hospital readmission rates related to venous thromboembolism (VTE) within 45 days after discharge. **Background:** VTE is the most common cause of preventable death in the hospital. An average of 5% to 10% hospital death resulted from VTE. More than 50% of acute medically ill patients are at risk of developing VTE during hospitalization and prolonged post discharge. **Theory:** Roy's Adaptation Model (RAM) viewed the human body as an adaptive system that constantly changing in response to internal and/or external stressors. There are multiple stressors affecting the acute medically ill patients that influenced their ability to adapt. **Methods:** NIH modules were completed and a translational research approach was utilized to obtain literature reviews via CINAHL and Cochrane databases with keywords: VTE prophylaxis, acute medically ill patients VTE, Betrixaban versus enoxaparin, and VTE guidelines. A randomized control trial (RCT) with 7,513 participants was reviewed. Results: Current research indicated a significant ($p=0.006$) decrease in VTE related hospitalization using betrixaban. **Implications:** Both the American College of Physicians in 2011 and the American College of Chest physicians in 2012 VTE guidelines recommended for acute medically ill patients at risk for VTE should be placed on pharmacological prophylaxis. The nurse practitioner should apply guidelines and current research to prevent VTE in acute medically ill patients and prevent re-hospitalization related to thrombus.

3C: Ambient Air Versus Adjunct Oxygen in Normoxic ST-Elevation Myocardial Infarction

Abigail Saldua, Adult/Gerontology Acute Care Nurse Practitioner

(Crawford, TX)

Supplemental oxygen therapy has been a standard of care for all suspected myocardial infarctions (MI) since early in the 20th century (Rawles & Kenmure, 1976). Recent studies have raised skepticism about its efficacy, as well as potential for harm. Adults presenting to the emergency department with ST-elevation myocardial infarction without hypoxia, with ambient air versus oxygen as an adjunct therapy, were studied with transitional research using a literature review design. Infarct size was measured as the clinical outcome. Research indicates that infarct size is increased in groups that receive oxygen. Most studies have high levels of variability and low quality of evidence. Current research cannot confirm or refute the practice of routine oxygen use in normoxic patients. Because of the potential for harm, oxygen should only be given in cases of hypoxia or respiratory distress. It is concluded that further clinical trials are crucial for future clinical guidelines (Cabello, Burls, Emparanza, Bayliss, & Quinn, 2016; Stub et al., 2015; Wijesinghe et al., 2008).

4A: Aging Out; An Overview of Aged Out Foster Youth in Colorado

Hannah Large, Social Work and Honors (Lakewood, CA)

An average youth, who enters the foster system, spends roughly 1 to less than 2 years in foster care. At age 18 a young adult ages out of the foster care system. Expectedly, those who enter foster care in their late teens have a higher chance of aging out of the system before they can be placed in a forever home. In 2015, more than 20,000 young adults aged out of the system without ever securing a forever home. Studies have shown that those who have aged out of foster care have a lower score of decision-making skills compared to those who were not in foster care and have a higher chance of becoming homeless. Currently Posada of Pueblo County provides multiple resources for those who are homeless or are in need of basic resources. This presentation will highlight the plight of youth aging out of foster care and what resources are provided for them in Pueblo, Colorado.

Keywords: foster care, adoption, homelessness, helplessness

4A: Live Healthier, Happier, and Longer: An Overview of Research on Benefits of Communication

J. Paul Bizzell, Communication (Pueblo, CO)

Drawing on current results of Harvard's unparalleled, exhaustive eighty-year Study of Adult Behavior conducted by numerous researchers, as well as analogous conclusions from Pinker's (2014) *The Village Effect*, this presentation displays the wide-ranging benefits of healthy relationships and frequent face-to-face communication. Furthermore, using M.E.P. Seligman's groundbreaking research (2011) this presentation identifies and illuminates paths that one can take to indeed achieve a healthy, happy, and longer life. Using an auto-ethnographic approach, I will conclude with personal experiences that illustrate how the above research and concept applications play out in real life.

4B: Screening for Osteoporosis in Men

Bethany Caton, Adult/Gerontology Acute Care/Family Nurse Practitioner (Alamosa, CO)

Osteoporosis is a disease of the bone where the density of bone is decreased and can decrease to the point of fracture. Unfortunately, a sequela of fracture in older men and women is increased mortality. Men, however, have a higher mortality rate following hip fracture

than women (Cass, Shepherd, Asiro, Mahajan, & Nizami, 2016). It is important for the Advanced Practice Nurse (APN) primary care provider to identify patients at risk for osteoporosis. While most of those diagnosed with osteoporosis are women, osteoporosis is a significant problem in men as well. For example, in 2010, 16.1 million men in the United States had osteoporosis. The APN primary care provider has an ethical obligation to understand the disease and the opportunities for prevention. Aim: to determine in men over age 65, if the MORES (Male Osteoporosis Risk Estimation Score) tool is more accurate than the FRAX (Fracture Risk Assessment Tool) in screening for osteoporosis. The "Levels of Prevention" model is used to guide the APN in screening for osteoporosis (Models, 2012). Method: The National Institutes of Health (NIH) training in "Protecting Human Research Participants" was completed. Investigation of this topic was carried out with translational research using a literature review design. Four studies were examined. Results: The MORES is a sensitive simple screen for men at risk for osteoporosis, while FRAX is an online calculation, but more specific. Implications: While more evidence is needed, the evidence that is available indicates that the APN can use the simple MORES tool to identify the man at risk for osteoporosis while the FRAX would be helpful to use in conjunction.

4B: A Heuristic-Based Review of the Usability of the OSHA Website with respect to Communication Tower Hazards

Aiman Al-Allaq, Engineering/Mechatronics (Pueblo, CO)

A heuristic review of the usability of the OSHA website with respect to OSHA regulations and other information on Communication Tower Hazards was completed. The heuristics employed in this analysis were Jakob Nielsen's "10 usability heuristics for user interface design." A summary of the evaluation according to these 10 heuristics is shown below. The reader is referred to the hyperlink included below for the ten heuristics.

Site flexibility and ease of use. Taking into consideration all the previous aspects and measuring heuristics we used, to certain extent, the site can be deemed to be fairly flexible and easy to use, again, in part due to its limited focus and functionality. With few user interaction options available, not much can be done in that regard. However, using the same control parameters used by the OSHA website (tap selection, list choices, and content navigation controls) on a "heavier traffic" website, it is very probable that the site will do somewhat poorly, since it doesn't cater to "all" users (at least in terms of displaying the information in different industry-based context).

The site tries to keep a minimalistic design that agrees with the content it displays, however, there are some "repetitive" options that could be highlighted in different way, increasing the site functionality.

This can be considered as a "Bad design" feature, and, eliminating repetitive options could lead to better utilization and elevate user confusion.

Lastly, no "help and documentation" is critically needed, due to the site's limited purpose and functionality.

4B: A Heuristic-Based Review of the Usability of the OSHA Website with respect to Radiation Hazards

Joseph Vigil, Industrial Engineering (Pueblo, CO)

A heuristic review of the usability of the OSHA website with respect to OSHA regulations and other information on radiation hazards was completed. The heuristics employed in this analysis were

Jakob Nielsen's "10 usability heuristics for user interface design." A brief summary of the assessment of how well or poorly the portion of the OSHA website dealing with radiation hazards complies with the ten heuristics is shown below. The user is referred to the hyperlink included below for the ten heuristics.

- The system keeps user informed on where they are in the website and what each click will lead them to. Sections labeled, but lots of prior knowledge still needed to navigate.
- The website is written for a lawyer, or someone already familiar with laws/sections/standards of radiation. It is hard for newcomers to find out how much radiation they can be exposed to or its effects.
- The user can easily go forward and backward through sections using the built in browser functions and website hierarchy.
- It is not always known where a link will take you.
- Lots of errors will be made as users will have a difficult time finding answers to their questions. The answer probably exists on the website; it is just difficult to find their location.
- The website does not require the user to exceed their memory load.
- The website contains no accelerators to my knowledge, besides responding quickly.
- The website is probably too minimalistic for my liking. It has the look of a site designed ten years ago. Some graphics are used in larger sections, but smaller ones just contain text.
- The website does not provide assistance to recognize when the user may have followed a wrong link, but it does provide a consistent set of tabs with pull-down menus from most pages.
- No navigation documentation is provided by the website, it is meant to be intuitive.
- <https://www.nngroup.com/articles/ten-usability-heuristics/>

4C: Timing of PEG tube placement and nutritional status in head and neck cancer

Andrea Good, Adult/Gerontology Acute Care/Family Nurse Practitioner (Evans, CO)

Head and neck cancer (HNC) is defined as a rare cancer with having an incident rate of less than six cases per 100,000 people. In 2017, there will be an estimated 51,540 newly diagnosed cases and about 10,030 people will die from this type of cancer. As with all cancers, proper nutrition is often difficult to maintain due to treatment side effects and the increased caloric demand their body requires for repair. In about half of those treated for HNC, altered nutrition occurs because of side effects such as but not limited to mucositis, xerostomia, dysphasia, and nausea. Often supplementation is necessary and often accomplished by a percutaneous gastrostomy (PEG) to preserve gastrointestinal function. Where the discussion tends to differ is the timing of PEG placement, either prior to treatment (prophylactic) or when required (reactive) due to malnutrition and weight loss. Through the development of a PICOT question and case study, this presentation will assess the most recent research on the use or nonuse of PEG tubes in patients being treated for HNC. Evidence was obtained through translational research using a literature review design and in accordance with the National Institutes of Health (NIH) Office of Extramural Research on Protecting Human Research Participants certification. King's Theory of Goal Attainment nursing process steps of assessment, diagnosis, planning, implementation and evaluation

will be used to guide the patient's treatment approach. The National Comprehensive Cancer Network (NCCN) guidelines for HNC does not recommend prophylactic PEG tube placement in patients with very good performance status, having no significant pretreatment weight loss, significant airway obstruction or severe dysphasia. Their recommendation is careful monitoring of caloric intake and weight throughout and after treatment with consideration of nutritional supplementation via reactive PEG tube placement.

4C: N.A.S.H.

Christine Bohannon, Adult/Gerontology Acute Care/Family Nurse Practitioner (Denver, CO)

Non-alcoholic fatty liver disease (NAFLD) is an umbrella term that encompasses liver dysfunctions such as simple steatosis, progressive steatosis, and steatosis in conjunction with hepatitis, fibrosis, cirrhosis, and hepatocellular carcinoma. This associated liver dysfunction develops without a significant alcohol consumption history. NAFLD is becoming a growing epidemic worldwide. The aim of this paper is to show the relationship between NAFLD and metabolic syndrome. This paper's goal is to provide a connection to patients with metabolic syndrome and their high risk of developing NAFLD. Methods: NIH training for IRB completed in accordance institution protocol. A detailed literature review was performed in the databases PubMed and Cochrane from 2008 to 2018. Relevant research articles were chosen and evaluated for related applicable content. Research design incorporated a translational research using a literature review design. Results: This literature review revealed an increase in the occurrence of NAFLD and its associated risk factors related to metabolic syndrome; such as obesity, insulin insensitivity, and hyperlipidemia. The link between metabolic syndrome and NAFLD is an important component, which can help providers to recognize at risk patients.

4C: A New Approach to an Old Problem: Proprotein Convertase Subtilisin Kexin 9 Inhibitors

Jamison Lester, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO)

Atherosclerotic cardiovascular disease (ASCVD), the leading cause of death in the developed world, effects 15.5 million people in the United States every year. In 2016 approximately 774,000 people died from heart disease and stroke (CDC). Controlling cholesterol, specifically low density lipoproteins (LDL), has been shown to lower the risk for developing ASCVD. Statins have been first line drugs in preventing ASCVD for over 25 years, although up to 20-25% of patients discontinue statin use due to intolerance. Furthermore, some patients do not achieve LDL reduction goals on statins alone. In the last two years new a medication class, proprotein convertase subtilisin kexin 9 (PCSK9) inhibitors, have been developed to treat high LDL levels. This presentation seeks to explore the efficacy and safety of this new class of drug. Translational research using a literature review design was utilized for this presentation after a National Institute of Health Clinical Research Training Certificate was obtained. Research articles from Google Scholar, CINAHL, Cochrane, and PubMed with keywords: proprotein convertase subtilisin kexin 9, PCSK9, and statin were gathered and analyzed for this presentation. These new medications in combination with maximally tolerated statins have been shown to reduce LDL levels by as much as 50% ($p < 0.001$), reduce total cholesterol by 31% ($p < 0.001$), and to reduce the risk for

heart attack and overall death ($p = 0.03$; $p = 0.015$). In addition, PCSK9 inhibitors have relatively few side effects, most of which are not serious. This presentation discusses the current research and reviews how PCSK9 inhibitors can be used to safely and effectively reduce the risk for ASCVD.

Keywords: proprotein convertase subtilisin kexin 9 inhibitor, PCSK9 inhibitor, cholesterol, low density lipoprotein, statin, atherosclerotic cardiovascular disease

4D: The Effects of Political Rhetoric on Refugee Policy and Communities in the United States and Germany

Eliana Taylor, Political Science and Honors (Monument, CO)

International events today put into light the role of rhetoric and the impact on the development of government policies. One of the most prevalent international focuses on policies are those that deal with refugees. This paper analyzes the United States and Germany's refugee policy over the last decade to analyze the trends and potential future for refugee policy.

Keywords: international, refugee, rhetoric, United States, Germany

4D: The Economic Destruction of Stalin's Gulag

Dawn Carver, History (Orangevale, CA)

This paper focuses on the changes to the Gulag system from the economically successful leadership of Vladimir Lenin to the economic destruction caused by Joseph Vissarionovich Stalin. The opening of the Soviet Archives in 1991 has allowed historians access to an abundance of material on Soviet history, most notably, the policies and people who were a part of the Gulag system either as prisoners or administrators. This paper relies on primary sources obtained from the Soviet Archives and the social and economic interpretation of the material by notable academics such as Anne Applebaum, Galina Mikhailovna, Donald Rayfield and the combined work of Leonid Borodkin and Simon Ertz. The culmination of their works paints a picture of the rise and fall of the Gulag system, how it operated, and what eventually caused its downfall. The early Gulag system, or Main Administration of Corrective Labor Camps and Settlements, was arguably successful at containing political dissidents and being self-sustaining under Lenin's rule and into the early reign of Stalin. So what changed within the operation of the Gulag system that led to decreased productivity of the prisoners and to the eventual financial ruin of the system? The Soviet archives show that there was widespread corruption within the camp administration that destroyed worker productivity. There was also a sustained and deliberate interference from Stalin that disrupted construction schedules and wasted the human commodity on dangerous and pointless projects. Stalin's micro-management forced the Gulag system to make inane changes to day-to-day operations and long term construction projects that would have eventually led to the total financial collapse of the system if Stalin had not died in March of 1953.

4D: The Reactions and Changes in Attitudes to Different Types of Political Advertisements

Mikala Morris, Mass Communications (Integrated Communications), Political Science and Spanish (Tempe, AZ)

Political advertising for presidential elections began its evolution in 1952 and continues to be a major influence on the American public today. Although these advertisements changed significantly over a period of more than sixty years, there remains a lack of Spanish polit-

ical advertisements or an effort by the candidates to reach the Spanish-speaking population. As the advertisements became more concise, negative and graphic overtime, minimal existing research discusses the ramifications of these shifts in the young voting population and specifically, those that speak Spanish. "The Reactions and Changes in Attitudes to Different Types of Political Advertisements" analyzes the effects of CSU-Pueblo students watching sponsor-positive, opponent-negative and comparative political advertisements. The students participated in an extended focus group, which was approved as a research study on February 2, 2018 by George Dallam, the CSU-Pueblo IRB Chair. In the study, the students took a survey asking about their political knowledge and preferences, watched a series of 8-10 political advertisements and took part in a group discussion about the advertisements and the consequences of them being viewed by the general American public over short and long periods of time. Results showed that first, the answers given by students before and after watching the advertisements did not differ and second, the difference in negativity towards the advertisements by Hispanic and non-Hispanic students was insignificant. Despite whether the ads were sponsor-positive, opponent-negative or comparative, the CSU-Pueblo students held an overwhelmingly negative view of political advertisements and how they infiltrate modern American political culture.

4E: Septic Protocol Use vs Non-Use of Septic Protocol Effects on Mortality

Dalia Holguin, Nursing (Denver, CO), Aubrey Urban, Nursing (Denver, CO), Daniel Kyle, Nursing (Boise, ID), Melissa Navarrette, Nursing (Lamar, CO), Heather Fortner, Nursing (Colorado Springs, CO), Heather Templeton, Nursing (Colorado Springs, CO), Shatiya Wright, Nursing (Colorado Springs, CO)

See abstract in 1E.

4E: Does mobilizing ventilated patients lead to better patient outcomes than waiting until extubation to mobilize?

Tami Jo Hentschermann, Nursing (Colorado Springs, CO), Travis Ford, Nursing (Colorado Springs, CO), Laura Frieditis, Nursing (Colorado Springs, CO), Mandy Smith, Nursing (Pueblo West, CO), Phainis Onyango, Nursing (Arlington, Texas), Carisa Medina, Nursing (Mountainview, CA), Cherry Evans, Nursing (Colorado Springs, CO)

See abstract in 1E.

4E: Cannabis: An Effective Alternative for Managing Chronic Pain

Justina Gonzales, Nursing (Pueblo, CO), Ofelia Sifuentes, Nursing (San Antonio, Texas), Roy Cerda, Nursing (North Las Vegas, NV), George Miller, Nursing (Colorado Springs, CO), Carly Rey-Hayes, Nursing (Pueblo, CO), Alyssa Wyberg, Nursing (Fairfield, OH), Kelly Zandbergen, Nursing (Colorado Springs, CO)

See abstract in 1E.

4E: First Time NCLEX Success

Stevi Krier, Nursing (Strasburg, CO), Hallie Greene, Nursing (Aurora, CO), Kayleigh Guadagnoli, Nursing (Pueblo, CO), Kelly Johnson, Nursing (Woodland Park, CO), Kaleb Hansen, Nursing (Lamar, CO), Kaela Becker, Nursing (Fountain, CO), Kaitlin Crowley, Nursing (Pueblo, CO)

See abstract in 1E.

4E: Transdermal Aromatherapy: An Emerging Solution to Chronic Pain Management

Jessica Eaton, Nursing (Pueblo, CO), Dora Agyeman, Nursing (Longmont, CO), Huria Tossa, Nursing (Denver, CO), Geoffrey Kipkoech, Nursing (Eldoret, Kenya), Leah Bost, Nursing (Colorado Springs, CO), Bryli Klipfel, Nursing (Rye, CO), Isabel Taylor, Nursing (Monument, CO)

See abstract in 1E.

4E: Influenza Vaccine: live attenuated immunization versus inactivated immunization

Tristan Strickland, Nursing (Colorado Springs, CO), Mike Williams, Nursing (Pueblo, CO), Alli Wurscher, Nursing (Tigard, OR), Lexi Latika, Nursing (Pueblo, CO), Eryn Salinas, Nursing (Colorado City, CO), Kaylie Margison, Nursing (Pueblo, CO), Ashlee Hanavan, Nursing (Pueblo, CO)

See abstract in 1E.

4E: A Review of the Effectiveness of Needle Exchange Programs in Decreasing the Incidence of HIV Transmission Within Studied Populations

Matthew Leberknight, Nursing (San Jose, CA), Caitlin Weaver, Nursing (Davenport, CA), Sahaja Lohith, Nursing (Mountain View, CA), Kelly McLean, Nursing (Pueblo, CO), Rebecca Ketchum, Nursing (Watertown, NY), Janine Dillaha, Nursing (Pueblo, CO), Daniel Townzen, Nursing (Rogers, AR)

See abstract in 2D.

4E: Under Pressure: The Use of Pressure Relieving Mattresses

Leslie Roberts, Nursing (Canon City, CO), Aubrianne Lewellen, Nursing (Franktown, CO), Shannon Pedzinski, Nursing (Canon City, CO), Rose McMurry, Nursing (Lakewood, CO), Lisa Muff, Nursing (Westminster, CO), Savannah Nicks, Nursing (Pueblo, CO), Curtis Bennett, Nursing (Pueblo, CO)

See abstract in 2D.

4E: Robotic or redundant: a comparison study review of the da Vinci Surgical System and standard laparoscopic procedures

Kelly Bekeris, Nursing (Colorado Springs, CO), Sharice Jones, Nursing (Colorado Springs, CO), Noemi Miller, Nursing (Colorado Springs, CO), Taylor Engle, Nursing (Colorado Springs, CO), Josh True, Nursing (Colorado Springs, CO), Lauren Leopold, Nursing (Colorado Springs, CO), Jesslyn Liwanag, Nursing (Colorado Springs, CO)

See abstract in 2D.

4E: COPD and Telehealth

Jennifer Slane, Nursing (Colorado Springs, CO), Ryan Parnes, Nursing (Ketchum, ID), Anabi Najar Madera, Nursing (Aurora, CO), Samson Mutua, Nursing (Salt Lake City, UT), Roberto Chacon, Nursing (Pueblo, CO), Angelina Mungia, Nursing (Pueblo, CO), Michaela Sage, Nursing (Pueblo, CO)

See abstract in 2D.

4E: Put A Cap On It!

Renee E. Gribble, Nursing (Colorado Springs, CO), Heather J. Knox, Nursing (Merced, CA), Hui Jeong Kim, Nursing (Colorado

Springs, CO), *Karla M. Dunston*, Nursing (Alamosa, CO), *Kayla D. Smith*, Nursing (Lake Jackson, TX), *Danielle M. Miller*, Nursing (Littleton, CO), *Samantha A. Geisick*, Nursing (Eaton, CO)

See abstract in 2D.

4E: Shorter Shifts or Longer Weekends

Darian Horvat, Nursing (Pueblo, CO), *Ashley Richardson*, Nursing (Pueblo, CO), *Mercedes Trujillo*, Nursing (Pueblo, CO), *Bryanna Houser*, Nursing (Pueblo, CO), *McKenzie Pacheco*, Nursing (Pueblo, CO), *Brittany Guerro*, Nursing (Pueblo, CO), *Jalissa Peterson*, Nursing (Pueblo, CO)

See abstract in 2D.

4F: Identifying and Treating Hypopituitarism Secondary to TBI

Stacey G. Stancill, Adult/Gerontology Acute Care/Family Nurse Practitioner (Loveland, CO), *Heather Lollar*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Colorado Springs, CO), *Stacy Derrera*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Elizabeth, CO), *Vanessa Gallant*, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Approximately 1.7 million people sustain a traumatic brain injury (TBI) annually (United States Department of Health and Human Services [DHHS], 2012). Pressure on brain structures and hypoxia can cause damage to the pituitary gland. Hypopituitarism is an often-overlooked complication in TBI patients directly caused by pituitary gland damage. Untreated symptoms indicative of hypopituitarism can lead to decreased quality of life (QoL). The purpose of this study was to determine if adults with TBI could have improved QoL using evidence-based practice guidelines (EBPGs) for hypopituitarism-testing and treatment (HTT) soon after injury and following up within 1-year. Per a systematic review of 19 studies with over 1,000 participants, 27.5% of these patients will develop TBI-induced hypopituitarism (Waterhouse, 2012). In other words, 467,500 TBI patients may be suffering devastating effects from hypopituitarism. It is crucial to screen TBI patients for hypopituitarism per EBPGs due to the strong correlation of hormone deficiencies which can cause decreased QoL in TBI patients. (Zheng, He, & Tong 2014). We conclude that testing TBI patients for hypopituitarism according to EBPG is essential to improve QoL outcomes as it permits early detection and treatment.

4F: Ungentlemanly Heroes: The story of British clandestine operatives, and how they turned the tide of World War II

Jacob Cibulka, History (Vacaville, CA)

In June 1940 after a series of significant defeats in mainland Europe, the British army was forced to evacuate from the coastal city of Dunkirk. With their expeditionary force defeated, and much of their military equipment left abandoned in Western Europe, the British Isles were standing on the brink of defeat. One month later, the Special Operations Executive was officially born. Under strict orders from Prime Minister, Winston Churchill, to promptly 'set Europe ablaze', the SOE set to work conducting espionage, sabotage, and reconnaissance operations in occupied Europe. In July 1941 the British, adding to their clandestine arsenal, formed the Special Air Service. The SAS was formed as a direct-action group, a dagger with which to strike the Nazi military at its weakest points. With these organizations the British looked to not only hold the Nazi army at bay, but to turn the tide

of the war. I will be presenting a poster that will display both these organizations, and the significant individuals involved in them. I will also show that these organizations, and their clandestine operations did turn the tide of war. I will be obtaining information from several sources including but not limited to; non-fiction literature, biographical sources all God, and military archival information from both the British Armed Forces and the German army. This poster looks to highlight the behind-the-scenes operations of World War II, and their importance to the outcome of the war.

4F: The Disintegration of Yugoslavia: Croatia's Quest for Independence

Albert L. Marshall, History (Beulah, CO)

Following the death of Josip Broz Tito in 1980, Yugoslavia began to slowly unravel for a variety of reasons including economic difficulties, ethnic tensions, and disastrous political reforms. Varying forms of ethnic nationalism throughout the diverse region now superseded the nationally cohesive fabric that communism had previously provided. Throughout the 1980s, the rise in ethnic nationalism combined with economic difficulties faced throughout Yugoslavia led to political changes within the government. The changes saw the rise of a strong ethnic Serbian bloc take control of the Yugoslavian government. In response to the economic hardships placed on it by remaining within the Yugoslavian Federation and witnessing the dominance of Serb Nationalism within the Yugoslavian Government, Croatia declared its independence in the mid-1991. For Croatia to become a successful sovereign nation, it would have to defeat both internal and external ethnic rivalries in a bloody war for independence.

Yugoslavia, and by default Serbia, would not let Croatia go without a fight. Within Croatia's borders, a large population of ethnic Serbs did not want Croatian independence either. While not the first of the Yugoslav Wars, the Croatian War of Independence was the first major conflict in the region, and it underlined the serious ethnic tensions that came to characterize the conflicts during the Yugoslavian disintegration. The conflict in Croatia also ran concurrently with the better-known conflict in Bosnia and Herzegovina, and the two wars had direct impacts on each other.

Croatia received international recognition as a sovereign state in 1992, but fighting persisted both in Croatia and Bosnia until August 1995. Croatia's final defeat of their internal Serbian threat ironically pushed the Serbians to the bargaining table for the successful completion of the Dayton Agreement. Croatia today is a vibrant country in the Balkans that is a member of the European Union and NATO.

4F: Vision-based path planning and control of a mobile robot

D. Mike Daniel, Mechatronics (Pueblo, CO)

In this paper, we develop a vision-based trajectory planning algorithm to control a mobile robot to follow a desired path. A non-holonomic system is used to model the robot consisted of two front driving wheels and two back omnidirectional wheels. The inertial measuring unit (IMU) and wheel encoders' data is fused with visual data from a CCD camera to improve the localization accuracy. The algorithms are simulated and tested in a desktop running MATLAB and then deployed into the NVIDIA Jetson TX2 board mounted on the robot. The design of the robot is followed the theme setup by the 2018 IEEE Zone 5 Annual Conference's Robotics Competition.

4F: CBASE & Co-Create Community Collaboration Project

Shamel David, Psychology (Las Vegas, NV), *Raquel Marquez*, Biology (Pueblo, CO), *April Conchola*, Biology (Los Angeles, CA), *Hassan Abdulkareem*, Engineering (Dallas, TX), *Shion Ienaga*, Biology (Phoenix, AZ)

Colorado State University–Pueblo’s (CSUP) Communities to Build Active STEM Engagement (CBASE) Department partnered with community organization, Co-Create to provide students an experiential education opportunity in health equity, sustainability, technology integration and program development. Salvador Acuña, CSUP alumnus and Co-Create founder, provided guidance to all interns to incorporate key components of health equity and sustainability within each of the four positions: programming, financial well-being, collaborative partnerships, and shared governance. One of the guiding theoretical frameworks is Maslow’s hierarchy of needs, which ultimately illuminated Co-Create’s mission to create opportunity and success for every organization and community it serves. Each intern attempted to examine their role and duty to best provide solutions to Southern Colorado’s underrepresented communities. In order to effectively undertake the lofty objective of modernization in Southern Colorado, CBASE assembled a small team of interns. Program Development and Lead Group Intern, Shamel David was responsible for health equity research and recommendations; Database Coordination Interns, Raquel Marquez and April Canchola, were tasked with STEM funding research along with cultivating and updating a grants guide for Southern Colorado; Technology Integration Intern, Hassan Abdulkareem, researched current technology trends and tools for the future; and STEM Social Media Intern, Shion Ienaga, was responsible for researching the best social media practices for health equity accessibility for communities with limited bandwidth. In Fall 2017, the CBASE and CoCreate Community Collaboration Project began with Phase I in Avondale, Colorado. Essentially outlining significant goals and objectives, and developing integration strategies specific to Avondale, CO. In Spring 2018, Phase II consisted of implementing leadership and sustainability strategies to create a leadership institute emphasizing STEM skills. The purpose of our research presentation is to showcase how the STEM is integrated with the community, and how CSUP can partner with a community partner to provide opportunities for students and serve their local community.

4G: Octocopter Applications

Roberto Chacon, Mechatronics (CO), *Anthony Mercado*, Mechatronics

In this work, we investigate the some applications of the commercial heavy lift drone, Octocopter, which can be controlled autonomously by GPS and provide the First Person View (FPV). Potential applications include agriculture uses, such as monitoring field and precision application of pesticides or fertilizing, search and rescue, package delivery, etc.

4G: Urbanization in Renaissance Italy and the development of technology and trade networks

Garret Brooke, History, Secondary Education emphasis (Colorado Springs, CO)

For my research I would like to examine the development of urban life in Italy and how it influenced technology and economics. My question is how did the development of urban centers in Italy change

the rate of advancement in technology? There seems to be quite a bit written on this topic mainly the urbanization piece and it certainly could shed light in the modern era on how cities influence the pace of development. The sorts of sources I expect to use will likely come from other articles written on a similar topic namely technology and its rate of development in the Renaissance as well as potentially era specific articles about urbanization and its effects on technology. If primary sources are available in English I would like to use them for the research. This particular topic could certainly be useful for also ascertaining how urban centers are incredibly important for their value in generating new ideas that can spur technological progress. Another interesting thing to touch on for this is the development of trade networks with actual trade networks financed by bankers this is itself is incredibly important for technological development as the exchange of ideas as well as goods likely spurred more technological progress. Urbanization also influences the culture of various regions as a greater proportion of the population by volume is living and working in cities cultural shifts seem to occur that creates a friendly environment for inquiry into how things work which can create more technological progress. Overall I believe this particular topic will yield interesting information into the development of cities in Renaissance Italy as well as show how technology is rapidly developed.

4G: Elizabeth I: A Queen Among Queens

Shayana Dabney, Political Science (Colorado Springs, CO)

The sixteenth century seen some of the most powerful and remarkable queens in European history. Three of which to be highlighted by this research project are Catherine de Medici, Mary Stuart, and Elizabeth Tudor. The question guiding this research is: What is different about Elizabeth the First of England that allowed her to rule in her own right, whereas her contemporary counterparts, Mary Queen of Scots and Catherine de Medici, were dependent on the roles bestowed upon them by the men in their lives. Elizabeth is regarded as a high strung, but could also be extremely patient; she was intelligent, but liked to save major decisions until the last second. She both manipulated her role as a woman, and defied it. By comparing and contrasting policy of these women, the differences of how Elizabeth ruled will show how she was able to rule alone. The sources of research to be employed will be primary sources, biographies, and peer reviewed articles covering the policy and lives of these women.

4G: Lucrezia Tornabuoni, Influential Mother: How Feminism Shaped the Early Renaissance

Derek Thomas Sr., Political Science/ English (Creative Writing) (Trinidad, CO)

There has been a plethora of research into the life and times of Lorenzo de’ Medici. Much of this research has been focused on both his patronage of the arts, and his politics of the Florentine Renaissance in Italy. What this research intends to ask, and subsequently answer, is: How influential was Lucrezia Tornabuoni on her son, Lorenzo, el Magnifico, de’ Medici? Lucrezia Tornabuoni was a writer, politician, and a patron of the arts well before her son had come to be known as the “Father” of the Renaissance. She passed down to him the arts and skills that would come to shape many of the prominent minds of Europe. The study of the humanities, humanism, the push for the vernacular, and the translation of the Classics all have their roots in the Medici house of 15th century Florence. Thus, Lucrezia’s contri-

butions to the Florentine Renaissance is much heavier than previously afforded to her. This research takes up this task in a new light, with that of Feminism.

4G: Great Britain's Reign

Alexandra Kelley, English and History (Florence, CO)

My presentation will explore Great Britain's growth into a powerful nation as it is known today and how it came to be a powerful country. This will be done through exploring religion and how it developed alongside what is known today as Great Britain. Religion played an incredibly important role in developing Europe as a continent and because of that it helped to develop the way governments formed and worked. I will use this to explain that without religion helping to develop Great Britain, it would not be where it is today. This will be done in poster form for people to look over and ask questions about.

4G: Isabella I of Castile's Influence on Spanish Government as Queen

Jasmine Lopez, History (Pueblo, CO)

Isabella I of Castile was one of the leading rulers of Spain. Being known as "The Catholic" showed her loyalty to Spain and God that the job would be walked side by side upon her decisions through faith. However, the position to become Queen was difficult for her to take after her older brother Henry IV had died. The misconception of who was the deserving Queen to the throne, following the death of her brother that had declared his daughter Joan be the rightful heir to the throne. Taking the rightful position using her military knowledge and her political pull can make her superior when on the throne. Isabella I of Castile, embarks on a journey that Spain had never gone through and she pushed the limits of what she was able to succeed to fulfill. Going through crime, war, pushing territorial boundaries, and keeping the consistency of religion equal for all those that were under her. The goal is to explore how she could contain her endeavors with passion and brute force to make sure that Spain stay at its highest point of reign through Europe.

4G: Improvements in Inexpensive Metal 3D Printing Processes

Miguel A. Galaviz, Mechatronics (Pueblo, CO)

In this work, we improve the existing inexpensive metal 3D printing processes with metal clay (MC) and fused filament fabrication with metallic filament (FFF-MF). First, the metal clay 3D printing characteristics are investigated. Software and hardware solutions to a reliable 3D printing and firing (sintering) process are researched. Experiments with different printing geometries are performed and analyzed. Second, FFF-MF 3D printing characteristics are investigated. Some commercially available materials are tested under varying printing conditions.

4G: Study of Robotic End-Effectors

James Steele, Mechatronics (WA)

In this work, various robotic end-effectors (grippers) will be designed and tested with our new robots. We investigate the effect of size, number of fingers, configuration of fingers, type of the actuator (electric or pneumatic), and type of gripper (hard or soft gripper). Commercial end-effectors as well as in-house designed ones will be compared the effectiveness on handling variety of everyday objects.

5A: Linear Optimization Program of Sudoku Game

Dustin Clasby, M.S. Industrial and Systems Engineering (Pueblo, CO)

The rules of Sudoku describe a simple game, whose objective is to fill a 9x9 grid with the integers 1 through 9. The restrictions, which make the game so challenging, are that the integers cannot repeat in the same row, column, or any of the nine 3x3 sub-grids. In other words, each row should contain all of the integers 1 through 9, and so should each column and each sub-grid. The objective of this research is to develop a software program, written in Python programming language and using Gurobi Optimization software, to solve Sudoku problems.

Many approaches exist to tackle this type of problem. Linear programming offers a logical algorithm for the solution that will ensure all game rules are met. Linear programming is a form of mathematical optimization used when a constrained model is described by linear relationships.

Python is a useful and popular application programming language. It can be used for a variety of tasks, and it quite suitable for mathematical and statistical programming tasks. Gurobi is an excellent optimization software package that offers user-friendly APIs with a number of programming languages, including Python. The Gurobi code can be embedded into the Python program to send decision variables and constraints to Gurobi's optimization program, and then retrieve results.

The oral presentation of this project will describe the method chosen to develop the program. It will describe the elements of this method, including the decision variables for a game solution, as well as the constraints imposed on those variables. The actual program itself will then be described, which will demonstrate the programming tasks undertaken in this research. The faculty advisor of this project is Assistant Professor Ebisa Wollega of the Engineering Department.

5A: Picture This: Applying Visual Ethnography in an Experiential Education Environment

Samantha Patterson, English (Pueblo West, CO)

This presentation will explore the research-based methodology of visual ethnography and the important role it plays in the experiential environments in which we live and learn. Particularly, how photography, video, and web-based media function in the field of ethnography and how these forms of media are beneficial to research. I will also discuss the historical and theoretical aspects of visual ethnography, which arguably "emerged in the 1960s as an important tool for research in the domain visual anthropology" (Kharel 152). I will illustrate how visual ethnography was applied to an experiential education seminar project and share my auto-ethnographic reflections on the benefits of using visual ethnography in this project relating to communication. Finally, I will explain how this experience informs existing research on using visual ethnography in experiential settings.

5B: Noninvasive Ventilation in Amyotrophic Lateral Sclerosis

Elizabeth Jason Gillespie, Adult/Gerontology Acute Care/Family Nurse Practitioner (Englewood, CO)

Aim: To determine how the use of noninvasive ventilation (NIV) influences mortality rates at six months in adult patients with a diagnosis of amyotrophic lateral sclerosis (ALS). **Background:** ALS affects five out of 100,000 people, and approximately 6,000 people are diag-

nosed each year. There is no cure and average survival time after diagnosis is three to five years. Respiratory failure is the leading cause of death in ALS. **Theory:** Ernestine Wiedenbach's Helping Art of Clinical Nursing is comprised of four key elements; philosophy, purpose, art of nursing, and practice. Together these elements help aid the nurse practitioner to determine the best treatment available based on the patient's philosophy of care, goals of treatment, and current research. **Methods:** Utilizing the translational research method a literature review was conducted using Cochrane, CINAHL, and Google Scholar with the keywords noninvasive ventilation, amyotrophic lateral sclerosis, and increased survival time. NIH training was completed with active certification. **Results:** The American Academy of Neurology guidelines were located and a systematic review. The systematic review was comprised of two randomized controlled trials (RCTs) with a total of 54 participants. One RCT was excluded due to incomplete data. The second RCT demonstrated a 205 day increase in survival time in patients treated with NIV who had normal or modest impairment in bulbar function ($p=0.0059$). **Implications:** Patients with ALS have significantly shortened lifespans. The nurse practitioner should utilize NIV based on current practice guidelines to increase survival time in ALS patients with respiratory insufficiency.

Keywords: amyotrophic lateral sclerosis, noninvasive ventilation, increased survival time

5B: Using Azacitidine for the Treatment of Myelodysplastic Syndromes

Rebecca Penkoff, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo West, CO)

Aim: According to the National Comprehensive Cancer Network (NCCN) guidelines azacitidine is recommended for the treatment of myelodysplastic syndromes (MDS). The purpose of this study is to determine if treatment with azacitidine along with best supportive care (BSC) is more effective than BSC alone at increasing overall survival (OS) in adult MDS patients. **Background:** MDS are a group of cancers in which immature blood cells in the bone marrow do not mature or become healthy blood cells leading to anemia, neutropenia, and thrombocytopenia. The typical age of onset is 70 years old and the incidence rate is 30.2 per 100,000 people between the ages of 70 to 79. **Methods:** Translational research using a literature review design was conducted using current research evaluating the impact of azacitidine on the OS of MDS patients. By incorporating these results into Imogene King's Theory of Goal Attainment, the oncology nurse practitioner (NP) can develop evidence based treatment plans for MDS patients. The NIH module has been completed. **Results:** A significant increase in OS was found in patients that received azacitidine compared to those who received BSC alone ($p<0.001$). **Implications:** Evidence on the effectiveness of azacitidine is imperative for the oncology NP because it is a first line treatment option for most MDS patients. Based on the research review it is imperative for the NP to incorporate the recommendations of the NCCN guidelines into the treatment strategy for MDS.

Keywords: Myelodysplastic syndromes, MDS guidelines, azacitidine

5B: Alpha-1 Antitrypsin Deficiency

Natalie Zufall, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Purpose: The aim of this study is to conduct an extensive literature

review to compare the effectiveness of augmentation therapy in individuals who test positive for AATD, in comparison to not treating with augmentation therapy, in the reduction of severe exacerbations and hospitalization. **Background:** AATD is one of the three most common lethal genetic diseases that leads to severe COPD and emphysema. It is underrecognized with only 15% of individuals who have the disease being diagnosed. Despite clinical practice guidelines supporting the use of augmentation therapy and studies showing its effectiveness, it is not often used. **Conceptual Framework:** Dr. Betty Neuman's Systems Theory was used to guide research findings into APN practice. **Methods:** Translational research using a literature review design in PubMed, CINAHL, Cochrane, and Up-to-Date were reviewed. A meta-analysis, RCT, Retrospective study, and cohort study were reviewed. I have completed and am certified in the NIH training for IRB. **Results:** In a meta-analysis, it was found that with early recognition and treatment a decrease in the number and severity of exacerbations (3-5/year to 0-1/year) was found. In an RCT, augmentation therapy had a reduction in exacerbation severity and hospital admissions ($p<0.01$). Lastly, in a retrospective study evaluating augmentation therapy, hospitalization costs were reduced ($p<0.05$ and $p<0.001$). **Implications:** After a thorough review, the data showed that the clinical practice guideline is accurate in recommending augmentation therapy in treating AATD to reduce severe exacerbations and hospital costs.

Keywords: AATD, costs, exacerbation, inpatient, hospitalization

5C: Do Probiotics Decrease Antibiotic Associated Diarrhea?

Rebecca Reatherford, Adult/Gerontology Acute Care Nurse Practitioner (Valley Springs, SD)

Demonstrate how the prescribing of probiotics to hospitalized adult patients by APRNs reduces the rate of antibiotic associated diarrhea (AAD) during hospitalization in patients receiving antibiotic therapies. Antibiotic associated diarrhea is the most common side effect of antibiotic therapy. Antibiotics can cause gastrointestinal cramping, pain, discomfort, and diarrhea, which can lead to dehydration, electrolyte imbalances, and death. By applying Sister Simone Roach's Theory of using six different attributes of caring: compassion, competence, conscience, confidence, commitment, and creativity the APRN can increase patient outcomes and decrease side effects of much needed antibiotic therapies prescribed in the acute care setting. The research design used was a translational research design using a literature review. NIH certification was completed in preparation for this paper. The current literature shows that APRNs can reduce antibiotic associated diarrhea and its complications with the addition of probiotic therapy for adult patients in the acute care setting. The American Gastroenterology Association has published guidelines regarding the importance of probiotic therapy in patients receiving antibiotics. However, providers continue to prescribe antibiotics without the addition of probiotics, leading to an increase in complications, morbidity, and mortality in adult patients.

5C: Acute Otitis Media In Children

Jennifer Berrier, Adult/Gerontology Acute Care/Family Nurse Practitioner (Pueblo, CO)

Background: Acute otitis media is one of the most common childhood infections in the United States and one of which antibiotics have been prescribed for. The incidence is the highest in the first 2 years

of life. By the age of 8 years old that incidence decreases by 2%. *Aim:* There have been controversy on whether immediate antibiotic therapy is more beneficial than observation with treatment of acute otitis media and or symptoms such as pain and fever. The American Academy of Pediatrics (AAP), is a guideline that provide these types of recommendation (2013). What is the best practice? Does the child's age factor in the decision making? *Method:* transitional research using a literature review design. NIH completed.

Keywords: acute otitis media, acute otitis media treatment in children, antibiotics for acute otitis media

5C: Treatment of Pain in Pediatric Acute Otitis Media

Kindra LeDuc, Adult/Gerontology Acute Care/Family Nurse Practitioner (Castle Rock, CO)

Aim: To determine the most effective treatment for reducing pain associated with Pediatric Acute Otitis Media (AOM) by comparing the use of antibiotics vs. watchful waiting. *Background:* AOM is the most common bacterial illness treated in the pediatric population. It is estimated 80% of children will have at least one infection by age 3. *Conceptual Framework:* The use of Katharine Kolbaca's Comfort Theory guides the Advanced Practice Nurse (APN) in proper treatment through her three existing forms of comfort; relief, ease, and transcendence. *Methods:* Translational research using literature review design. Using the search terms watchful waiting, pediatric AOM treatment, practice guidelines, CINAHL, AHRQ, and The Cochrane databases were searched for information related pain reduction in treatment for pediatric AOM. A practice guideline (1) and meta analysis's (2) compiled this search. I successfully completed the NIH modules. *Results:* Evidence supports the use of Watchful Waiting according to the severity and age of the presenting patient when close follow-up is obtainable. When close follow-up cannot be confirmed, the use of antibiotics is supported in non-severe AOM cases. Pain reduction was not improved with the antibiotic as first line treatment in comparison with watchful waiting. *Implications:* Based upon the evidence collected, the APN would advocate for using antibiotics for treatment of non-severe AOM for patient safety, comfort, cost effectiveness, as well as improving overall patient outcomes.

5D: Athens' Namesake: the Connection Between the City-State's Lifestyle and Religion

Jasmine Watson, Psychology and History (Willmar, MN)

This paper will link the two fields of history and geography to explain the lives of ancient Athenians and their connection to religion. The city of Athens chose Athena as their patron goddess with significant consideration to her field of expertise and the basic lifestyle of the people of Athens based on their geographical locations and the resources they had at their disposal. This work uses primary and secondary sources to connect the geography and the location of the city-state and their way of life, which connects greatly to the domain of their goddess Athena. Research on the relationship between the ground's resources and the namesake of Athens is lacking in history. This work will attempt to integration multiple fields to give a better insight into the lives of this ancient world.

5D: Why the Soft Collapse of the Soviet Union created Modern Europe

Gerard Lee Ostrander, Political Science (Sterling, VA)

The purpose of this presentation is to show how the soft collapse of an authoritarian power leads to a vacuum, as well as a lack of safeguards to prevent its return as we have seen with Vladimir Putin's transformation of Russian politics. The presentation will show display events of the collapse and then a timeline for events in Europe that allowed for the changes to happen as they did.