PROGRAM and ABSTRACTS

3rd Annual Symposium on Graduate Research and Scholarly Projects

7th Annual Undergraduate Research and Creative Activity Forum

April 27, 2007
Eugene Hughes Metropolitan Complex

David M. Eichhorn, GRASP Chair
Larry Spurgeon, URCAF Chair
2007 GRASP Symposium

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Sriram Beldona, Associate Professor, Management (Business)
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# 3<sup>rd</sup> Annual Symposium on Graduate Research and Scholarly Projects (GRASP)

# 7<sup>th</sup> Annual Undergraduate Research and Creative Activity Forum (URCAF)

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Opening Session in Lowe Auditorium

- **8:00 – 8:30** Registration
- **8:30 – 8:45** Opening Remarks – Dean Kovar, VP Miller
  Associate Dean Eichhorn, Professor Spurgeon
- **8:45 – 9:15** Keynote Address – Dr. Francis Cooke, Director - ORI
  “Fertile Research Territory: The Interdisciplinary Gap”
- **9:15 – 9:30** Refreshments and Poster Viewing in Gymnasium
The URCAF and GRASP organizers are indebted to the following people for serving as judges in the competitions:

**URCAF**
Brien Bolin, School of Social Work  
Francis D’Souza, Chemistry  
Curt Friehs, University Libraries  
Kim McDowell, Education  
Roy Myose, Aerospace Engineering  
Paul Rillema, Chemistry  
Barbara Smith, Physical Therapy  
Larry Spurgeon, Finance  
Peter Zoller, English

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Les Anderson, Communication  
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George Bousfield, Biological Sciences  
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Kathy Downes, University Libraries  
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T.S. Ravigururajan, Mechanical Engineering  
Julie Scherz, Communication Sciences and Disorders  
Betty Smith-Campbell, Nursing  
John Watkins, Electrical and Computer Engineering
URCAF ORAL PRESENTATIONS

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Monitoring Conformational Changes in Anthrax Toxin Protective Antigen

Hang D. Pham\textsuperscript{1*}, Blythe Janowiak\textsuperscript{2}, R. John Collier\textsuperscript{2}, and James G. Bann\textsuperscript{1}

\textsuperscript{1}Department of Chemistry, Fairmount College of Liberal Arts and Sciences; \textsuperscript{2}The Department of Microbiology and Molecular Genetics, Harvard University School of Medicine

The anthrax toxin consists of an 83 kD protein called the protective antigen (PA), as well as two enzymes: lethal factor (LF), and edema factor (EF). PA binding to a cell surface receptor leads the formation of a heptameric structure called the prepore. This allows binding of LF and EF and the formation of the anthrax toxin complex, which is endocytosed and trafficked to an endosome. Within the endosome, the pH decreases to \(~5\), and a large conformational change occurs where the prepore converts to a membrane spanning pore, allowing translocation of EF and LF into the cell and subsequent cell death. In the lumen of the pore, a ring of seven phenylalanine residues from each monomer of PA at position 427(Phe427) is positioned to assist in channeling EF and LF through the pore. Site-specific incorporation of p-fluoro-phenylalanine (p-F-Phe) at F427 was used to follow the prepore to pore conversion by \textsuperscript{19}F-NMR. Interestingly, we observe a reblocking of the pore post translocation, suggesting that a conformational rearrangement occurs around Phe 427 that readjusts the Phe residues for another round of translocation. We present recent \textsuperscript{19}F-NMR data that shows the site-specific incorporation, and differences in spectra between the prepore and pore states.

The Role of Copulatory Behavior Within The Social Structure in Bachelor Groups of Captive Gorillas

Jan E. Mead-Moehring

Department of Anthropology, Fairmount College of Liberal Arts and Sciences

Modern zoological parks that house western lowland gorilla populations prefer to accommodate single-male/multi-female groups which include their sexually immature young. The result is an excess of adolescent, sub-adult, and adult bachelor male gorillas that must be housed and displayed collectively. Due to the increase of gorilla bachelor groups in the zooological community, the social structures of these all-male groups are more accessible to research. This observational study focuses on copulatory behavior within these groups and its role in the current hierarchical relationships among the group’s members. Observations were conducted at the Sedgwick County Zoo in Wichita, Kansas. The Sedgwick County Zoo has eight male gorillas in three separate groups; two groups of two silverback males, and one group of four sub-adult/adolescent males. Only the group of four was observed for this study. Observations occurred over fifteen non-consecutive days and were three hours in length. The observational method used was group-scan sampling every five minutes with all occurrence documentation of affiliative behavior within two meters or less. The social order within this group is complex and varies between dyads of individuals and the group of four. The rank of an individual was estimated by size, age, and displacement frequencies. This study suggests that sexual activity within this bachelor group may be integral to the greater social bonding dynamic.
ACIVAR Microgravity Research Experiment

Scott Christian-Dold, Peter Fast, Brian Hinson, Mallory Jennings, Alex Kanelakos*, Kevin Kelly, Bryan Steele, Erin Waggoner, Jordan Zerr

Department of Aerospace Engineering, College of Engineering

Currently, large amounts of time on the International Space Station (ISS) are spent on maintenance tasks. This may also be true for future space missions and habitats on the moon or Mars. Our project, the Aerodynamically-Controlled Intravehicular Activity Robot (ACIVAR), will demonstrate the ability to use aerodynamic forces at slow speeds for flight control in microgravity, providing the ability to monitor systems during spaceflight. The project team has designed and built a prototype containing controls, motors, and simulated sensors and cameras. The advantages of the ACIVAR are light weight, few consumables, and a simple design. Our design has been approved for flight on the NASA Microgravity Research Plane, and we will be testing a fully operational vehicle from April 29th to May 5th, 2007.

Investigation of H$_2$O and O$_2$ Addition to Gas-phase, Acetonitrile-coordinated Vanadyl-halide cations

Christopher M. Leavitt* and Michael J. Van Stipdonk

Department of Chemistry, Fairmount College of Liberal Arts and Sciences

Gas-phase ions with general composition of [VOX(acn)$_2$]$^+$ or [VOX(acn)]$^+$, where X represents F, Cl, Br or I, were generated by electrospray ionization (ESI) and their reactivity probed using multiple-stage tandem ion-trap mass spectrometry. The specific aim of this study was to determine whether the halide ligand influences the tendency to add H$_2$O or O$_2$ to the vanadyl-halide-acetonitrile complexes via gas-phase association reactions. The tendency to add a single H$_2$O molecule to the [VOX(acn)$_2$]$^+$ complexes was found to decrease following the trend F>Cl>Br>I. For the [VOX(acn)]$^+$ complexes both addition of H$_2$O and O$_2$ was observed, and the tendency to add O$_2$ followed the trend, with respect to the halide ligand, I>Br≈Cl>F.
Synthesis and Potential Applications of Cyano Substituted Hydrotrispyrazolylborato Silver Complexes

Brian Myers* and David M. Eichhorn
Department of Chemistry, Fairmount College of Liberal Arts and Sciences.

Polymeric conductors and magnets have been of increasing interest over the years. With desirable qualities like improved flexibility and overall reduced weight in comparison to most generally used metals, it is possible to understand the desire of industry to develop materials like these. Imagine more flexible circuitry using conductive polymers.

Previous research in the Eichhorn group has shown that the hydrotris(4-cyano-3-phenylpyrazolyl)borate ligand (TpPh,4CN) can form a coordination polymer in conjunction with copper. In this presentation, we report the synthesis of the analogous silver compound. The X-ray crystal structure of this compound confirms its structure, showing it to be polymeric with the nitrile group of one complex coordinating to the silver atom of a neighboring complex. This result is important because it shows the polymerization to be more general than just occurring with copper. Further research will involve an attempt to substitute another metal (e.g., indium) for the silver atom in this complex.

Applications of Optical Kerr Effect in Optical Computing

Ugo Otuonye
Department of Electrical Engineering, College of Engineering

Since the discovery of Kerr effect in 1875, scientists and engineers have explored many different applications of this effect. Kerr Effect is a change in the refractive index of a material due to the presence of a magnetic field. Of particular interest has been the development of super computing abilities using this effect. However, a major setback to the application of Optical Kerr Effect in optical computing is the negligible change in the refractive index of the material. This is usually in the order of 10 to the power of minus twenty one.

In this project, a proposal was made on how to increase the change in the refractive index of material due to Optical Kerr Effect without the use of very high intensity laser beams. This process was referred to as “continuous node summation.” Furthermore, a demonstration of possible application of Optical Kerr Effect was shown in the design of a 4 bit optical machine. This is a multipurpose 4 bit optical machine that serves as an adder, AND gate, OR gate and an inverter.
American Foreign Policy Towards China: Future Flashpoints, Economic Ties, and Motivations for Policy Makers

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By the year 2025, China will overtake the United States as the world’s largest economy. This era of rapid economic growth in China poses new threats and opportunities for the United States in the 21st century. I will argue in this paper that American foreign policy towards China is shaped by inconsistent motivations within the federal government and that this inconsistent approach to China is unique and poses a threat to future relations with the country. Potential motivations for policy makers in Washington include congressional desire to appeal to constituents as being anti-China for the sake of American jobs and exports; executive branch desires to use China as a key partner in both a globalized economy as well as the global War on Terrorism. Another key concern for the executive branch is to avoid a potential second Cold War through efforts of containment and engagement on economic and diplomatic levels. This paper will examine two areas of contention, economic relations and Chinese military modernization, as well as the implications of this inconsistent policy towards China on those two key issues.

Response to a Mood Induction Procedure As A Function of Level of Experiential Avoidance

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Non-depressed participants reporting high and low levels of experiential avoidance underwent a depressive mood induction followed by ruminative and distracting tasks. The levels of dysphoric mood did not differ between the two groups at pre-induction, and increased to an equal and significant degree following the induction procedure. As hypothesized, high avoidant participants reported experiencing significantly higher levels of subjective distress than did their low avoidant counterparts. Levels of dysphoric mood were maintained for both groups during the following ruminative phase; as expected, distress levels were maintained for the high avoidant participants, but were significantly reduced for their low avoidant counterparts. Finally, participants completed a distraction phase. Both groups showed decreases in their dysphoric mood. Overall, these findings are consistent with other research comparing high versus low avoidant participants and their responses to psychologically challenging tasks, and lend further support to the conceptualization of experiential avoidance as a general pathogenic process contributing to human suffering.
Cultural Ideologies in Sport

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The sport industry has the unique ability to directly impact societal values. Team colors, logos, and traditions are familiar to a large cross section of the American population. These symbols are commonly adopted by participants and spectators as a way of connecting and creating a sense of unity between themselves and the sport program, team, or franchise they are supporting. The use of Native American mascots, imagery, and nicknames as team unifiers has become an important topic when analyzing sport in society and is evident by the approval of a recent National Collegiate Athletic Association (NCAA) policy, which became effective February 1, 2006. The new ruling prohibits teams who use "hostile" or "abusive" nicknames and mascots from hosting any of the 88 NCAA sanctioned championship events. Because of the controversial nature of Native American imagery in sports, this study aims to examine the perceptions of students currently majoring in Sport Administration. The population used in this research (n=60), are students who will be working directly with this issue in the sport industry. As a result, surveying this population can provide useful information regarding current ideologies within the specific population, while illustrating the prospect of future change regarding Native American imagery in sports. Data were gathered using an original survey with both Likert type and open-ended questions. The results provide insight as to how future sport managers perceive the current issue. A sample of preliminary data reveals that student’s perceptions represent dominant cultural ideologies, which can counter to Native American activists and current NCAA policies.

Conceptual Psuedo-Death Within the Hour-Glass Mind

Written by Jade Hudson* Music by Nathan Kinsman

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Does the antagonist of The Hour-Glass Mind, Dr. R. Minz, prove a developmental trend in what society has come to admire among aspects of characterization? A sadistic, power-lusting, hallucination who chastises the protagonist becomes not only the most emotional character but also the most admirable facet of the movement. In overall character development I institute traits such as circular logic, religious condemnation of the weaker human mind, morbid self indulgence, and surreal self-enlightenment designed to culminate in a destructive psychological ghost of hindrance and suffering. Yet, the character’s purely psychological death evokes a deep-seated emotional response. Why does a hallucination, completely defined as an imaginary devil, constitute this response? The only possible tragedy in his purely imagined demise seems a result of his unique presence. Perhaps my experimentation with pseudo-death supports a trend in society: An overall fascination or value placed merely upon unrealistic aspects of existence.
The Predictive Power of the Big Five Personality Traits on Machiavellianism

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This study examined the relationship between Machiavellianism and the Big Five Traits of personality in a sample of undergraduate students (n = 39). The participants’ scores on Machiavellianism and the Big Five Traits were measured using 40 questions from the International Personality Item Pool (IPIP; McCrae & John, 1992) and 20 from the Mach-IV scale (Christie & Geis, 1970). Correlations between Machiavellianism and openness (-2.92), conscientiousness (-.710), extraversion (-.705), agreeableness (-.804), and neuroticism (.592) were statistically significant. However, the results of a multiple regression indicate only extraversion (p = .021), agreeableness (p < .001) and neuroticism (p = .041) were significant predictors of Machiavellianism. These findings support the hypothesis that Big Five Traits are significant predictors of Machiavellianism with neuroticism relating positively to Machiavellianism and the remaining four factors relating inversely.

Attitudes of Family Physicians Regarding the Use of Hospitalists for In-patient Care: A Pilot Study

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Introduction: Traditionally, family practice physicians have personally managed the care of their hospitalized patients. The changing healthcare marketplace, however, is stimulating changes in primary care physician practice. One change is the increased utilization of a new physician specialist known as the “hospitalist” to manage hospital in-patient care. The purpose of this study was to assess the frequency of family practitioners use of hospitalists, their level of satisfaction with the care provided by the hospitals and the degree to which increased utilization of hospitalists has affected their professional practice and their personal life. Methods: All physicians in Sedgwick County designated as family physicians were included in the study population. Results: A majority of respondents (76%) utilize hospitalists to manage the care of their hospitalized patients. Also, the majority of respondents (77%) agree that utilizing hospitalists to manage in-patient care increases their productivity and 70% reported that hospitalists improve the quality of care provided. Conclusion: Family physicians in Sedgwick County generally agree that utilizing hospitalist physicians improves their own personal productivity and also improves quality of care for their hospitalized patients.
Transverse Compressive Properties of Honeycomb Core under Oblique Loading

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The variation of transverse compressive properties of hexagonal honeycomb cores as a function of loading direction has been investigated experimentally. The energy absorption by honeycomb cores has been typically assumed to be primarily due to loading along thickness direction. However, in practice off-axis loads are present and thus the honeycomb behavior under off-axis loads must be investigated. The standard test specimens measure (2” x 2”) in length and breadth with varying thicknesses of 0.5”, 1”, 1.5” and 2” and are oriented at 0°, 15°, 30° & 45° to the loading axis. These specimens are tested using a servo hydraulic testing machine at a rate of 0.05 in/min (quasi-static). The time, load and displacements were recorded by the machine. The main information that can be deduced from the test results is the variation of compressive strength as a function of angle between the loading direction and the longitudinal (extrusion or strong) direction of the core.

The Blackboard Jungle: A Case Study of Instructor and Student Perceptions of the Learning Technology Tool Blackboard

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Each of our lives has been forever changed by the introduction of new electronic technologies that help us communicate on a global, instantaneous scale. Nowhere has that change been more felt than in education. College campuses are now wired, and more and more classes are using computers for communicating. One of the most widely used computer programs on the college campus today is Blackboard. It is an incredibly powerful tool for communication between instructors and students. But, do students and instructors view it as a helpful tool? Are they well-motivated to use it? If not, how can it be successfully used in the classroom? One would expect to find that students and instructors who perceive Blackboard as a valuable learning tool will be more likely to utilize it, and will do so in more in-depth and complex ways. This on-going case-study being conducted on the campus of Wichita State University looks at these questions through the use of instructor and student questionnaires. These are designed to gauge their perceptions of Blackboard as a vehicle for computer-mediated communication and whether such computer-mediated communication enhances student learning. Analysis of questionnaire responses focuses on these perceptions.
A Visual Exploration of Non Traditional Identity and Place

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The use of gender and sexual inequality in art has a long history. From the paintings depicting Rrose Selavys travels (Duchamp's alter drag ego) to the self-portraits of photographer Cindy Sherman as a thousand different identities, artists have long used the ideas of gender, sexual orientation and social inequality in order to make a larger statement than by words alone about their place in society. The purpose of this study is an ongoing creation of artworks that reflect the ideas of non-traditional identity and the sense of place or placelessness. The works strive to also be readable by a larger viewing audience that just those living non-traditional gender or sexual orientated lives. The artworks are created using elements of symbolism and icons that are reflective of these ideas about inequality in our society and those of my own personal belief system as a gay male. My opinions about place or "home" and identity, become visual questions about why these systems restrict peoples with a non-traditional lifestyle. To date, the research has produced approximately 10 paintings and sculptures expressing these ideas. Overall, I want a viewing audience to identify with the works on a broader level. I wish for them to leave paralleling my visual opinions with their own and to question the many social norms that exist in our modern society about the issues presented there in.

Optimization of the Location of Gates and Filling Pattern Sensors Using Genetic Algorithm in Resin Transfer Molding

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To account for the irregularities in the filling pattern during Resin Transfer Molding (RTM), adaptive control can be used to regulate the filling pattern such that the last point to fill coincides with the preset exit vent location to avoid dry spot formation. Development of spine sensors capable of continuously monitoring the flow front in realtime can facilitate the implementation of adaptive control in RTM. However, the positioning of these sensors affects the adaptive control strategy. Since the spinal sensors are placed between the injection gates and the vent, different location of the gates and the sensors could cause a non-linear trend in the dry spot formation and the filling time. In this work, Genetic Algorithm (GA) was selected as a robust search method to optimize the location of the gates and the sensors. Results obtained show that GA was able to use less than 5% of all possible arrangements to find the optimal solutions. In addition, the solutions found by GA were always in the top 0.4% of all possible combinations. These results could provide useful information for optimum arrangements and they could lead to more efficient and intelligent processing.
Comparison of Functional Fitness Training Model & the Traditional Resistance Training Model for the Development of Functional Fitness in Older Adults

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Background & Purpose: Aging is a process associated with decreases in physiological and functional capabilities. Specifically, age-related loss in muscle strength, balance and flexibility are related to impaired functional mobility in older adults. This research project was designed to compare the functional fitness ability between different types of exercise programs.

Subjects: Participants in the study included 42 men and women ranging in age from 66 to 91 years of age, who exercised on a regular basis. The participants were recruited from the Center for Physical Activity and Aging at Wichita State University. These individuals included faculty, staff and retirees of the university as well as individuals from the local community.

Methods: Participants in each group will be pre-tested and post-tested using the test battery developed by Rikli and Jones for functional fitness testing of the elderly population. Subjects participated in the functional fitness, the strength training, or control group for 12 weeks.

Results: There were no significant differences found between pretest and posttest scores among the groups for any of the functional tests. However, positive changes were noted in the functional training group.

Accuracy of Pedometer Steps & Time for Disabled Youth

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Methods: Eleven girls and seven boys with multiple developmental disabilities participated in six, eighty meter self-paced walking trials. Pedometers were placed in five locations around the waist: front right [FR], front left [FL], back right [BR], back left [BL], and middle back [MB]. Each trial was video taped, actual steps were counted, and time was verified using video recordings. Accuracy was determined by percent difference between registered steps and time on the pedometers. Percent differences were compared to actual steps and a time measured by video recordings.

Results: A high level of accuracy was found for the FR and BL locations for time, while only the FR location demonstrated adequate accuracy for steps. When one outlier with excessive weight status and slow walking speed was excluded, a high level of accuracy was observed across all locations for steps and time. Differences among locations were insignificant, with the exception of FL steps which demonstrated greater percent error scores. For the subsample, the pedometers measured time more accurately than steps.

Conclusions: Time showed higher precision when compared to steps in both the full and outlier excluded samples. Location had minimal influence on accuracy, suggesting placements of the pedometer out of view (BR, BL, MB) can be used to minimize wearer interference. Concern needs to be exercised when using this pedometer with youth that exhibit a combination of excessive weight status and slow walking speed.
Are SH-SY5Y and MN9D Cell Lines Truly Dopaminergic?

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SH-SY5Y and MN9D cell lines are commonly used dopaminergic models in studies related to neurotoxicity, oxidative stress, and neurodegenerative diseases. Early studies suggested that SH-SY5Y cells do not convert intracellular DA to NE even though DβM is present. However, our studies show that these cells do not synthesize or store substantial levels of DA or NE, however extracellular DA is taken up and converted to NE and this efficiency increases with the number of passages. Reversed-phase HPLC-EC kinetic studies show that NE is a better substrate for transmembrane transporters than DA. Thus, undifferentiated high-passage SH-SY5Y cells could be a good noradrenergic model for in vivo studies. In contrast, 12-O-tetradecanoylphorbol-13-acetate differentiated SH-SY5Y cells store substantially higher levels of DA and NE. These cells take up DA and NE more efficiently than undifferentiated cells suggesting they could be used as partial noradrenergic or dopaminergic models. MN9D cells store high levels of DA under normal growth conditions, but do not convert DA to NE. They show poor catecholamine uptake characteristics compared to undifferentiated SH-SY5Y cells, however n-butyric acid differentiated MN9D cells show efficient DA uptake kinetics similar to undifferentiated SH-SY5Y, suggesting that they could be used as a reasonable dopaminergic model.

A Study of the Application of Emerging Technology: Teacher and Student Perceptions of the Impact of One-to-One Laptop Computer Access

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The purpose of this qualitative, embedded descriptive case study was to describe and identify Sedgwick High School’s teacher and student perceptions of the impact of one-to-one laptop computer access using an appreciative inquiry theoretical research perspective and the theoretical frameworks of change and paradigm shift. Data were collected through focus groups, as well as administration of the Left-Hand Right-Hand Column Case Method. Data were analyzed using the comparative analysis matrix method. Analyzed data revealed six salient findings: (1) Students functioned in the capacity of teacher, (2) technology changed the way teachers and students communicated, (3) the culture of the classroom dynamics between teacher and student changed, (4) technology made learning enjoyable for students, (5) teachers and students believed immersion in a technology-rich learning environment created advantages for student success after high school graduation, and (6) teachers believed access to ubiquitous technology created new challenges for maintaining student engagement in the learning process. Five findings suggested technology had changed teaching and learning and helped to create a paradigm shift in the teacher and student roles. One finding revealed challenges.
Prescribers’ Rate of Compliance in Hospitalized Patients with the American Diabetes Association (ADA) Guidelines

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Background: Diabetes mellitus (DM) is a US epidemic associated with significant economic costs, reduced quality of life, and high rates of morbidity and mortality. Adherence with ADA medication prescribing guidelines can significantly improve outcomes. Hospitalization may be an opportune time to assess and increase compliance. Purpose: Determine prescribers’ rate of compliance in hospitalized patients with ADA treatment guidelines for DM management regarding: blood glucose and cholesterol, stroke prevention, ACE-I use, and pneumococcal vaccination (PPV). Methods: This retrospective, chart review evaluated all hospitalized adults, with a diagnosis code for DM, consecutively discharged from a general medical unit beginning 4/1/06 until 100 patients were evaluated. Exclusion criteria were hospital admission <3 days and death prior to discharge. Multiple measurements related to ADA compliance were collected. Results: Of the 100 patients reviewed, 96% had Type II DM; 24% had contraindications to at least one of their prescribed oral DM medications. Only 57% had HgA1c documented; of these, 56% were at goal. Only 42% had LDL cholesterol documented; of these, 76% were at goal. Appropriate stroke prevention was prescribed for 75% of patients; 69% were receiving appropriate ACE-I therapy; and 38% of eligible patients received PPV. Conclusions: A high percentage of hospitalized patients are not in full compliance with the ADA treatment guidelines.

Study of Damage distribution over the Primary Shear Zone in the Metal Cutting using Nanoindentation

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In our effort to develop metal cutting as a high strain rate test, we are interested in mapping the damage distribution over the primary shear zone (PSZ). The approach is to quantify the modulus degradation via nanoindentation and use this as a measure of damage. Specimens were prepared using a linear slide based cutting setup by stopping the machining midway through a cut. Having the specimen polished for nanoindentation, we performed tests on the workpiece and on the chip using our Hysitron Ubi1 nanoindenter with a Berkovich indenter at two different loads of 6 mN and 10 mN. The hardness and the modulus of elasticity at the location of each indent were obtained by analyzing the unloading data of the load-displacement curves based on the standard Oliver and Pharr method. It is shown that the hardness of the material increases and the modulus degrades as it shears through the PSZ. The modulus degradation is a direct result of damage occurrence during the process. The obtained experimental data will be used to obtain coefficients for models of ductile damage.
Determining Optimal Spanish Words for Inclusion in Assessments that Evaluate Children’s Phonological Patterns

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A critical need exists for unbiased speech/language assessment instruments for all children, but especially for children who speak a language other than English (e.g., Spanish). According to the National Clearinghouse for English Language Acquisition & Language Instruction Educational Programs, the number of English Language Learners (ELL) in U.S. schools has more than doubled from 2,030,451 in 1990 to 5,119,561 in 2005. Of the total ELL population, 80% are reported as being Spanish speakers. This has created a demand for Spanish speech/language services. Currently, published phonological assessment instruments in Spanish are sparse. A major issue pertains to the selection of optimal words for eliciting speech samples. Sixty stimuli were presented to 20 typically developing Spanish-speaking 3- and 4-year-old children of Mexican descent to determine which Spanish words are known best by young Spanish-speaking children. The results indicate that body parts and food/drink items were identified most readily by participants. Colors and numbers were named first in English more often than in Spanish. This analysis will provide additional data regarding differences found from a previous study involving children’s abilities to recognize pictures of words and objects in Spanish. Results will be used for the selection of optimal words for future Spanish phonological assessment protocols.

No Child Left Behind?: The Academic Achievement Gap Between Blacks and Whites

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The issue of racial inequality in education has consistently been addressed through government policy in an attempt to solve the problem of discrimination rampant in the American school system. The latest government stab at establishing equal education in America is the No Child Left Behind Act of 2001. This study examines the relationship between race and composite reading and math test scores with secondary data analysis from the Educational Longitudinal Study of 2002 with a topical alternative model consisting of four segments: student role performance measured with variables such as sex, race, and disabilities; schools measured with variables such as student/teacher ratio and number of school rules; families measured with variables such as family structure and socioeconomic status; and peers measured with variables such as peer influence and number of peer dropouts. Univariate, bivariate, and multivariate analyses are used to examine the independent effects on test scores. Mean composite test scores show an 82.8% gap in test scores between black (44.42) and white (53.64) 10th grade students. The examination of each model segment and path analysis shows student role performance factors and school factors explain more of the variance on test scores and have more of an effect on test scores than other model segments. This suggests that racial discrimination within the school setting contributes to the academic achievement gap between blacks and whites.
A Retrospective Chart Review Comparing Adalimumab, Infliximab, and Etanercept in Patients with Rheumatoid Arthritis

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Introduction: Rheumatoid Arthritis (RA) is an autoimmune disease that causes chronic inflammation of the joints and can be extremely debilitating. A newer class of drugs called tumor necrosis factor inhibitors (TNF-Is) have been proven effective in reducing joint destruction and overall disease severity. However, it is not known which of these TNF-Is is most efficacious. Methods: This study compares three TNF-Is: Adalimumab, Infliximab, and Etanercept through retrospective chart review completed at Arthritis and Rheumatology Clinics of Kansas in Wichita, Kansas. The study analyzed the pain score, fatigue score, and Health Assessment Questionnaire (HAQ) score for approximately 100 women between the ages 35-65 with active RA who were taking one of the three medications mentioned above. Results: The sample of 100 were screened for those subjects who scores prior to administration of drug and 1 year data was available. The final sample sizes by drug were Adalimumab n= 11, Infliximab n= 26, and Entanercept n= 8. ANOVA showed significant differences for pain (p<0.000), and fatigue (p<0.023), but not differences between groups in HAQ scores (p<0.191). Conclusion: Although no conclusions could be made regarding Etanercept, the results indicate that Infliximab is better at reducing pain and fatigue associated with RA than Adalimumab.

Dispersion Effects on High Speed Tension Testing - SHPB

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Characterizing the behavior of composites under dynamic loading is not an easy task. The majority of dynamic testing techniques introduce complex stress fields preventing a fundamental formulation of strain-rate effects on material properties. The Split Hopkinson Pressure Bar (SHPB) provides with a uniaxial homogeneous state of stress. On compression testing the specimen is sandwiched between two pressure bars. It sits flat against each bar requiring no fixing or gripping. In contrast, tensile testing requires mechanical interfaces between specimen, fixture, and bars that hinder the stress wave transmission introducing dispersion into the recorded signals. Reducing mechanical joints between bars and testing coupon is a must. The tensile SHPB apparatus and load path are simplified for testing reliability. In the proposed gripping mechanism, specimen is bonded to a cap, which is threaded to the bars end. Specimen geometry was designed for a smooth load transmission minimizing stress concentration. A parametric study for individual components effect is carried out. Thread length and series, specimen holder size, and bondline thickness are evaluated while testing on elastic regime. The dispersion correction procedure is based on numerical results of the first mode of vibration of Pochhammer-Chree elastic wave equations using Nyquist frequency in data analysis as the cut-off frequency. The amount of dispersion is quantified. Influential parameters are identified. A dispersion correction technique is developed to reduce the magnitude of the oscillations of the stress-strain plot.
A Retrospective Evaluation of Potentially Inappropriate Medication Use in Hospitalized Elderly Patients

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**Background:** An estimated 30% of hospitalizations in the elderly may be drug-related. The Beers criteria are a list of potentially inappropriate medications (PIMs) generally considered unsafe in the elderly. These criteria are useful assessing quality and safety of prescribing in the elderly population. **Purpose:** Evaluate PIM use, defined by the criteria, in elderly hospitalized patients. **Methods:** This cross-sectional study evaluated hospitalized patients ≥ 65 years old, consecutively admitted to general medical floors, starting 4/1/06 until 100 patients were enrolled. Each patient’s home, discharge, and inpatient medication profiles were screened for PIMs. Actual usage and duration of therapy, source of prescription, potential justification for use, and pharmacy interventions were also collected. **Results:** Based on home medication lists, 32% of patients were taking ≥ 1 PIM prior to admission; rising to 56% during hospitalization; and declining to 36% at discharge. Of the 93 active hospital PIM orders, 62% were new orders and 38% were continued from home; 85% were categorized as “high” risk; 8.6% were potentially justified; and pharmacists intervened on 3 of the PIM orders. **Conclusion:** The percentage of patients prescribed PIMs increased significantly during hospitalization, but returned to baseline at dismissal. Health care provider education regarding safe medication prescribing in elderly hospitalized patients, formulary changes, and alterations to preprinted orders may be needed.

Generation of a Protein-based Fluorescent Reactive Oxygen Species Sensor

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Reactive oxygen species such as -O₂⁻ and -OH⁻ can cause oxidative damage to various biological molecules. The aim of this research is to test the hypothesis that the biosynthetic incorporation of [2,5-H₂]phenylalanine into proteins will facilitate the detection of radical oxygen species via the free radical oxidation of [2,5-H₂]phenylalanine to phenylalanine. This hypothesis was tested through the biosynthetic incorporation of [2,5-H₂]phenylalanine in to (Tyr66Phe) of the green fluorescent protein(GFP). Tyr66 is an essential component for the formation of the chromophore of GFP and mutation of Tyr66Phe will result in a blue shift in the fluorescence. However when [2,5-H₂]phenylalanine is incorporated to this mutant GFP will become non fluorescent and only in the presence of superoxide will the conversion to Phe will occur and will become fluorescent again. Mutagenesis of Tyr66Phe was carried out using the Quickchange mutagenesis kit from Stratagen. The Phe-auxotrophic E.coli strain(NK6024) harboring pGlo(gfpuv) Tyr66Phe were used to label with [2,5-H₂]phenylalanine. UV absorbance and fluorescence spectra were recorded on WT, Tyr66Phe and [2,5-H₂]phenylalanine labeled protein. The proteins were then reacted with superoxide radicals. It was observed that [2,5-H₂]phenylalanine labeled protein goes from a non fluorescent to a fluorescent state whereas The WT and the Tyr66Phe protein has no significant difference in the fluorescence in the presence and absence of superoxide. This indicates that Green Fluorescent Protein can be used to develop a reactive oxygen species sensor.
Genetic Algorithm to Solve a Multi-Objective Scheduling Problem

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Energy is expensive and a potential way to reduce energy consumption may be through using intelligent scheduling techniques. In this paper, we propose a genetic algorithm to solve a single machine scheduling problem where the objectives are minimizing total completion time and energy consumption of manufacturing equipment when all of the processing time and release dates of the job are known. This problem has several application including scheduling in manufacturing industry, energy minimization in computers, cell phones, sensors, etc. Different fitness functions and parameters depending on the problem's characteristics were tested using a design of experiment approach. The proposed methodology generates several pareto optimal solutions. A decision maker can select one of these solutions using Analytical Hierarchical Process.

Media Violence, Negativity, and The Cultivation Theory

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Violence in the media, and how it affects individuals who view it, has become a widely debated topic in the past decade. Television violence has steadily increased and lately has exploded. This research examines two questions: Are the negative perceptions people perceive about their world related to the types of programs they view on television, and are these perceptions of the world more negative depending on the amount of time watched? This study examines the negative perceptions individuals have and the relationship between their perceptions and the television programs they view and is based on the theoretical perspective of George Gerbner’s Cultivation Theory. This research provides limited support for Gerbner’s theory. There is a positive correlation between some negative perceptions of society and the violent television programs people watch, while there is no correlation between others. One hundred and seventy four students from five lower and mid-level undergraduate communication studies classes at a medium-sized Midwestern University participated. Surveys were randomly administered in the undergraduate classes. Open-ended questions were used to determine the most prevalent fears amongst undergraduates. The survey also explores if these fears are tainted by the amount of hours of television viewing and examines the media behaviors of selected individuals.
Ethical Training in Allied Health Professional Education: 
Current Pedagogical Approaches to Ethical Training

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**Background:** Ethics education has been a concern of medical, nursing and allied health professions education for decades. There is growing evidence that the current informal curriculum of ethics and the moral environment of the professional practice are not enough for the healthcare students’ professional and moral development. **Objectives:** The aim of this study was to survey allied health schools and colleges about their present and planned approaches to providing healthcare ethics training. **Methods:** A web-based survey using mrInterview was made available to 106 Institutional members of Association of Schools of Allied Health Professions. The survey was a cross-sectional, evaluative study developed and administered during the period of January 2006 and September 2006. **Results:** The response rate was 41%. Most institutions (95%) include some type of ethics education as part of Health Professions education with 73% offering a formal ethics course. 72% of respondents believed the training offered was adequate. Of note, 46% of respondents replied that they didn’t know if the training offered was effective yet only 16 % report they are considering changes in their ethics education program. **Conclusion:** This survey provided a sampling catalog of current curricular assessment approaches used in a subset of AHP schools. Data suggest that the longstanding concern about the nature and format of ethics education in health care education remains a significant issue.

Mechanism of Ovarian Disruption by Neonatal DES Exposure:
A Further Investigation into Ovarian Function in the Hamster Cheek Pouch.

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The proposed project is a continued effort to investigate whether neonatal exposure to the synthetic estrogen diethylstilbestrol (DES) disrupts the morphogenesis and function of the hamster ovary by a direct or indirect mechanism. To test this hypothesis we exposed neonates directly to DES and assessed subsequent consequences in the ovarian cells/tissue. The estrus cycle was monitored and circulating sex steroid and gonadotrophin levels were measured to determine if any DES-induced alterations of hypothalamus/pituitary were correlated with ovarian dysfunction. The hamster cheek pouch was exploited as an ectopic site for used cross-transplantations of ovarian tissue between control and neonatally DES-treated donor and host animals. While the histological assessments of these cross-transplants were inconclusive, we did find evidence that there is a possible indirect effect of DES on the ovary based on our observations of the host's reproductive cycle. Immunohistochemical analyses detected the expression of the steroidogenic enzyme aromatase within the implants of all treatment groups providing evidence of ovarian steroidogenic activity. The latter finding was corroborated by evidence of estrogenic stimulation of host uteri in all the host treatment groups.
“Hitch your wagon to a star:” The Kansas Boom of 1887.

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Kansas experienced a major boom in the late 1880s that touched nearly every aspect of life in the state. Wichita, for instance, was the fastest growing city in the nation barring none. Other Kansas towns across the state entertained grandiose notions of growth including industrial developments and agricultural bounty beyond compare. By late 1888 and early 1889, the boom had largely collapsed, setting the stage for the growth of Populism and other economic reforms.

Studying the rhetoric of boomers primarily through newspapers, memoirs and other written accounts, this study has focused on the boom as it was experienced in central and south-central Kansas during the late months of 1887, when it became apparent that the boom could not go on forever.

Quantitative and qualitative analysis of boom institutions and boomer rhetoric have been combined in the paper to produce a picture of booming communities in the central part of the state. Much boomer rhetoric contained a sort of fervor in much the same vein that was exhibited during the Kansas Free State movement.

By the end of the boom many were left with a feeling that approximated, as Rea Woodman of Wichita put it, “a giant hangover.” The end of the boom also brought on the Populist movement particularly in Kansas, which later became a national political force.

Effects of Attending Phase II Cardiac Rehabilitation on Patient vs. Partner (Proxy) Quality of Life Perceptions

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A cardiac event requires continuous adjustment by both patient and partner as they cope with the acute event and later lifestyle changes. Little has been published about patient and partner views of the patient’s health related quality of life (HRQL) related to cardiac rehabilitation (CR) participation. The purpose of this study was to describe patient versus partner ratings of the patient’s HRQL before and after 6 weeks of Phase II CR. Roy’s Adaptation Model framed the study. A non-probability sample of patients referred to phase II cardiac rehabilitation and their partners were recruited. The study enrolled 54 patient/partner pairs. The patient and partner perception of the patient’s HRQL was measured using the Short Form-36 v2™ (SF-36) instrument. Differences in HRQL ratings between two groups were evaluated at entry to Phase II CR (T1) and after the patient completed 6 weeks of Phase II CR (T2). Differences between the group means were tested with a student’s t-test, (p < 0.05). Preliminary results indicate statistically significant difference between patient and partner views of the patient’s HRQL in vitality (p < 0.001) both at T1 and at T2, in mental health (p < 0.001) at T1, and in the mental component summary (p < 0.05) at T1. Partner views of the patient, often neglected, may increase understanding of factors affecting the patient’s recovery after a cardiac event as well as guiding development of interventions to ease the stress of both patient and partner during recovery.
Effects of cam boot on plantar pressures during gait

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During walking, plantar pressure is exerted through the foot from the time when the heel is in contact with the ground until the toes leave the ground. A cam boot is designed to spread this pressure across the entire plantar surface of the foot and is typically worn by one with a foot or ankle fracture. In an average person, a slight leg length difference (LLD) is normal; however wearing a cam boot increases this LLD one-half of an inch. This LLD caused by wearing the cam boot may result in a difference of plantar pressure between feet. Significant increases in pressure may lead to ankle, knee, hip, and low back pain. Presently, physical therapists do not even out the LLD by building up the unaffected foot when prescribing a patient with a cam boot. The purpose of our study is to test possible significant variations in plantar pressure between feet from LLD caused by wearing a cam boot. The results of our findings could lead to new evidence suggesting that equalizing the LLD caused by wearing a cam boot will also equalize plantar pressure between feet, resulting in a decreased chance of pain from body malalignment. Twenty-five female and nine male subjects between the ages of 18-45, who met the inclusion criteria, performed two walking trials: once wearing and once not wearing a cam boot. Plantar pressures were measured using the F-scan computerized insole system. From our results, we hope to show that there is a significant difference between plantar pressures while walking with and without a cam boot.

The Impact of Educational Technology on Learner Interactions

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The purpose of this research was to study a selection of elementary school classrooms in order to observe, analyze, and describe the impact of educational technology on learner interactions. As a qualitative research project, the methods employed included observations, personal interviews of teachers, focus group interviews of students, and document review. Findings from three descriptive case studies indicated that educational technology, when incorporated into traditional teaching practice, resulted in little change in learner interactions but a discernable increase in student interest and motivation. When integrated into lessons that were more constructivist in nature, technology was observed to facilitate higher levels of communication and collaboration between students and teachers. Particularly of interest was a “students as teachers” model that occurred as students shared their knowledge with others, often coupled with teachers allowing students to have more control of the learning process. The study concluded that integrating technology can positively impact the interactions of learners in elementary classrooms when used as a tool to support constructivist pedagogy. The conclusions also definitively speak to the powerful role of the individual teacher and how their daily instructional decisions are impacted by their personal philosophies, background, pedagogical preferences, and comfort with the technological tools at their disposal.
Duplex Rates for a Multiantenna Gaussian Broadcast Channel with Limited Feedback

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The use of limited feedback of channel state information in multiple-input multiple-output (MIMO) wireless communications has grown in interest over the last few years. Research has shown that feedback can be used to increase achievable data rates and add resilience against fading. However, it is only recently that the overall impact of feedback on system capacity has been examined. Models that do not consider feedback overhead are valid in conventional wireless systems with ever present control channels such as GSM, but they fail to highlight the hidden aspect of data rate loss due to feedback when control channels are not present in general. In this paper, we extend a new system model, called a duplex model that was introduced for a single-user system, to one for a multiple user scenario as seen in cellular communications. A new distortion function based on prior results for the Gaussian vector broadcast channel and Lloyd’s algorithm-based codebook design is subsequently presented. This system model is used to derive bounds on the amount of feedback needed under different antenna, signal-to-noise ratio, and bandwidth assumptions. Simulation results show the necessity of taking feedback into account for multi-antenna wireless systems with multiple users.

A Study of Tanning Operators in the State of Kansas: Their Attitudes and Stated Practices on Minors and Tanning

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Introduction: It is estimated that 30 million Americans will tan this year and about 2 million of them will be teens. Exposure to UV rays seems to be the most important environmental factor in developing skin cancer. About twenty-three states have passed some type of legislation on youth access to tanning. Kansas has no regulations on youth access to tanning. Few studies have been done regarding whether tanning operators support or oppose youth access restrictions. Methodology: The purpose of this study was to evaluate the basic demographics, attitudes and stated practices regarding youth access to tanning among Kansas tanning operators. A survey was mailed to Kansas tanning facilities regarding these questions and results were analyzed using descriptive statistics. Results: The survey response rate was 28% (n=651). The majority of the respondents felt that there were “none to a little risk” with indoor tanning (60%). Most felt that someone could be too young to tan yet only 65% had ever discouraged one from tanning because of their age. Ninety-two percent of tanning operators supported written parental consent for youth tanning. Conclusion: The majority of operators believed that written parental consent and age regulations for indoor tanning should be required, yet they were not enforcing such consent. This is the first Kansas study documenting perceptions of tanning operators regarding youth access to tanning and stated practices.
The Social Control of Prostitution: Qualitative Reflections on the Police

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The social control of prostitution has resulted in enormous expenditures of police time and resources in many communities across the United States. Police strategies such as aggressive hot spot patrols and sting operations resulting in multiple arrests of prostitutes are commonly used by social control agencies. It is questionable whether strategies such as these are effective in resolving prostitution both in the long and short term. Furthermore, there is a dearth of literature that assesses the perceptions of police officers themselves toward the social control of prostitution. This qualitative case study aims to explore the perceptions of police officers toward prostitution using interviews as the data collection strategy. The study was guided by three main questions: (1) What are police officers perceptions in regards to expending time and resources toward the enforcement of prostitution laws? (2) What are the perceptions of police officers regarding whether prostitution should be decriminalized and regulated? and (3) What are the perceptions of police officers regarding whether or not prostitution results in social harms? The study uses a modified analytical and mechanical reduction strategy similar to that used by Corbin and Strauss (1990) in their grounded theory work.

Application of a Unified Procedure for Continuous-Time and Discrete-time Compensator Design for DC Motor Control

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In control systems education today, there is a gap between the theory taught in the typical undergraduate classroom and what students are able to apply to practical systems. In last year’s GRASP, we presented a simple unified design approach, which was independent of the nominal system information, for most standard continuous-time and discrete-time classical compensators. This unified approach is based on a standard root locus design procedure for a proportional-derivative (PD) compensator. In this paper, we demonstrate how easily the procedures can be applied to real life system. In particular, we show how they can be used to design continuous-time and discrete-time lead compensators for shaft position control of a DC motor. In this application, we have used the delta operator to design lead compensators from the continuous-time and discrete time frequency responses. Both the continuous-time and discrete-time compensators are shown to meet the design specifications.
Conversion of Fatty Acids to Amides to identify by ESI-MS

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Fatty acids are important biological molecules. That are essential to the human body. In this study, a new method for fatty acid analysis by mass spectrometry was developed. Fatty acid-amide derivatives were formed using PS-Carbodiimide resin in dichloromethane. Samples were prepared in with 1 molar equivalent of 3,5-methyl pyrazole, 1.5 molar equivalents of the fatty acid and 2 molar equivalents of the resin with approximately 10mL of dichloromethane. The samples were stirred for at least 12 hours, then vacuum filtered. The dichloromethane was evaporated off using argon gas, and the remaining fatty acid-amide derivatives were dissolved in 10% methanol in dichloromethane. Mass spectra were collected using a Varian 1200L Quadrupole Mass Spectrometer with helium as the bath gas and nitrogen as the carrier gas. The advantage of these fatty acid-amide derivatives is the ability to be seen using positive polarity which grants a 10 fold increase in sensitivity over negative polarity. Also, the 3,5-methyl pyrazole is UV active this allows the fatty acid-amide derivatives to be seen using UV detectors. The fatty acid-amide derivation was shown to be successful on multiple fatty acids. A technique for quantification of these fatty acids is still in progress. With the differing lengths of the hydrocarbon chains and an UV active pyrazole ring attached, these fatty acids should be suitable for reverse-phase high performance liquid chromatography. A liquid chromatography method is currently being developed.

Influence of 4-Aminomethylbenzoic Acid on Competitive Fragmentation Pathways During Cid of Metal Cationized Peptides

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Formation of \([b_n+17+\text{cat}]^+\) is a prominent, if not dominant, collision-induced dissociation pathway for \(\text{Li}^+\) and \(\text{Na}^+\) cationized peptides. Dissociation of protonated and \(\text{Ag}^+\) cationized peptides instead favors formation of the rival \(b_n^+/[b_{n-1}+\text{cat}]^+\) species. In this study the influence of a 4-aminomethylbenzoic acid (4AMBz) residue on the relative intensities of \([b_3+17+\text{cat}]^+\) and \([b_3+17+\text{cat}]^+\) fragment ions was investigated using tetrapeptides of the general formula \(A(4\text{AMBz})AX\) and \(A(4\text{AMBz})GX\) (where \(X = G, A, V\)). For \(\text{Li}^+\) and \(\text{Na}^+\) cationized versions of the peptides there was a significant increase in the intensity of \([b_3+17+\text{cat}]^+\) for the peptides that contain the 4AMBz residue, and in some cases the complete elimination of the \([b_3+17+\text{cat}]^+\) pathway. The influence of the 4AMBz residue is attributed to generation of a highly-conjugated oxazolinone species as \([b_3+1+\text{cat}]^+\), which increases the stability of this product relative to the rival \([b_3+17+\text{cat}]^+\) ion. This conclusion is supported by dissociation profiles, which show that the rise in \([b_3+1+\text{cat}]^+\) or \(b_3^+\) product ion intensities shifts to significantly lower applied collision voltages when the 4AMBz residue is positioned such that it should enhance formation of the conjugated oxazolinone.
The Use of Data-Organization Strategy to Improve Covariation Detection

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Covariation detection, or judgments of the relationship between two variables, has been studied extensively in psychology. Research has demonstrated that people are unable to accurately judge correlational relationships (Arkes & Harkness, 1983; Jenkins & Ward, 1965; Smedlund, 1963; Ward & Jenkins, 1965). This study was designed to improve covariation detection by utilizing a data-organization strategy. Participants were presented with information about a fictitious homeopathic medicine, Flu-EZ. Their task was to evaluate the relationship between the use of Flu-EZ and the disappearance of flu symptoms. Participants evaluated 52 cases in which a person either took Flu-EZ or did not and either recovered within 48 hours or did not. All participants were provided with a table to record information from the cases. Participants were randomly assigned to one of two conditions. In condition 1, participants were only instructed to record the cases in which Flu-EZ was used and the flu was gone in 48 hours or Flu-EZ was not used and the flu was not gone in 48 hours. In condition 2, participants were instructed to record all of the cases. After the presentation of all 52 cases, participants were asked to rate the effectiveness of Flu-EZ. Data collection for this study is still in progress. Upon completion of the study, the two conditions will be compared on their effectiveness judgments. The anticipated difference is that participants in condition 1 will be more accurate in their judgments of the relationship between Flu-EZ and the disappearance of symptoms compared with condition 2.

Bonding of Gas-Phase Metal-Thymine and Metal-Uracil Complexes Using Electrospray Mass Spectrometry and Density-Functional Theory Calculations

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The stability of non-covalent bonds in metal-thymine and metal-uracil complexes is of great interest because of the medical implications that it entails, as the binding of metal to pyrimidine bases can have negative effects upon a DNA helical structure. While research studies have been conducted on the binding of coupled nucleotide bases to various metals, few studies have focused on individual nucleotide bases forming complexes with metals. Using density-functional theory calculations of the non-covalent bonding in thymine-metal and uracil-metal complexes, K+, Na+, Rb+, Cs+, and Li+ were all added individually to an equal concentration of thymine or uracil and each complex was analyzed using an electrospray mass spectrometer. To better understand the stability of the complexes, energy was added to the samples in the mass spectrometer and the resulting peaks were studied to determine the stability of all the compounds formed. The results indicated that an optimal number of thymine or uracil molecules binds to a metal depending on the size of the metal. For instance, cesium favorably binds five thymine, while sodium will only bind four. As energy is added to the system, thymine or uracil molecules are thrown off of the metal and the hydrogen bonding between the remaining nucleotide bases can dictate the configuration of an umbrella shape from a planar conformation.
Impact of Math Instruction on Student Acquisition of Skills

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This study examined elementary students’ acquisition of math skills following an instructional unit on fractions and to examine the potential impact language proficiency had on learning. The unit consisted of direct instruction in fractions as well as application and synthesis activities. Twenty-four third grade students from a local elementary school participated. Students completed pre- and post-assessments related to fractions as well as an instructional unit that spanned five school days and incorporated a variety of instructional approaches. Results from the Shapiro-Wilk test of normality indicated that data did not violate assumptions of normality; therefore, parametric statistics were employed. To determine if students’ growth in fraction knowledge and application was statistically significant, an independent sample t-test was conducted. Statistical testing revealed significant differences, $t(18) = 27.32, p = .000$ with post-assessment scores ($M=12$) being higher than pre-assessment scores ($M=9.16$). To determine if growth was impacted by language proficiency (ESOL vs. NonESOL), a one-way analysis of variance (ANOVA) was conducted. Results indicate that ESOL students’ performance on the pre-assessment did not differ significantly from NonESOL students’, $F(1, 17) = 1.32, p = .27$. Results also indicated that there were no statistically significant differences in performance on the post-assessment based on language proficiency, $F(1, 17) = .070, p = .794$. It was concluded that teacher candidates can have a positive impact on student learning and that language status may not play as critical a role in math as it does in more reading-related content areas. Finally, while language status was not a factor in the growth from pre- to post-assessment, this unit incorporated several instructional strategies aimed specifically at the needs of ESOL students.

Iron Rich Clay Bodies in a Recycled Electric Kiln

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Clay bodies can be formulated using commonly available processed clays for a wide variety of specific functions. Some of the functions I am interested in include the temperature ranges that clay can be fired to and the atmosphere of the kiln that promotes color variation, for aesthetic purposes. Like Bone-China that was developed in Europe as an attempt to mimic the Chinese translucent porcelain, I intend to use my research to provide an alternative to glazing work by using the bare clay body for color and vitrification.

Developments in pyrometers, measuring kiln temperatures, and oxygen probes that can measure the relative atmosphere in a kiln, has improved the quality of this research. These tools have allowed ceramic artists to critically analyze the chemical processes that affect iron in clay which leads to coloration of the clay after the firing.

I intend to research eleven combinations of reduction and oxidation firing methods on thirty separately formulated, high iron, clay bodies. I will be looking for specific color variations that happen when reduction atmospheres are achieved in relation to the temperature of the kiln. One firing will be in an electric kiln and will be used as the control, or pure oxygen atmosphere. Ten firings will be done in a gas test kiln made of recycled ceramic electric kilns. Firings will be graphed with information including time, temperature and atmosphere. The test clays will be made into bowls and displayed in conjunction with the statistical data from the research.
Strategy and Movement

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Shaping your future comes from foresight, planning and the correct sequences of physical moves. These elements of thought are present in the classic cerebral games of Chess, Othello and Pente. I have great respect for these games because they allow one to express pre-conceived ideas and choreographed plans with the smallest of physical moves.

My studio research will involve combining the photographic process of Cyanotyping onto the three-dimensional surfaces of ceramic sculpture. These aesthetic forms will be interpretations of classic cerebral game pieces. Cyanotyping is also known as the process of blue printing, which utilizes Green Ferric Ammonium Citrate and Potassium Ferricyanide. When these two chemicals are mixed together in equal parts, the final solution that is formed is sensitive to ultra violet light.

My final project will entail making a series of five ceramic sculptural objects that will be utilizing the Cyanotype process in a new way to further develop the visual elements of line, tone and pattern on the surfaces of the pieces. I will be appropriating the forms of classical game pieces and will be exploring sculptural elements of form, size and shape that will reflect the oppositional relationships that are present in cerebral games of strategy.

Examining the First Women Potters in America and their Influence on Contemporary Ceramic Art

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The goal of this research is to demonstrate artistic lineage and the intertwined history of early American women potters. This history shows how a technical process, pot or teacher has affected and created a lineage of artists and how they have continued to develop throughout the decades of the twentieth and into the twenty-first century.

During the early 1900’s women in America were becoming artists, teachers and business owners. The roles of these women potters have been noted individually in biographies and historical overviews but many of their professional relationships overlapped and their particular achievements continued through students or associates. The method of this research involves historical research much like a family tree of professional and artistic developments. In this case the research starts with the individual and continues forward show the propagation of development to the present. It is the combine history of these women that show the depth of their impact on American pottery in the twentieth century and the interrelationships between these women who taught and influenced each other and new generations of ceramic artists.

This research will show detailed graphs and pictorial representations of the first women potters including their achievements and interrelationships. The presentation will demonstrate artistic lineage and the diverse achievements that influence contemporary ceramics.
Adult Preferences Between Two Symbol Sets: Comparing Boardmaker® and Overboard®

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The purpose of this study was to determine the preferences of typical individuals for two symbol sets (Boardmaker® or Overboard®). These symbol sets can be used on communication devices for persons who cannot speak. Limited data exist regarding user preference for symbol sets, therefore symbols are typically chosen based on accessibility or clinician preference. A total of 56 participants in four age groups completed the study, consisting of three tasks. A set of 25 words was represented by both Boardmaker® and Overboard® symbol sets. Participants were asked to learn the symbol names, complete a forced choice preference, and provide qualitative information about symbol preference. Each age group showed no clear preference for one symbol set over the other, although the 51-65 age group required a slightly greater number of trials to learn the Overboard symbols®. There was a significant difference in the oldest age group ($p<0.05$) with respect to acceptability of the Boardmaker® symbols over the Overboard® symbols for use on a communication board, if they might ever need to use one. While neither symbol set was highly preferred over the other, it does not mean that one symbol type should be chosen routinely over the other on the basis of clinician preference or accessibility. Client and family choices should be carefully considered when selecting symbol sets for a client’s use.

Communication Opportunities Provided to Children with Special Needs: Preliminary Data

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This study was done to obtain preliminary data about the number of communication opportunities provided by classroom teachers to children (aged 2 ½ to 3 ½) with special needs, and the children’s responses to those opportunities. The study, conducted at the Rainbows United, Inc. in Wichita, involved observing teacher/student interactions in five toddler classrooms serving children with developmental disabilities as well as typical peers. The observation procedure used in the study was adapted from the work of Sigafoos, et al. (1994). Teacher/child interactions were observed in 10 second blocks, for a total of 24 minutes per session. Two observation sessions were done in each classroom. Results indicated that a communication opportunity for the children was provided in fewer than 30% of the observed blocks. Additionally, the children did not respond to a communication opportunity when provided by the teachers in 42% of the observed blocks. The possible explanations for the lack of communication opportunities provided by the teachers are low expectations of the children and teaching models that do not always accommodate for children with special needs. Children with developmental disabilities frequently did not have an appropriate means with which to respond, or were not provided sufficient time in which to respond.
A Study of Patient and/or Family Use of Alternative Sources of Healthcare Information

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Healthcare consumers have access to a multitude of health related resources. The internet and other sources of healthcare information are prevalent but, little is known about patients or families’ use of these alternative sources of information. The purpose of this pilot study is to explore whether local healthcare consumers are seeking and/or using more alternative sources of health information related to their personal health care issues. Self report information will be collected via a written questionnaire from a convenience sampling of patients and or family members at local healthcare facilities. Study subjects will consist of patients and or family members age 18 years or older who have consented to completing the written questionnaire. Descriptive and comparative statistics will be used to analyze the data.

Nurses’ Perceptions of Evidence-Based Practice

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Evidence-based practice (EBP) has emerged as a marker for health care quality. However, several barriers prevent the transition of nursing research to practice, such as lack of knowledge, lack of time, and little perceived value. The purpose of this descriptive study was to examine the extent of current understanding of EBP, research skills, and attitudes among registered nurses in an urban Midwestern hospital. A convenience sample of 422 (40.9%) nurses returned the Clinical Effectiveness and EBP Questionnaire. Results indicated that nurses generally had a positive attitude towards EBP. Although only 44.7% indicated that they read research journals, significant differences were found between those who read research journals and EBP process, skills, and attitude. Other inconsistencies were also found. Those with ADN had higher mean scores in EBP process than those with a diploma or BSN, but had the lowest mean scores in attitude. Those aged 31-50 reported higher scores EBP process, skills, and attitudes, while those younger than 30 and older than 51 had lower means on all three measures. These results indicate that there may be an organizational misunderstanding of EBP. It is, however, possible that the nurses’ higher perceptions of EBP will influence success of implementation. EBP educational programs, therefore, may be met with greater overall consent and improved application.
Differences in Health Related Physical Activity and Fitness of Elementary School Children

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Research supports a correlation between physical activity level and obesity; however, there is no definitive method for measuring physical activity level in children. This study will determine if test results of the Progressive Aerobic Cardiovascular Endurance Run (PACER) and the results of average activity levels recorded in the form of activity logs, including pedometer data, are an effective means of determining the individual’s risk of developing childhood obesity as measured using Body Mass Index (BMI). Seventy-six participants (n=37, boys n=39) in grades 3, 4, and 5 took part in a study comparing BMI to PACER and number of steps using a pedometer. Detecto Scale was used to measure height and weight which was converted to BMI, PACER was used to measure cardiovascular function, seven day pedometer logs were used to measure physical activity, and questionnaires were used to evaluate sedentary pursuits. Data were computed using the Pearson product moment correlation relating average steps in time to BMI, and PACER scores to BMI (r) to determine if a significant relationship existed. The results indicated the relationships between BMI and PACER, and BMI and pedometer steps were low, suggesting that a portion of this total variance may be explained by other measures (e.g., leg strength).

Scapular Strength in Presence of Scapular Winging and Tipping in Female Athletes Who Participate in Overhead Sports

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Female athletes who play overhead sports are prone to shoulder injury due to the repetitive motion, stress, and overuse of the joint. This study will investigate whether the strength of the surrounding scapular stabilizers, mainly the serratus anterior, correlate with the presence of scapular instability in the forms of winging and tipping. Prevention of shoulder injury may be feasible by knowing the correlation between scapular kinematics and scapular stabilizer strength. Our research hypothesis is that there will be an association between scapular strength and scapular winging and tipping. The subjects were 18-25 year old volunteer college level female athletes that participate in overhead sports. Subjects were excluded based on answers on a medical questionnaire. Observational classification of winging and tipping were taken statically and dynamically. Tipping and winging were measured with a bubble inclinometer and digital calipers, respectively. An isokinetic machine was used to measure strength of scapular protraction/retraction. Significant correlations were found between left scapular tipping measurements and peak forces, peak forces per body weight, and total work data. Significant inverse correlations were found between winging measurements and the same peak force, peak force per body weight and total work data. Although the numbers do not support our hypothesis, it is still reasonable to believe that there is a relationship between scapular dyskinesis and scapular strength.
Cardiovascular Fitness and Physical Activity Levels in Elementary School Children: An Examination of Seasonal Variation and Correlation

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This study examined seasonal variation in cardiovascular fitness and physical activity levels. It also examined the relationship between maximum oxygen uptake ($VO_{2\text{max}}$) and scores obtained from physical activity and self-perception questionnaires. The study involved 83 elementary school students in grades 3-5. The PACER was used to determine cardiovascular fitness, while a questionnaire was used for reports of physical activity levels. There was no significant difference in $VO_{2\text{max}}$ or physical activity levels in regard to season. Although the relationship was weak ($r=-0.074$ to $-0.262$), the correlation between $VO_{2\text{max}}$ and Physical Activity Questionnaire for Children (PAQ-C) scores was negative in all three months for third graders only. No significant trends were found among fourth or fifth graders.

The Relationship Between Physical Fitness and Standing Postural Deficits in Middle School Adolescence Ages 12-14

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Posture is the foundation for fitness. The most common cause of injury in adults is musculoskeletal. Prevention of such injuries starts with correct posture. Due to the limited information available on the relationship between physical activity and posture, this research attempted to determine if a significant correlation existed between the two in middle school adolescence ages 12-14. The subjects were chosen by a sample of convenience. All subjects were volunteers from the Maize Middle School physical education classes. The subjects’ physical fitness was tested using a group of assessments from the Fitnessgram. Each subject was assessed using the PACER, curl-up, push-up, and sit-and-reach tests in comparison to the appropriate age standard to determine a healthy fitness zone. Then each subject was assessed for posture using a Plexiglas grid. The subjects were positioned behind the grid, using the anterior lateral malleolus as the anatomical landmark for proper positioning to assess the posture at the levels of the ear lobe, the acromion, the posterior greater trochanter, and slightly anterior to the axis of the knee joint. The results were analyzed using the Pearson correlation to determine if there was a relationship between the anatomical posture landmarks and the individual physical fitness tests in the chosen population with females and males separated. It was concluded that there is no correlation between physical fitness and posture in females or males ages 12-14.
Endurance of Low Back Musculature in High School Athletes: A Study of Global and Isolated Low Back Stabilization Exercises

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Introduction: Low back pain affects 60-80% of the adult population due to various pathologies. Selective muscle atrophy has been demonstrated in people with history of low back pain. Training of low back musculature has focused on global and isolated abdominal endurance. The purpose of our study was to investigate the most effective stabilization program to improve trunk musculature endurance in high school athletes due to the lack of research in this population. Our hypothesis states that there will be a significant difference between the intervention groups and the isolated group will show the greatest improvement. Experiment: The participants consisted of thirty-nine high school students participating in one of three weight conditioning classes. Each class was randomly assigned into a control, global intervention, or isolated intervention group. Trunk endurance was tested prior to and after an eight-week trunk exercise intervention. Results: There was no significant difference between the isolated and global trunk endurance groups and the control group. Further data analysis showed no significant difference in endurance times between age, time, or gender.

A Comparative Analysis of OTC Plan B vs. Prescribed Plan B

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Introduction: With the introduction of emergency contraception, the likelihood of an unintended pregnancy can be reduced by up to 70% to 80%; however, limited access to EC, poor knowledge of its mechanism of action, therapeutic uses and adverse effects and lack of public awareness of its existence have weakened its potential benefits. Numerous studies have been conducted to determine if advanced provision of EC or OTC EC is more effective than prescription-only EC in minimizing the risks of unintended pregnancy. Methodology: An evidence-based systematic review of the literature was done using Medline, FirstSearch, and CSA databases from 1998 to the present. The MeSH terms utilized in the search were emergency contraception/EC; Plan B; OTC/over-the-counter; deregulation/registration; prescription; levonorgestrel. Articles were chosen based on the criteria that they were peer-reviewed, were randomized controlled trials, and that the information in the articles answered the research question. Results: Twenty-six articles met the criteria and were selected for review. The literature demonstrates that with accurate, adequate education there is little abuse potential with advanced provision of EC or OTC EC. The literature has also shown no evidence of increased frequency of unprotected sex or increased incidence of sexually transmitted diseases with unrestricted access. Conclusion: Increased access to EC through the establishment of OTC status or advanced provision results in a lower occurrence of unintended pregnancies than prescription-only EC.
A Comparison of Domestic Violence in African American, Asian, and Hispanic Women

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Introduction: Domestic violence is the most common cause of injury to women in the US. Types of intimate partner violence (IPV) range from emotional, physical, and sexual abuse to homicide. IPV accounts for approximately 40-50% of female homicide. Method: This evidence-based literature review compares domestic violence in African American (AA), Asian, and Hispanic women, including frequency, types, risk factors, and response. PubMed, CINAHL, First search, and Medline databases were searched using the key terms domestic violence, intimate partner violence, risk factors, culture/ethnicity. Studies included those from peer-reviewed journals that addressed the research question. Results: Women involved with male partners who have low education levels, low incomes, are alcohol or drug abusers, and who are unemployed are more likely to be victims of IPV. Other risk factors include women of young age, women who receive income from their partners, women with a history of STD, early onset of intercourse and a high number of sexual partners. AA and Hispanic women are at greater risk of IPV than Asian women. AA women between the ages of 15-45 have the highest homicide rate due to IPV. Asian women are more likely to view IPV as their own fault compared to AA or Hispanic women.

A Comparison of Online Vs. Traditional Classroom Instruction in an Undergraduate Pharmacology Course

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Introduction: Online instruction has become a vital element in higher education. Most published research finds no significant difference between online (OL) and traditional (TD) instruction. Purpose: Compare student satisfaction and learning outcomes of an undergraduate OL pharmacology course to a TD lecture course taught by the same instructor. Methods: The OL and TD courses for Fall 05 and Spring 06 Clinical Pharmacology used the same notes, text, learning objectives, and exams. Three validated surveys measured aptitude for OL instruction, preferred learning styles, and student satisfaction with the course and self-perceived progress on relevant objectives. Learning outcomes were objectively evaluated using exam scores and drop rates. Results: Mean satisfaction scores for both courses were high, generally > 4.0. Mean scores in the TD courses were significantly higher than OL courses with regard to overall course satisfaction, instructor’s displayed level of interest in students, and students’ perceived ability to share ideas, and self-perceived gains in factual knowledge, fundamental principles and application of material. Mean scores in the OL courses were significantly higher for perceived amount of coursework. There were no significant differences in objective exam scores or drop rates. Conclusion: Overall, OL and TD students taking this course had similar objective outcomes. Although the OL students were highly satisfied with the course and self-perceived knowledge gains, the OL satisfaction ratings were lower than those found in the TD courses.
Abstinence-Only vs. Comprehensive Sex Education, with emphasis on attitudes and behaviors of adolescents

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Adolescent sexual activity has become a growing issue within the United States. In 2003, the Youth Behavior Risk Survey showed that 46.7% of high school students had already been sexually active. In 2000, 9.1 million of the 18.9 million new cases of STDs came from young people age 15-24. Although the teen pregnancy rates had modestly declined in 2004 for girls 15-19, it slightly increased for girls 10-14. Due to these statistics, there is currently an ongoing debate concerning teenage sexual education in the United States and how to make a greater impact on adolescents’ attitudes, knowledge, and sexual behavior.

Purpose: to determine whether Abstinence-Only Sexual Education or Comprehensive Sexual Education has more of an impact on the attitudes and sexual behaviors of adolescents.

Methods: An evidence based literature review was completed using published studies involving Abstinence-Only Sexual Education and Comprehensive Sexual Education. These studies were then evaluated to determine which method has the greatest impact.

Results: Preliminary results show Comprehensive Sexual Education has more long lasting effects on attitudes and sexual behaviors of adolescents. Preliminary results also indicated that more randomized control trials, especially those directly comparing Abstinence-Only and Comprehensive Sexual Education, will need to be completed to further evaluate this topic.

Are gonadotropin-releasing hormone analogs and laparoscopic ablation equally effective treatments for endometriosis?

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Introduction: Endometriosis is a disease of the female reproductive system in which endometrial tissue exists outside of the uterus. Both laparoscopic ablation (LA) and gonadotropin-releasing hormone analogs (GnRHa) are treatments for endometriosis; however, no studies directly compare these two treatments. Purpose: This study compares the use of GnRHa therapy and LA regarding symptom relief and recurrence, side effects and improvement of quality of life in women ages 18-50 with diagnosed endometriosis. Methods: The study design is an evidence-based literature review, assessing 28 studies for level of evidence, design, inclusion and exclusion criteria, results and conclusions. Results: The majority of research involving GnRHa’s showed a relief of endometriosis symptoms up to one year post treatment. Side effects include bone mineral density loss and hypoestrogenemic symptoms. LA was found to successfully treat endometriosis symptoms up to one year as well and fertility rates did not consistently improve. Adhesion formation was a complication of surgery, but was found to correlate to the presence of adhesions prior to surgery. Conclusions: Research shows that endometriosis treatment is dependent on the patient’s desired results. While neither treatment is curative, LA is more costly, but beneficial in patients desiring symptom relief and opportunity for pregnancy within a year whereas GnRHa improve symptoms, but no improvement in fertility.
Are self-reported patient encounter data accurate?

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Introduction: Medical education programs are using Personal Digital Assistants (PDA’s) to facilitate the recording of encounters between students and patients during clinical rotations. Wichita State University Physician Assistant Program (WSU-PA) uses PDA’s to track clinical patient encounters during its clinical year. The WSU-PA clinical rotation at Pratt Regional Medical Center Emergency Department (PRMC-ED) provided an opportunity for a comparison of medical records and PDA entries made by students who spent 4 to 6 weeks at that site. Purpose: The purpose of this study was to verify the self-reported data submitted by students with the actual documentation on the medical record and identify any significant inconsistencies. Methods: Student submitted data of all patient encounters by WSU-PA students at PRMC-ED were compared to data obtained through review of medical records for patients seen by the student. The age and sex of the patient as well as the diagnosis of each visit were compared for consistency using HandEchart® Software and Microsoft Excel® Spreadsheets. Results: 32.16% of reported diagnosis matched the medical records, 24.69% of patient age matched the medical records, and 31.18% of patient sex matched the medical records. Conclusion: Data revealed an inconsistency between medical charts and PDA entries of patient encounters during clinical rotations at PRMC. The data that represented the age, sex, and diagnosis of patients encountered in clinical rotations by 2nd year PA students was consistent 1/3 of the time.

Comparison between Continuous Positive Airway Pressure Vs. Uvulopalatopharyngoplasty In Treatment Of Obstructive Sleep Apnea In Adult Males

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Introduction: Obstructive Sleep Apnea (OSA) is a condition characterized by repeated cessation of breathing throughout sleep which can occur 5-50 times in one hour and can last ≥ 10 seconds. This is usually caused by an obstruction in the airway, nose or throat. Treatments for OSA are widely available and include Continuous Positive Airway Pressure (CPAP) and Uvulopalatopharyngoplasty (UPPP). Methods: An evidence-based systematic literature review was completed acquiring studies regarding CPAP and UPPP in the treatment of obstructive sleep apnea in adult males. Medline and Eco were searched for articles that met the defined inclusion criteria: treatment of OSA with either CPAP or UPPP, dated 1981-2006, include adult males in the study, and have data pertaining to apnea index or apnea/hypopnea index. Patients were considered successful if their AHI, AI, or RDI (apnea and hypopneas) was decreased by ≥50% or if the end result was <20. Results: Forty-seven articles matched the criteria. These studies showed success of CPAP and mixed success/failure for UPPP. Conclusion: The most effective and successful treatment for obstructive sleep apnea in adult males is CPAP with a grade B recommendation. UPPP is recommended as second line therapy.
Comparison of Medication Treatment Versus Cognitive Behavior Therapy of Hoarding Behaviors in Obsessive-Compulsive Disorder

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Obsessive-compulsive disorder (OCD) can be difficult to treat due to patient non-compliance and treatment efficacy. OCD presents in behaviors of checking, washing, repeating/counting, and ordering/symmetry. Obsessions include harming, religious/sexual, slowness, pure obsessions and hoarding. Hoarding is the most difficult behavior to treat and is defined as the inability to throw away items that are useless. **Objective:** Determine the best possible therapy for individuals with hoarding behaviors comparing the use of psychotropic medications, cognitive behavioral therapy (CBT) or both. **Method:** An extensive evidence-based medicine (EBM) literature review was conducted using Medline, PubMed, and FirstSearch databases. Included articles were published in English between 1995 and the present. Studies were then ranked from Levels 1 through 4 based on the quality of the study design. **Results:** Of the studies included in the EBM analysis, one supported the use of medication along with CBT, four supported the use of CBT alone, three did not support the use of medications, one did not support the use of CBT, and one did not support either the use of medications or CBT. **Conclusion:** This analysis reveals a Level C recommendation for use of medications with CBT, medication treatment alone or CBT alone.

Decreasing Symptoms in Interstitial Cystitis Patients: Pentosan Polysulfate vs. Sacral Neuromodulation.

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**Objectives:** Oral pentosan polysulfate is the only FDA-approved drug for Interstitial cystitis. Sacral neuromodulation is a newer therapy for IC that has been FDA-approved in incontinent patients. Both therapies have studies documenting a reduction in IC symptoms, but no studies have compared the therapies to see which is more effective. **Methods:** An evidence-based systematic literature review was conducted using Pubmed, Medline, and Proquest nursing journals. Inclusion criteria were a peer-reviewed article, publish date of 1990 or later, level 1 or 2 evidence, were diagnosed with IC, and were only treated with either oral PPS or SNM during the study. Exclusion criteria were multiple treatments for IC or a non-IC diagnosis. **Results:** Three PPS studies fit all inclusion criteria. Successful treatment was defined as a 50% overall improvement in symptoms, studies had a success rate of 26-32%. Four studies fit the criteria for SNM. In these studies 40-94% of patients had a 50% improvement in one or more IC symptom. **Conclusions:** PPS and SNM have both been shown to reduce IC symptoms. SNM has been shown to have a higher rate of symptom relief in IC patients. Based on Level 2 evidence, a Grade B recommendation can be made for SNM. This evidence was limited by SNM studies having only Level 2 evidence, while PPS has Level 1 evidence studies. More studies are needed for each of these therapies.
Determining Clinical Assessment Sensitivity in Evaluating the Cervical Spine of Pediatric Trauma Patients

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Introduction: The National Emergency X-Radiography Utilization Study developed a decision instrument based on clinical criteria to help physicians identify patients who need radiography of the cervical spine. A decision instrument has not been developed for pediatric patients with possible cervical spine injury. Pediatric patients of blunt trauma have anatomical and developmental characteristics that make it difficult to assess their risk of cervical spine injury. Methodology: To determine if clinical assessment is sensitive enough to clear the pediatric cervical spine, a comprehensive literature review was carried out. Four articles were identified that fit the inclusion criteria set by this evidence based literature review. Results: To assess the pediatric patient it should be determined if the patient is “low-risk” or “high-risk.” The patient’s clinical stability can be assessed by the presence or absence of each of the five low-risk criteria. The patient is considered low-risk if there is an absence of the following criteria: midline cervical tenderness, evidence of intoxication, altered level of alertness, focal neurologic deficit, and presence of distracting painful injury. Non-verbal children are high-risk because they are unable to verbalize pain. Patients that meet low-risk criteria may be cleared. Patients considered high-risk should undergo plain film radiography. Conclusion: Clinical assessment performed well in children and reduced the number of children undergoing radiography. Caution is advised in applying clinical assessment to pediatric patients due to the small number of studies identified.

Does a Relationship Exist Between the Prevalence of Anterior Cruciate Ligament Injuries in Females and the Use of Estrogen and Progesterone Containing Contraception?

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Introduction: Women’s involvement in athletics has increased in the last 20 years. With this increase, there has also been an increase in injury rates. Female athletes are at a 4-8 times higher risk of sustaining an Anterior Cruciate Ligament Sprain (ACL) than male athletes. There have been research studies looking at endogenous hormonal influence on ACL injuries, but there is little research looking at the correlation between contraceptive use and ACL injuries. Purpose: This retrospective research study was conducted to determine if a correlation exists between prescription contraceptives and ACL injury rates in collegiate athletes. Methodology: Two hundred and fifty surveys were sent to collegiate volleyball and basketball coaches for distribution to female athletes. The survey included questions about the athlete’s history of ACL injury and prescription contraceptive use. Results: There was a 10.4% response rate. Of the 26 responses, 34% of the athletes have not sustained an ACL injury while using prescription contraceptives for >12 months. Conclusion: No conclusion can be drawn concerning this relationship due to a low response rate. Some research has shown an association between hormones and female ACL injuries; however, no definitive correlation has been proven.
Does The Awareness Of The Health Risks From Tanning Differ In An 18-30 Year-old Age Group Compared To A 31-55 Year-old Age Group? A Pilot Study.

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Introduction: Over-exposure to ultraviolet radiation, in particular from artificial tanning, is of considerable concern for public health. This study was performed to investigate whether or not perceptions of the harmful effects of artificial tanning, as well as the attitudes and behaviors, are different among different age groups. The results of the study will provide information on trends in sun protection knowledge, awareness, attitudes and behaviors, which can be compared between age groups. Another outcome will be to determine if continued education and comprehensive sun protection policy in communities, schools and healthcare facilities is warranted. Methods: A 29-item based questionnaire was designed and administered to a sample of Wichita State University students. Data focused on demographics to the opinions on tanning and sun protection behaviors, etc. The sample size included hundred 18-30 year-old and twenty 31-55 year-old participants. Results: Data is currently being analyzed using standard statistical methods. Conclusions: Data is anticipated to reveal that the majority of participants aged 18-30 years know the risks of tanning, yet they still choose to engage in activities that over-expose themselves to ultraviolet radiation. In contrast, it is anticipated that participants aged 31-55 years are aware of the risks of tanning; and their behavior is positively influenced.

Effect of a 10-Month Treadmill Walking Program on Target Behaviors in Youth with Autism

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The purpose of this study was to determine the effect of a 10-month treadmill walking program (TWP) on target behaviors (TB: maladaptive behaviors and/or stereotypic mannerisms) in adolescents and young adults with autism. Five youth (3 males, 2 females; 16.6±1.7 yrs) diagnosed by clinical psychologists as having severe multiple developmental disabilities with a primary diagnosis of autism, participated in this study. Participants were involved in a 10-month TWP (10-25 min sessions; speed 3.3-7.0 km•hr⁻¹, grades 0-2.5%) that was incorporated into their regular physical educational curriculum 3-5 times per week. Three TB were monitored 24 hours per day for each participant by staff and each behavior was recorded using a tally system. A single-subject quasi-experimental ABÁ research design was used to evaluate each of the participants. In this design, phase A represented 2-month baseline stage in which behavior was collected but no treadmill walking was performed, followed by a 10-month treadmill walking program (phase B) and another 2-month baseline stage (phase Á). Four of the five participants demonstrated effective results (ie, reduction in TB during phase B). Results of this study indicate that an exercise program similar to the one in this study introduced into the weekly curriculum of persons with severe autism could positively affect their behavioral goals.
Effectiveness of a Sepsis Response Team in the Treatment of Severe Sepsis and Septic Shock: a 20 Patient Feasibility Study

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The Society of Critical Care Medicine (SCCM) advocates use of a national data collection tool to measure compliance with treatment guidelines for severe sepsis. Some facilities utilize a Sepsis Response Team (SRT) to manage sepsis; however, their effectiveness has not been published. **Objective:** Provide information aiding in development of appropriate study methodology, utilization of the SCCM data collection tool, and resource expectations needed to perform larger-scale studies. **Setting:** 760-bed tertiary care teaching hospital. **Methods:** This feasibility study describes the process to form a multidisciplinary research team, select patients, create a paper data collection form, utilize the SCCM tool, and retrospectively collect data from 20 patient charts, 10 treated by a SRT and 10 treated by individual prescribers. **Results:** Mean hours required for chart abstraction became significantly less as the team gained experience with the abstraction process. Several SCCM data points were subjective, requiring a prospective team consensus of definitions to maintain consistency. Differences in some patient demographics were identified. Other confounding variables that may be encountered in a larger-scale study were identified and are discussed. **Conclusion:** Large-scale studies evaluating efficacy of a SRT using the SCCM tool will likely require significant resources and a multi-disciplinary team of researchers. A case-matched study design may be needed to mitigate population differences.

Effectiveness of Cardiac Rehabilitation Programs in Females Following an Acute Myocardial Infarction

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**Introduction:** The incidence of myocardial infarctions (MI) is increasing every year as are the concurrent morbidity (ie, disability) and mortality resulting from these events. While cardiac rehabilitation programs (CRPs) have demonstrated success in reducing risk factors for secondary events, the majority of these benefits have been reported in males. Whether or not the same outcomes occur for female MI patients as a result of CRPs has not been adequately addressed. The purpose of this paper is to review the literature in an attempt to determine if current CRPs are equally effective for both genders. **Methodology:** A systematic review of the literature was performed to evaluate the data on the outcome of CRPs for females from 1986 to 2006. Articles included in the review relate to female inclusion in CRPs and the resulting effectiveness in CRPs outcomes. **Results:** Results of the literature revealed twenty-two articles which were reviewed utilizing evidence based methods. Based on the literature, CRPs are not as effective for females. **Conclusion:** Despite rates of myocardial infarctions increasing significantly in females, current CRPs fail to adequately address the physical, emotional, and psychological differences between genders in terms of response and adherence to CRPs. Additionally, since clinical profiles vary from males to females, in that females often present at an older age with more comorbidities, the best approach to CRPs for females is unknown. This review hopes to shed more light on the need for CRPs more specifically designed to meet the specific needs and expectations of females.
Evaluating Differences in Patient Outcomes by Comparing Cognitive Behavioral Therapy vs Selective Serotonin Reuptake Inhibitors in Treating Body Dysmorphic Disorder

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Introduction: Body dysmorphic disorder (BDD) is a psychological disorder that involves the preoccupation of being excessively concerned with one’s appearance or slight physical feature. Any portion of the body may be involved, but many preoccupations involve facial features and skin. This disorder is extremely distressing and causes poor functioning as well as decreased quality of life. Methodology: A systematic review of the literature was conducted to determine whether differences in patient outcomes exist when using cognitive behavioral therapy (CBT) versus selective serotonin reuptake inhibitors (SSRIs) in the treatment of BDD. Articles reviewed included patients who met the Diagnostic and Statistics Manual of Mental Disorders (DSM-IV) criteria for BDD. Twenty-one articles addressing BDD, CBT, SSRIs, and treatment outcomes were reviewed using evidence-based methods. Results: After a review of the literature, it was found that aggressive treatment using both CBT and SSRIs together proved to be more successful in reducing patient reoccurrence rates than using either treatment alone.

Evaluation Of A Physician Assistant Student Admission Plan That Considers Race Neutral Factors

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Purpose: The purpose of this project was to evaluate race-neutral admissions criteria for PA applicants in order to make an impact on increasing the number of underrepresented minority (URMs) applicants to Wichita State University’s PA Program. Methods: This cross-sectional study analyzed admissions policies utilized in 2003, 2004, and 2005 in the PA Department at WSU. This project targeted applicants and matriculates into the WSU PA Program. Specifically, the study measured the ratio of minority applicants to matriculates into the class of 2005 (paper-based applicant criteria heavily weighted toward GPA), classes of 2006 and 2007 (expanded criteria with race-neutral factors, still heavily weighted toward GPA), and class of 2008 (expanded criteria with race-neutral factors, with equalization of GPA with other factors). Results: Overall the classes of 2005 and 2008 had more minority applicants than matriculates. The classes of 2006 and 2007 had more minority matriculates than applicants. Conclusion: The WSU-PA Program’s admission plan that considered race neutral factors did not have a significant impact on increasing the number of URMs accepted into the PA Program.
Evaluation of PTCA versus Stenting and Bare-Metal Stenting versus Drug-Eluting Stenting in the Treatment of Coronary Artery Disease
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Introduction: The risk of developing coronary artery disease (CAD) for both men and women is increasing in society today. Over the past twenty-five years, the concepts of percutaneous transluminal coronary angioplasty (PTCA) and stenting have become dominant modalities in the treatment of CAD. In the late 1970’s and early 1980’s, PTCA was seen as the best possible alternative to bypass surgery until repetitive treatments were required to reopen occluded arteries. Following the failure of PTCA, stenting and derivatives of stenting with drug-eluting compounds have been developed to examine the most effective revascularization technique to reduce the rate of coronary re-stenosis. Methodology: The purpose of this study was to perform a systematic examination of the literature to evaluate these techniques. Articles used included randomized controlled clinical trials of adults ranging from 50 to 75 years of age who had undergone either PTCA or stenting from the years 1979 to 2006. Key variables evaluated in the study were PTCA, stenting, and drug-eluting stents. Results: Thirty articles met the inclusion criteria and were reviewed using evidence based methods. Following analysis, the overwhelming consensus exists that the use of PTCA with stenting is more effective than angioplasty alone, and drug-eluting stenting is more effective than bare-metal stenting in the prevention of re-stenosis in patients with CAD. Conclusion: The most effective treatment for patients with CAD is PTCA with drug-eluting stenting.

Exercise capacity following heart transplant: case report on the physical work capacity of a 37 year old competitive cyclist following orthotopic heart transplant

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Physical work capacity in heart transplant recipients typically does not exceed 60% of age-predicted normal levels. It is unknown what levels might be achieved in these patients if they were involved in strenuous exercise training prior to transplantation. A 37 year-old, professionally trained male cyclist suffered an acute myocardial infarction immediately following a road race and received a heart transplant four months later. The participant resumed training for competitive cycling one month following the transplant. His peak VO2 was 92% and peak heart rate was 90% of age predicted values six months post transplant. Results indicate that for this participant, a more aggressive approach to heart transplant recovery was well tolerated and suggests that similar programs could be applied to other heart transplant recipients.
Kansas High School football coaches’ perception of the use of sports supplements in their players

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**Introduction:** Sport supplements have become increasingly popular, and more high school football players are experimenting with advertised “performance enhancing” supplements. Many of these athletes turn to their coaches for questions and advice regarding supplements.

**Purpose:** This project reflects Kansas high school football coaches and their opinions regarding sport supplement use in high school football players. **Methods:** An email survey was sent out to all Kansas high school football coaches regarding their knowledge and recommendations of supplement use in their athletes. **Results:** 53% of the coaches thought supplements were beneficial to a high school athlete, 32% were neutral, and 15% either disagreed or strongly disagreed. 80% of the coaches were aware of their athletes taking supplements. 72% of coaches recommended supplement use to their athletes. 70% stated they had received educational material regarding supplement use in high school athletes. 90% were interested in receiving information regarding sport supplement education in high school aged athletes if available. **Conclusion:** A wide degree of variation exists between different coaches and their thoughts and opinions regarding supplement use in high school football players.

Knowledge of Clinical Assessment, Diagnosis, and Treatment of Fetal Alcohol Syndrome: How Much is Taught in a PA School Curriculum?

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The effects of maternal alcohol use on their unborn children have been observed for millennia. These include abnormal facial variations, growth retardation, neurological or behavioral problems, decreased cognitive functioning, poor socialization skills, and attention and distractibility problems. Patients may have any degree of symptoms, from mild to severe, or any combination thereof, thus presenting primary care providers with the dilemma of correct diagnosis. The purpose of this study is to evaluate the curricula of the Physician Assistant education programs regarding clinical assessment, diagnosis and treatment of fetal alcohol syndrome. **Design – Cross sectional, evaluative survey. Participants – all US PA programs. Measurement - A responder from each PA program (either Director or faculty member) will be asked a series of 5 questions concerning knowledge of the disorder, diagnosis and treatment, and adequacy of the training provided. Data Analysis - Data will be analyzed using standard statistical estimates. Results - Analysis should reveal data that can be compared between schools, or saved for future research. Limitations of this study may include inadequate number of responses, unknowledgeable responder, intentional false answering, and/or design error.
Maggot Debridement Therapy in the Treatment of Nonhealing Chronic Wounds

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Background: Maggot therapy utilizes freshly emerged, sterile larvae of the common greenbottle fly, *Phaenicia* (Lucilia) *sericata* which secrete digestive enzymes that selectively dissolve necrotic tissue, disinfect the wound, and thus stimulate wound healing. Introduction: The purpose of this paper was to review the literature in an attempt to determine the efficacy of maggot debridement therapy (MDT) of skin ulcers (e.g. diabetic foot ulcers, venous stasis, osteomyelitis), with specific focus on assessing the healing time and amputation rate. Methodology: Efficacy was measured by comparing MDT to traditional treatment (i.e., antibiotics and surgical debridement). Level of evidence included case-control, cohort retrospective, retrospective, prospective control, non-randomized in-vivo, and report studies. Results: Overall results of the thirteen articles that met the inclusion criteria indicate that MDT healing time was equal to or significantly shorter and amputation rate was less than traditional treatment. Limitations: Limitations to these studies include minimal amount of subjects involved in each study, the inability to conduct randomized control studies and insufficient number of articles found. Conclusion: Preliminary studies confirm that MDT successfully accelerates debridement of long-standing chronic wounds leading to enhanced healing time and reduced amputation rates, making it a particularly safe and affective method in wound care.

Medical and Developmental Issues of International Adoptees with Emphasis on the Need for Immediate and Thorough Medical Attention Post-Adoption

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The rate of international adoptions in the US has more than tripled from 1990 to 2004, and continues to steadily rise. A large percentage of these orphanages are poverty-stricken, which leads to a shortage of nutritional food and a high orphan-to-caregiver ratio. These conditions relate to medical issues such a malnutrition, infectious disease, developmental delays, and behavioral disorders. Guidelines for the most cost-effective approach to medical evaluation of international adoptees have not been determined, but evidence suggests that there should be unique medical intervention for this specific population. The purpose of this study is to recognize these issues at hand, along with the necessity for immediate medical attention post-adoption. This is an evidence based literature review encompassing studies of medical problems seen in internationally adopted children, as well as the medical treatment received post-adoption. As the rate of international adoption continues to increase, so does the probability of caring for an internationally adopted child in a primary care setting. The health status of these children makes them one of the most high-risk pediatric groups in the US and a better understanding of diagnoses and treatment will improve their overall health.
Omega-3 Fatty Acids Compared to Placebo in Secondary Prevention of Myocardial Reinfarction

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**Introduction:** Significant research exists to support the use of omega-3 fatty acids in the primary prevention of coronary heart disease (CHD), however few studies exist to support the use of omega-3 fatty acids in those patients already diagnosed with CHD. This study aims to investigate the cardioprotective benefits of dietary and non-dietary intake of omega-3 fatty acids in patients diagnosed with CHD. **Methodology:** A systematic review of evidence-based literature was performed using Medline and Cochrane databases. Inclusion criteria included 1) randomized controlled trials (RCT) comparing dietary or supplemental intake of omega-3 fatty acids with a control diet or placebo, 2) trials reporting cardiac endpoints including fatal or nonfatal myocardial infarction and overall mortality, 3) trials following patients with established CHD for at least 6 months. **Results:** Six RCTs and two meta-analyses were included. Research shows supplementation with omega-3 fatty acids decreases the incidence of myocardial reinfarction, sudden death due to fatal cardiac arrhythmias, and all cause mortality. However, although individual studies reviewed were of high quality when compared their findings were inconsistent. **Conclusion:** There is insufficient evidence to recommend the use of omega-3 fatty acids for secondary prevention of myocardial reinfarction in patients with existing CHD.

Serum Selenium and the Risk of Prostate Cancer

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**Introduction:** The purpose of this study is to investigate the relationship of serum selenium levels and the risk of developing prostate cancer. **Methodology:** A systematic review evidence-based literature was performed utilizing the following search engines: MEDLINE FirstSearch, ArticleFirst, dissertations, and Paper’s First and a bibliographic search of selected articles. MeSH (medical subject heading terms) and text words utilized in this study include: serum, selenium, prostate, neoplasia, risk, nutrition, adenocarcinoma, male, prostatic intraepithelial neoplasm, and prostatic neoplasia. **Results:** The results of this evidence-based literature results are consistent with the epidemiologic studies available at this time. The best quality evidence suggests that higher selenium levels decrease a man’s risk of developing prostate cancer.
The Effects of Inhaled Fluticasone Propionate and Budesonide on Lung Function and Exacerbations in Patients with Chronic Obstructive Pulmonary Disease

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Introduction: Chronic obstructive pulmonary disease (COPD) is the 4th leading cause of death in the U.S. Although a proven and effective treatment for the chronic airway inflammation of asthma, the role of corticosteroids to treat underlying inflammation in COPD is controversial. The purpose of this study is to investigate the effect that inhaled corticosteroids, fluticasone propionate and budesonide, have on lung function and acute exacerbations in patients with COPD. Methodology: An evidence based literature review was conducted utilizing Medline, Cochrane Library, and ProQuest databases. Results: Nine randomized, controlled trials were found which specifically addressed the objective of this paper. Review of these studies indicates that inhaled fluticasone propionate has a significant effect on decreasing exacerbations, but not on the improvement of lung function. It was also discovered that budesonide had no significant effect on reduction of exacerbations or improvement of lung function. Conclusions: The results from this literature review are inconclusive due to conflicting and insufficient data. Therefore, a recommendation for the use of fluticasone propionate or budesonide to improve lung function and decrease exacerbations of COPD cannot be made at this time.

The Efficacy of Orlistat vs. Sibutramine in the Treatment of Obesity: A Systematic Literature Review

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Introduction: Since obesity is the second leading cause of preventable death in the United States, effective treatments are crucial in order to stop the progression of this epidemic. Currently, orlistat (Xenical) and sibutramine (Meridia, Reductil) are the only FDA approved obesity drugs for long-term weight loss in adults. The aim of this study is to compare the effectiveness of these two drugs in initial weight loss and long-term maintenance of that weight loss. Methodology: An evidence-based systematic literature review was conducted using the following databases: Medline, ECO, and Cochran. Articles chosen for inclusion were from 1990 to present, level 1 or 2 evidence and from peer-reviewed journals. Participants were over 18 years old with a BMI greater than 27 kg/m². Results: Both medications were shown to decrease baseline body weight equally by 5-10% as well as maintain that weight loss for up to two years when used in conjunction with a low calorie diet and exercise. Conclusion: There were 26 level 1 randomized controlled trials included in this systematic review, therefore a Grade A recommendation can be made regarding the use of either orlistat or sibutramine in a primary care setting for weight loss and management of up to 5-10% baseline weight. Both medications are effective for obese patients who have failed on diet and exercise alone.
Thyroid Dysfunction and Breast Cancer

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Introduction: A possible link between thyroid dysfunction and breast cancer has been debated, since thyroid extract was first used to treat breast cancer in 1896. Many researchers have suggested an increased risk of breast cancer in women with thyroid dysfunction and others have indicated a decreased risk. Purpose: To determine if there is a relationship between thyroid dysfunction and breast cancer in women. Method: An evidence based literature review using Medline, AbstractsFirst, and Cochrane using the terms: hypothyroidism, hyperthyroidism, thyroid dysfunction, breast cancer, and breast carcinoma. Criteria for article selection: publication in a peer reviewed journal, level 3 evidence or higher, and the relevance of the data to this study. Results: Twenty articles met criteria for this study: 9 show an association and 11 show no association. Conclusion: There is no definitive association between thyroid dysfunction and breast cancer. However, recent studies continue to suggest a biologic link between hypothyroidism and breast cancer etiology in post-menopausal women.

What is the Prevalence of Birth Defects in Infants Born to Mothers with Eating Disorders Compared to Infants Born to Mothers without Eating Disorders?

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Introduction: The prenatal period is critical in determining the quality of fetal development and how the infant develops outside of the womb. Many teratogens exist, but the medical literature evaluating fetal outcome in the presence of maternal eating disorders shows conflicting data. Methodology: The purpose of this study was to compare the prevalence of birth defects in infants born to mothers with eating disorders to those without eating disorders. This was an evidence-based literature review using the following inclusion criteria; women met DSM-IV criteria for anorexia nervosa, bulimia or eating disorders not otherwise specified; study made an attempt to eliminate confounding factors such as cigarette smoking or chronic disease; all articles were published in peer reviewed journals from 1980 to present. Results: Seventeen articles met the inclusion criteria. The occurrence of intrauterine growth retardation, small for gestational age infants, congenital malformations and developmental delays were found to be statistically significant. Conclusion: To avoid pregnancy complications and adverse fetal outcomes, clinicians should screen patients for eating disorders prior to conception and educate women on the possible effects of eating disorders on pregnancy outcome.
What is the Relationship Between a Soy-Rich Diet and the Incidence of Prostate Cancer?

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Introduction: Prostate cancer (PC) is the most common non-cutaneous cancer in the United States male population, and the second most common cause of cancer mortality. It has been proposed that dietary differences in Asian and Western men may be partially responsible for the lower incidence of PC among Asian men. The assumption that the Asian diet may be prostate-healthy is based on the fact that it contains many soy products. The purpose of this study was to determine whether there is a relationship between the consumption of a soy-rich diet and PC incidence. Methodology: A systematic review of evidence-based literature was conducted by examining peer-reviewed articles from the following databases: MEDLINE FirstSearch, MEDLINE PubMed, and Cochrane Library. MeSH terms utilized included prostate cancer/carcinoma, soy, soy-rich diet, prostate cancer incidence, and genistein. Results: The findings suggest there are benefits related to the consumption of a soy-rich diet, but none were shown to be conclusively preventive. Conclusion: More in vivo research must be completed before a statistically significant relationship between the consumption of a soy-rich diet and the incidence of PC can be substantiated.

“Keeping Pure Hearts”: Identity, Reminiscence, and Resistance in Okinawan Popular Music

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Since the early 1990s, Okinawans have been creating music, which mixes traditional min 'yo (folk songs) and shima uta (Island songs) with jazz, rock, reggae, folk, and other Western musical elements. The mixing of traditional and Western musical elements is referred to as “hybridization” or champuru. Okinawan popular music, also known as Uchinaa Pop, is unique in that it uses Okinawan indigenous language and the traditional instrument, sanshin. It will also be necessary to analyze the lyrical content, in which certain themes are embedded with Okinawa’s cultural values and worldview.

I will analyze Okinawan popular music as a symbolic construct to define such concepts as identity, reminiscence, and resistance as it is locally situated within the context of the historical and political framework. These concepts are not mutually exclusive, rather they are interconnected in meaning and purpose when it comes to interpreting and explaining Uchinaa Pop. This is a preliminary study, in which I will be conducting fieldwork in Okinawa, Japan in the summer of 2007.
Sedgwick County Archaeology GIS

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This multifaceted project primarily concerns the establishment of a Geographical Information System (GIS) database for the archaeology of Sedgwick County, Kansas. The database documents archaeological sites and surveys conducted in the county by the WSU City Archaeologist program and other entities. Documentation has been accomplished using ArcGIS software by ESRI and a digitizing tablet. This spatially locates the known sites and previously conducted surveys and includes the accompanying attributes of each of them. The final product is an electronic record keeping system for the WSU Wichita City Archaeologist Office. The paper records maintained for the past three decades had acquired many errors. The WSU and Kansas State Historical Society records have been coordinated and corrected. Inclusion of soil and vegetation type data provides the foundation for future growth of modeling prehistoric site distribution and findings are already showing promise. Modeling will allow professors, university students, and city, county, and state planners to study impact on finite cultural resources. The GIS project can function as a resource allocation tool. Limited survey and investigation capacity can be efficiently distributed toward the effort of cultural resource management. The project has an unlimited lifespan. Records are now easily maintained and updated. Inter-office data transfer can be performed electronically and with high accuracy. Adapting to advancing technology has been facilitated with conversion to digital files.

Agenda Setting and Samuel Alito: An Analysis of Five Networks’ Coverage of U.S. Supreme Court Hearings

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This study explores how the U.S. Senate Supreme Court hearings on the nomination of Samuel Alito were presented in news stories aired on five national network news programs. This research is based on McCombs and Shaw’s agenda-setting theory, which states that the news does not tell us what to think, but what to think about. With the expectation of differences in the way the Alito hearings were presented, this study looks at four areas within the Alito story: presentation, content, analysis, and story placement. Presentation deals with the order the issues are presented and the clips that are shown. Content examines what clips are or are not used. Analysis contains information on how each news station analyzes the hearings. Lastly, story placement looks at where the Samuel Alito hearings are placed in each newscast. The study focuses on the potential problem of viewers receiving different messages on the same issue therefore taking away different perspectives, instead of basic information allowing viewers to make their own decisions. The results confirm the notion that there are some differences in how the news story is presented, however there are a few similarities. This study concludes that the agenda-setting effects give clues to the viewer about how important a story is and what issues are important within the story.
Native American Voters: An Analysis of The Four Pillars of Persuasion

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This study examines the Four Pillars of Persuasion of the American Psyche in regards to Native American elections. To make a successful campaign advertisement, the candidate should have all four pillars present in their advertisement. The research examines randomly selected campaign advertisements from a Native American Election. This study scrutinizes whether or not these pillars exist in Native American elections and if they are necessary to emerge victorious. Results showed that all four pillars did not need to be present in order to win the election.

African American Adolescents: Family Structure and its Impact on Educational Aspirations and Sexual Activity

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Within the past few decades, African Americans have made much progress in educational attainment and educational achievement (National Center for Education Statistics, 2003). Thus, the gap between Caucasians and African Americans is slowly narrowing as more African Americans adolescents are completing high school and going on to college at an increased rate. Family structure and sexual activity have been linked to educational achievement (Krein et al. 1991). The purpose of the present study is to assess the relationship between family structure, sexual activity and educational aspirations for African American adolescents ages 12 - 17. The present analysis uses archival data collected as part of the Youth Empowerment Project, which surveyed various health and educational variables of 462 African American adolescents. Data collection consisted of pretest, posttest, 3-month, 6-month, and 12-month follow-up. The present study serves to address three empirical questions: 1) Is there a relationship between educational aspirations and family structure; 2) between educational aspirations and sexual behaviors; and 3) between family structure and sexual behaviors? Explanations as to the reasons why will be discussed and future research will be examined. The results showed there is a relationship between family structure and sexual behavior. The relationship showed educational aspirations did not decrease as a result of having a single parent. There was actually a negative correlation. As educational aspirations increased the number of parents in the home decreased, suggesting that having a single parent did not interfere with educational aspirations. The results also showed that as educational aspirations increased, sexual partners decreased.
Evaluating Differences Between Members of Consumer-Run Organizations

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Consumer-run organizations (CROs) serve as drop-in and activity centers for adults diagnosed with mental illness. These nonprofit organizations, which are entirely run by consumers (people diagnosed with a severe and persistent mental illness), provide social, recreational, and psychological support. This research examines these three aspects among two groups of CRO members: 1) new members (those who have been a member of a CRO for three months or less) and 2) existing members (those who have been a member of a CRO for one year or more). The sample consists of 100 randomly sampled participants, with 50 participants in each group. The study will compare the difference between self-reported measures of sense of community, recreational activity, and psychological well-being among the two groups using the Sense of Community Scale, Social Participation Scale, and the Herth Hope Index. A discussion of the possible effects that CRO exposure has on these factors will be provided. This study will support the hypothesis that increased CRO exposure contributes to increased social interaction, recreational activity, and psychological well-being.

Science to Service and Service to Science with Kansas Consumer-Run Organizations

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Consumer-run organizations (CROs) are run by persons with severe and persistent mental illness and provide a place for those with mental illness to interact with others in the community. The Self-Help Network: Center for Community Support and Research has been involved in several projects surrounding these organizations over the past ## years. These projects have integrated scientific research with service to the organizations. One example provided includes an organizational health assessment (science) with individualized reports to each CRO (service). The other includes technical assistance provided to CROs (service) that incorporates the development of a tracking report (science). A current, ongoing project with CROs is described, which includes two components. The first component is to develop a best practices model, and the second component includes measuring the effectiveness of these organizations and their impact on members. This project will use various types of data collection and analyses, including member interviews, observational data, staff interviews, comparison data, and quantitative and qualitative analyses. In addition, the partnerships developed between the National Institute of Mental Health (NIMH), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Self-Help Network, and CROs is discussed.
Intergenerational Mobility of Socioeconomic Status:
Comparison of Sons and Daughters

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Intergenerational mobility is of immense interest to social scientists, in part due to the persistence of the quest for the “American Dream”. Intergenerational mobility is a gauge of the opportunities each group has to increase their privilege, class, and income. In addition, mobility helps researchers understand the way our society creates class structures. Many studies have addressed intergenerational mobility, focusing on socioeconomic status (SES) of the fathers and its effect on their sons. Other studies have looked at father’s effect on son’s and daughter’s occupational mobility. The effect of father’s SES on daughter’s SES has been overlooked thus far in research. This study examined the intergenerational mobility of SES and if there are differences in the transmission of father’s SES to their sons and daughters. Secondary data analysis of the National Longitudinal Survey of Youth (1979-2002) was used for the analysis. An alternative model was created in order to examine three sets of relevant theories; individual, structural, and gender-level. Univariate, bivariate and multivariate ordinary least squares (OLS) regression were utilized for analysis. Bivariate analysis shows that men have higher SES than women. OLS regression results indicate that father’s SES has a positive effect on their children’s SES, net of other factors, but no statistical difference was found between sons and daughters.

4-oxocyclohexadienylidene-Substitued Porphyrinogen as an Electrochemical Anion Receptor

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Sensitive and selective detection of biologically and environmentally important anions has been a vast growing field in supramolecular chemistry. Much research has been devoted in designing sensors that can selectively recognize anions. Recently, we have reported an anionic and solvatochromatic sensor. (Scheme 1) In this investigation, the effect of various anions on the redox states of the porphyrinogen and its N-substituted analogues were studied. Cyclic voltammetry (CV) was employed to probe the changes in the redox potentials of the receptors upon complexation with anions. Upon addition of F- to porphyrinogen, a cathodic shift of ~560 mV corresponding to 1F complex was observed. The F- ion had the greatest effect on the porphyrinogen redox potentials while other anions gave modest shifts. DFT computational studies on the anion binding correlated well with the electrochemical results.

Scheme 1

1: R1=R3=H; R2=R4=CH2C6H5
2: R1=R3=H; R2=R4=CH2C8H5
Carbon nanotube-porphyrin/ naphthalocyanine hybrids for photo-induced electron transfer studies

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Single wall carbon nanotubes (SWCNTs), due to their unique mechanical and electronic properties, are among the most promising candidates for the development of optoelectronic and photovoltaic devices. Due to the insolubility of SWCNTs in various solvents, preparation of model systems involving donor-acceptor entities poses a problem. In this report, SWCNTs are solubilized via non-covalent, $\pi-\pi$ stacking with pyrene-functionalized with phenyl imidazole co-ordinating ligand and self-assembled donor-acceptor nanohybrids are formed with electron donors, Zinc porphyrin (ZnP) or Zinc naphthalocyanine (ZnNC). The nanohybrids are fully characterized by TEM, UV-Vis, NIR, and electrochemical studies. Efficient electron transfer from the ZnP or ZnNC donors to the SWCNT acceptors leading to the generation of the photo-excited state is confirmed by steady state and time resolved studies respectively.

Design and studies of photo-induced electron transfer in ‘Pacman’ type porphyrin-fullerene conjugates

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The design of donor-acceptor systems with varying proximities and the study of their photo-induced electron transfer processes are of current interest in artificial photosynthesis and solar energy conversion. Among these, the systems with defined intra-molecular distances and orientations are of particular importance to manipulate the efficiency of the electron transfer processes. In order to achieve the desired geometries, an efficient donor, zinc porphyrin (ZnP), was functionalized with an elegant acceptor, fullerene through a series of rigid linkers (Scheme 1), resulting in the so called ‘Pacman’ porphyrin-fullerene conjugates. These newly synthesized compounds are fully characterized using $^1$H NMR, UV-Vis, electrochemical and mass spectrometric methods. The evidence for interaction in the ground state systems was obtained from spectroscopic and computational studies. Electron transfer from the excited ZnP to fullerene was revealed by steady state and time-resolved emission studies.
Synthesis, Structural Elucidation, Electrochemical and UV/Visible Absorption Studies of Pyridyl-carotenoid Ligands to Rhenium (I) and Platinum (II).

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Condensation of all-trans-retinal and β-apo-8’-carotenal with 4-pyridylacetonitrile monohydrochloride were performed. UV-Visible absorption data in acetonitrile of the condensed ligands show a bathochromic shift in its $\pi \rightarrow \pi^*$ transition observed at $\lambda_{\text{max}} = 446$ and 502 nm from 380 and 458 nm respectively. X-ray data for the pyridyl-retinal ligand showed space group symmetry of P-1. Metal complexes of these ligands were further synthesized. Mass spectrometric analysis for the rhenium (I) complexes showed molecular ion peak at m/z (ESI) = 811 for the retinal while carotenal is observed at m/z (FAB) = 943. UV-Visible absorption data of the rhenium (I) complex showed solvatochromic behavior. The $\lambda_{\text{max}}$ of the short-chain was red shifted to 464 nm in acetonitrile and 511 nm in methylene chloride. The $\lambda_{\text{max}}$ of the long-chain was observed at 522 nm in acetonitrile and 612 nm in methylene chloride. UV-Visible absorption data of the platinum (II) complex of the short-chain also showed solvatochromism. It was observed at 458 nm in acetonitrile and 481 nm in dichloromethane. The $\lambda_{\text{max}}$ of the long-chain was observed only at 542 nm in dichloromethane. Cyclic voltammetry showed irreversible oxidation peaks for all ligands and metal complexes.

Study of Parallelism in Multi-join Queries

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With relations growing larger and queries becoming more complex, parallel query execution is an increasingly attractive option for improving the performance of database systems. In this study, we explore the issue of optimizing the multi-join query in a multi-processor environment through the parallel execution of the independent operations. The high degree of parallelism involved in query execution can be effectively utilized for scheduling the execution sequence of the joins in a multi-join query and to determine the optimized allocation of the processors for execution. For scheduling the join sequences, we propose several heuristic approaches to generate the query execution plan for both the general and bushy tree join sequences. The join sequence efficiency of scheduling scheme is measured by its average execution time of the query plans on a single processor system. Different query execution sequence will yield the different cost due to the variation in the cardinalities of the intermediate relations. Once the query execution plans are generated, we have to efficiently allocate the parallel processors for these joins in order to attain the minimum execution time for the complete query. In inter-operator parallel execution of queries, we have the constraint of dependant joins which creates idle time for the various processors. We can use the synchronous execution time for allocating the processors after the query plan is generated, top down approach or the number of processor is determined at the same time when the tree is built, bottom up approach. The effectiveness of these approaches is evaluated through the simulation.
The Inverse Boundary Condition Problem from Finite Sets

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Let $u$ be a solution of an elliptic second order differential operator $P$ defined on a simply connected domain on the plane. We investigate problems with Robin boundary conditions when the value of the solution is known only for a finite number of interior points. The problem here is to estimate the boundary operator $l(u)$ from this data. We obtain these results using a technique based on a priori weighted estimates of Carleman type. For example, applications of these problems include restoring the reflection properties of obstacles of a given form from scattering data.

Fast Language Token Recognition Algorithm Applied to Increase Performance of Internet HTTP Web Servers

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We present a paper, computer programs, and source code which enable fast recognition of a finite set of language tokens. The recognition algorithm can write the source code for a computer program which provides a recognition function for any list of keywords. The resulting input recognition time is minimized and results in a 20% improvement for HTTP transmission speed, and much higher improvement for markup language parsing such as XML and HTML. The recognition system is also applied to determination of Multipart Internet Mail Extension registered file types, to spam filtering, and web-based email applications.
Uniqueness of Density with Many Boundary Measurements

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We establish the uniqueness of density \( f = f(x) \) in the elliptic partial differential equation
\[- \Delta u + c(x,u) = f.\]
There are several important cases we consider, where \( c \) is known, a function of only \( u \), or a function of both \( x \) and \( u \). We seek the solution for the coefficient \( c \) and for the potential \( u \), which together determine the density function in the interior of the domain.

The Picture Word Inductive Model and Vocabulary Acquisition

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The purpose of this quasi-experimental study was to determine if students’ vocabulary acquisition is enhanced with the picture word inductive model (PWIM), a research-based method of vocabulary instruction. During instruction with the PWIM, students were shown a picture and were asked to identify items in the picture, eliciting words from the children’s listening and speaking vocabularies. This process essentially created a picture-word dictionary which the students could employ to connect words with corresponding pictures. Additionally, participants received their own copies of the listed words on flashcards and independently reviewed the flashcards, reading each word and referring to the picture-word dictionary if necessary. Individually and with partners, students also classified and reclassified the words into different categories. The experimental group of 14 second graders participated in the 4-week intervention, while the control group, consisting of students from the two other second grade classes, did not receive this intervention. The PWIM intervention was analyzed through nonparametric statistics by examining the vocabulary gains that students made from the pre-assessment to the post-assessment. Additionally, gains of English language learners (ELL) and native-English speakers were compared. Further, gains of the experimental group participants and the control group participants were compared. Results indicated that statistically significant differences were achieved between the control and experimental group participants on the final assessment.
Expanding High School Math Curriculum

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Over four years ago, the math department at El Dorado High School was faced with a problem of an increasing number of students who were not successful in Algebra I. Those students were failing both at first semester and second semester. Large numbers of students were taking only the required credits of math to graduate. Faced with this knowledge and knowing that graduation requirements for math were going to increasing for future classes, the math department made a decision to create two new math classes: Transition Algebra that is between Pre Algebra and Algebra I; and Transition Geometry that is between Algebra I and Geometry.

Three years after the first students began taking those classes, we would like to answer several questions through our research. By examining students’ grades in Pre Algebra, Algebra I, Geometry, Algebra II and Trigonometry in the three years prior to implementing the new math classes and the three years after students could take the new math classes, we will answer the question: are students more successful in their math classes? By tracking what math classes students take once they enter El Dorado High School, we will answer the question: do more students take math classes beyond the required credits to graduate? And finally, we will compare the last two questions to answer the overall question: have these two math classes met a need for our students that previously was unfulfilled?

Constructing Identities: How students, teachers and program facilitators have constructed their identities through their involvement within a private high school laptop pilot initiative.

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Schools throughout the country are introducing technology initiatives such as providing students with laptops, without considering how the technology will affect the school personnel and students. Providing students with 24-hour access to technology challenges the way schools operate. This study examines how the participants in a one-to-one laptop pilot project, consisting of 19 students and 5 teachers, and 2 program facilitators, understand their involvement with the pilot as they interact within a traditional, private high school culture. Through the conceptual lens of Weick’s Organizational Sensemaking, this researcher investigated how the individual participant’s identities evolved throughout the school year as they interacted with sometimes conflictual situations with their colleagues in similar roles. Using data from focus groups, electronic narrative surveys, right and left hand case column method, and the researcher’s reflexive journal, findings in this case study are expected to draw parallels with Weick’s framework as students, teachers and the researcher-participant become more enactive of their environment and understand their changing roles.
BMI Changes in High School Football Linemen Transitioning From Senior Year to College

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An elevated Body Mass Index (BMI) has been linked to increasing risk factors for developing cardiovascular disease and other life threatening conditions such as diabetes. In addition, the rate of this increase can intensify risk factors and increase the difficulty of weight loss. **Objective:** To identify BMI increases among the 2005 graduating class of 5A and 6A high school football lineman as they enter into a Division I college program during the 2006 season. **Methods:** Rosters from 2005 High School (HS) seniors in the Wichita area and incoming 2006 freshmen in Division I college football programs (COL) were used to retrieve the height and weight of linemen. These values were then used to determine height and weight of the incoming class of 2006 linemen. This data was used to determine the BMI (wt / ht^2) of each athlete; comparisons were made between the HS and COL linemen regarding BMI risk factor stratifications. **Results:** A significant difference between all categories was reported, the height difference between the groups was 2 inches (increase of 2.7%, p≤0.05), weight increased by 34 pounds (increase of 13.3%, p≤0.01). BMI of lineman increased by 8.4% (28.69 ± 3.71 to 31.31 ± 3.38). **Conclusion:** Results suggest that football lineman shifted from a BMI classification of ‘overweight’ in high school to a classification of ‘category I obesity’ during their transition from high school to their first collegiate weigh-in. The rapid gain in weight increases the athletes’ risk factor levels from low to moderate in a matter of months.

Reliability of Wheelchair Transfer Testing to determine the Physical Work Capacity of a 26 Year Old World-Ranked Wheelchair Quad Tennis Player with Arthrogryposis

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Traditional exercise testing for wheelchair confined subjects are arm crank ergometry tests. A transfer test is proposed as an alternative protocol, due to limited arm mobility associated with arthrogryposis. **Purpose:** To assess the reliability of a maximal aerobic capacity transfer test performed on an individual confined to a wheelchair living with arthrogryposis. **Methods:** A 26 year-old, world-ranked wheelchair quad tennis player with arthrogryposis underwent 3 identical multi-stage wheelchair transfer tests, 3 days apart, to measure maximal oxygen consumption (VO_{2max}). The individual performed transfers between chairs at an increasing tempo until exhaustion. Respiratory exchange ratio was measured and max respiratory exchange ratio and max heart rate were used as indices of metabolic stress at the end of the VO_{2max} test. **Results:** Data from Tests 1 and 2 (19.0 and 22.1 ml·kg^{-1}·min^{-1}) show an increase in aerobic capacity between tests by 14%. An increase in VO_{2max} (6%) was significantly lower between Tests 2 and 3 (22.1 and 23.6 ml·kg^{-1}·min^{-1}). Maximal heart rates were consistent through the 3 tests (181, 179, and 179 bpm). **Conclusions:** These data suggest that arthrogryposis patients with limited upper limb mobility can safely perform a maximal graded exercise test by means of transferring and that a familiarization test is necessary for reliable assessment of oxygen consumption.
Effect of Ground Roughness on Aircraft Trailing Vortices

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The vortical wake of an airplane poses a great threat to following aircraft when flying near
the ground. The changes in altitude and bank angle, resulting from a wake encounter, are most
dangerous to an aircraft when it is flying close to the ground. Previously, the authors focused on
understanding and predicting vortex motion in ground effect. Knowing this motion allows pilots
to avoid the wake of other aircraft. Here, the authors examine possible ways of accelerating the
decay of these flow structures using terrain roughness. There is anecdotal evidence that suggests
that manipulating the shape of the terrain can affect the dynamic instabilities of the vortices.

The work presented here is aimed at investigating the effect of the terrain roughness on the
behavior of aircraft wake vortices. The tests are conducted in the water tunnel with a smooth
ground plane first. Then, streamwise ridges are added to the ground in order to simulate terrain
roughness. In addition, a case is presented without the ground plane. This data, showing the
behavior of the vortices in the absence of any ground, provides a basis for comparison as well as
allowing calculation of the wake vortex strengths.

The experimental data shows temporal and spatial behavior of the vortices. In the cases
without a ground plane and with a smooth ground plane, the water tunnel measurements are
consistent with information in the literature. With the information garnered from these tests, the
authors are able to quantify the effect of ground roughness on wake vortex behavior.

Local Bending Containment in Impact Damaged Sandwich Panels

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The residual strength and behavior of impact damaged sandwich panels are governed by the
amount of non-visible core damage underneath the face sheets. The failure modes under in-plane
compressive loading are either due to crack precipitation from the damage zone or unstable
dimple propagation across the width. In both cases, the local bending of face sheet (dimple)
triggers the final failure sequence. Thus containment of this local bending by reinforcing the core
cells in the damage region will mitigate the failure initiation and thus increase residual
properties. In order to arrest the local bending due to the impact damage in residual strength
tests, a small hole was drilled using a drill bit in the damage area and the honeycomb cell is filled
with resin. The core failure is less likely in this case compared to the case with panels having no
resin fill. The effect of drilling and filling resin with a single hole at center of the impact damage
region and multiple holes on the same region is being investigated.
A Graphical User Interface for a Unified Compensator Design Procedure

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In the field of control theory, compensators are used when a control design does not meet the intended design specifications. Some examples of these design specifications could be percent overshoot (P.O.), settling time ($T_s$), steady-state error ($e_{ss}$) for a specified system type, gain margin, and phase margin. This paper will deal with continuous-time compensators. Some of the different types of compensators that will be discussed are the proportional-derivative (PD), proportional-integral (PI), and proportional integral lead (PI-lead) compensators. This paper will discuss a compensator graphical user interface (GUI) implemented using Matlab. This GUI enables the user to design a compensator using two different methods that are based on a unified design procedure developed previously by the authors. The first method uses root locus. The second method uses a Bode plot. By making both the root locus and Bode plot available on the GUI, the user can compare the distinct advantages of either design methods in order to meet the desired design specifications.

A Novel Approach towards Privacy Protection in RFID Systems

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Radio Frequency Identification (RFID) tags are tiny microchips with small antennas that are set to replace Universal Product Code barcodes as a means of identifying objects, or products, in the near future. Widespread RFID use is expected to result in improvements in a variety of areas such as inventory management, healthcare record-keeping, consumer shopping experiences, smart home appliances, et cetera. However, adoption of this new technology has raised numerous security and privacy concerns, amongst both consumer privacy advocates and industry analysts. This paper analyzes the various threats to privacy that arise as a result of RFID use in a consumer environment. It considers an approach to privacy protection using basic RFID tags equipped with computationally constrained features. The author proposes an enhanced scheme for privacy protection along with an associated security model for RFID systems. The proposed scheme is evaluated using an analytical model and computer simulations. Results indicate that the proposed scheme results in better privacy protection as compared to methods already in academic literature.
A Unified Approach to Stabilize an Arbitrary Order Discrete or Continuous Time Transfer Function with Time Delay Using a PI Controller

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The object in this paper is finding the stability regions of an arbitrary order discrete or continuous time transfer function with time delay. The stability bounds of the proportional integral (PI) controller are found in terms of the proportional (Kp) and integral gain (Ki). The delta operator is used to describe the controllers because it provides not only numerical properties superior to the discrete time shift operator, but also converges to the continuous time derivative operator as the sampling period approaches zero.

The advantage of this method is that designers can find the stability boundaries when only the frequency response and not the parameters of the plant transfer function are known. A unified approach allows us to use the same procedure for finding the discrete time and continuous time stability regions. If the plant transfer function is known, the stability regions can be found analytically. Regions where phase and gain margin in specifications are met can also be found.

Influence of Codecs on Adaptive Jitter Buffer Algorithm

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Transmitting real-time audio or video applications over the Internet is a challenge in the current technology. The motivation for deploying real-time applications includes the reduction in voice communication overheads and the enhancement of services. Voice over Internet Protocol (VoIP) provides improved features like flexible call routing, unified messaging and call center and network multimedia applications. This in turn provides reduced costs and improvises services for distance learning, customer support, and remote sales presentations.

The integration of voice, video, and data encounters a variable amount of jitter and delay. Typically packet loss ranges from 0 to 20 percent and one-way delay from 5 to 500 milliseconds. Reducing jitter delay involves buffering of audio packets at the receiver so that the packets arrive sequentially on time at the destination. Adaptive jitter buffering at the receiver improves the quality of voice connections on the Internet.

In this study, a model was proposed to further enhance the existing jitter buffer model to change the voice codecs dynamically. Voice codecs were changed from higher bit rate to lower bit rate during an established call session based on jitter buffer value. Performance of the proposed algorithm was studied with respective to voice-quality, packet loss, bandwidth utilization and session set-up delays.
Isolating a Single Qubit in a Multi-Qubit System

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Quantum computing, a whole new paradigm to computing, is based on using Quantum Mechanics for computation. The basic element in a quantum computer is a quantum bit or a “qubit” which is a two-state physical system. A quantum computer comprises several qubits interacting with each other. Manipulations are performed on single qubits and multiple qubits to realize different operations. These operations are called “gates”. Just like the NAND gate is a universal gate in classical computing, there are a set of gates universal to quantum computing. It has been shown that single qubit gates together with a two-qubit Controlled-NOT (CNOT) gate is universal for quantum computing, that is, any operation within a quantum computer can be decomposed into a series of single qubit and CNOT gates. However, in a quantum computer having nearest-neighbor architecture, each qubit is coupled to several qubits adjacent to it. Therefore, to perform a gate operation on a single qubit, it needs to be isolated from the qubits adjacent to it by switching off the coupling. This greatly increases the complexity of the control circuitry. We show here how this problem can be overcome by designing a method whereby a single qubit can be isolated in a multi-qubit system without having to switch off the coupling.

Mapping a Controller From The S-Domain to Z-Domain Using Magnitude Invariance Method (MIM)

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We are presenting a new approach for mapping a continuous time controller to discrete time controller. Methods traditionally used for this mapping include forward rectangular rule, bilinear rule and zero-pole matching. This approach, unlike these other methods, produces a discrete time transfer function with a magnitude response exactly same as its analog prototype. To achieve this objective we are using the Magnitude Invariance Method (MIM) which was recently proposed in the field of signal processing. The step responses of the closed loop systems obtained using this approach will be systematically investigated to evaluate the effectiveness of this mapping.
Modified PM Generator for Low rpm Wind Turbine

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A modified tractor alternator is designed and constructed to suit a 300 Watts low speed, high altitude wind turbines. The tractor alternator does not produce required power output for the given speed of the turbine. A modification was thus required, and hence this report deals about the redesign and construction techniques.

The major issue with the small wind turbines is the cogging torque, especially when permanent magnet alternators are used. It is very useful to have a wide range of operation for the small wind machines, and thereby the reduced cogging torque will allow the turbine to generate power for low wind speeds. Some techniques like skewed and multiple stator stacks are implemented. Also, various connection techniques for better power extraction are discussed and compared. The report deals with all the design aspects, the topologies, modeling and testing of the alternator. The final results are not up to expectation, nevertheless, some promising results are obtained. All major results are presented and further modification prospects are discussed as well.

Network Control of Magnetic Levitation System using Scheduling Method based on Maximum Allowable Delay Bounds

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In feedback control systems, it is important that sampled data should be transmitted within a sampling period and that system stability should be guaranteed. While a shorter sampling period is preferable in most control systems, for some purposes it can be lengthened up to certain bound within which stability is guaranteed in spite of the performance degradation. This is the maximum delay bound. A new scheduling method for network-based control system has been recently developed. This method which is based on the maximum delay bound, guarantees stability of the network-based control system. In this paper we will demonstrate how this method can be used for network-based control of magnetic levitation system. We will demonstrate the stability of this system.
New Alternate Routing Scheme with Endpoint Admission Control for Low Call Loss Probability in VoIP Networks

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Call Admission Control (CAC) is an extension to Quality of service (QoS) for voice traffic over IP and prevents the over subscription of Voice traffic. For real-time delay-sensitive traffic such as voice, it is better not to initiate a new voice session rather than to allow voice sessions to be dropped or delayed later, causing intermittent impaired QoS and resulting in customer dissatisfaction. Dynamic routing mechanisms can be integrated with CAC to further extend the capabilities of QoS for VoIP traffic. In dynamic routing mechanisms, probe packets are sent to sense the congestion level of the network and according to the defined threshold, routes are chosen dynamically. CAC is therefore a deterministic and informed decision that is made before a voice call is established to provide suitable QoS for the new call.

All of the dynamic routing mechanisms have some issues in selecting random routes. This includes not considering number of hops, not doing admission threshold test, calculating all possible paths, and thereby wasting CPU time. In this research work, authors propose a new dynamic routing scheme, which considers a route history table with endpoint admission control. The main objectives of proposed approach is to increase the call admission probability, make call establishment time faster and save valuable CPU resources. Performance of the proposed scheme with respect to other dynamic routing schemes is studied using a mathematical/analytical model.

Security in IP Storage Networks

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Network security is a very important parameter and is always been a challenge for the emerging technologies especially for high-speed data networks. The storage industry is sprouting at a faster pace with efficient and faster methods of data transfer and storage. Security should be camouflaged with these methods from the beginning in order to provide reliable and secure access to the users. Some known protocols in IP storage networks, which are reliable on IP networks, are iSCSI, FCIP, and iFCP. These protocols use IP networks for data transport and it is necessary to provide a secure channel over these networks. As IP networks were not traditionally designed with security in mind, different mechanisms like IPSec are used for securing data at the network layer. Protocols like iSCSI does not provide per packet protection techniques. Both FCIP and iFCP do not have an in-band security mechanism. Hence iSCSI, iFCP, FCIP rely on IPSec authentication and confidentiality. Since Storage Area Network (SAN) consists of block transfers between the clients and the server, encryption and cryptography need to be implemented for each block being transmitted and received along with the control data. Though block level security provides more reliability, it can be more time consuming and costly. In this research work, authors propose a novel security mechanism for IP storage networks that can be implemented with any protocol using object-based data transfers. Effect of this new security mechanism over data throughput, CPU utilization, session setup delays, and overall end-to-end delay are studied and analyzed using an analytical model with respect to file-based transfers.
Transport of Flight Critical Data over Internet Protocol

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The growth of the Internet in recent times can be attributed to people’s need to access information quickly. This, combined with the need to provide seamless connectivity to mobile users, has led to the development of multiple mechanisms to keep up with user demand for reliability and security. The recent events affecting the critical infrastructures of the nation indicate the vulnerability of these systems, and highlight the importance of the work that needs to be carried out to provide assurances for their safe and efficient operation.

The aviation industry forms an important component of the nation’s critical infrastructure. By considering the issues involved in protecting the operational aspects of the aviation industry, in conjunction with the introduction of Internet access within an airplane, the authors present the possibility of providing an additional path for the transport of critical content between and airplane and ground stations.

Unassisted Aircraft Landing via Co-operative Data Exchange

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The Air Traffic Controller (ATC) is required to maintain a safe and orderly flow of airplanes in any airport. A fairly recent incident at the Los Angeles Airport (LAX) caused a blackout to the entire Control tower and resulted in a number of aircrafts being stranded in the air, due to the lack of communication with the ATC. This incident has caused widespread concern in the aircraft community and needs to be addressed so that future occurrences can be avoided.

In previous research work, the authors demonstrated the ability of an aircraft to communicate with ground stations via Internet Protocol (IP), utilizing satellite links. Several aircrafts in the vicinity of each other will utilize the same satellite link to communicate with the ground. In this work, the authors propose a system for aircrafts in the same airspace to communicate with each other, via IP, thus forming an Ad-Hoc Network. This brings about the possibility of exchanging information between aircrafts and co-operative unassisted landing of an aircraft in worst case scenarios.
Experimental study of the effect of a solid lubricant on sliding high current contacts

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The Electro Magnetic Rail Gun on board with Navy consists of high current carrying copper rails. A projectile carrier or armature slides over these rails with very high velocities. Inefficient sliding contact conditions between these two produces high rail wear. This restricts life of rails to ten shots. This research aims at finding effect of soil lubricant contact conditioner on these sliding electrical contacts which can help in increasing the rail life. The actual working conditions are simulated with an instrumented Pin-on-Disc setup. The setup is used to perform Static, Circular and Spiral sliding tests to estimate key quantities of interest such as contact resistance, coefficient of friction, amount of material transfer and wear. Tests are carried out at different current densities and contact force combinations, with and without use of conditioner. Test results show, use of solid lubricant conditioner reduces coefficient of friction in sliding, decreases amount of material transfer or wear but increases contact resistance.

Beam Engine Powered Circular Sawing Machine

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In this project, the output of a Beam Engine is used to drive a circular saw to cut timber. Here, instead of the rotating fly wheel, it is intended to have a rotating circular saw. This rotating circular saw is used to cut timber. Circular saws driven with electric power are a common feature. But in places where electricity is scarce, or absent, it is difficult to operate these equipments. But since the Beam Engine powered saw runs on fuel, it can be operated even in places where electricity is totally absent. A beam engine is a design of stationary steam engine. A stationary engine is an engine that does not move. Usually, a stationary engine is used not to propel a vehicle but to drive a piece of immobile equipment such as a pump or power tools. In a beam engine, the piston is mounted vertically, and the piston rod does not connect directly to the connecting rod, but instead to a rocker or beam above both the piston and flywheel. The beam is pivoted in the middle, with the cylinder on one side and the flywheel, which incorporates the crank, on the other. The connecting rod connects to the opposite end of the beam to the piston rod, and then to the flywheel.
Crevice Corrosion Mechanisms and Prevention Methods

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This paper reviews theory and mechanisms of crevice corrosion as well as its prevention methods. Crevice corrosion is a type of localized corrosion that can be found within crevices or at shielded surfaces where a stagnant solution is present. It is one of the most frequently encountered forms of localized corrosion and at the same time one of the most harmful ones because it happens in the alloys that normally exhibit perfect corrosion resistance such as stainless steel and it also occurs in areas that are not immediately visible. Therefore crevice corrosion may lead to sudden devastating failure of the metal in service. Crevices make a chemical environment which is different from that of freely exposed surfaces and therefore accelerate corrosion. This environment keeps moisture, traps pollutants, concentrates corrosion products and meanwhile excludes oxygen. Most cases of crevice corrosion occur in near-neutral solutions in which dissolved oxygen is the cathode reactant. So far several protection methods against crevice corrosion have been developed including cathodic protection and using inhibitors and coatings. Hot wax dip method and sealing crevices with polysulfide are two popular protection methods currently used in automotive and aerospace industries respectively. However researches about this devastating type of corrosion still continue.

Determination of Damage Area of Pressure Wall Impacted by Space Debris at Hypervelocity using SPH

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Space debris or space junk, are objects in Earth orbit consisting of small fragments from spent rocket stages and non-functional satellites. Accumulated in the lower earth orbit, these could cause considerable damage to the spacecraft orbiting around the earth. Hence it is necessary to develop ways to protect the newly placed spacecraft from the debris. The motivation for the project stems from the current NASA EPSCoR grant for designing a portable friction stir welder intended to repair the damage to the spacecraft. The development of this system requires an understanding of the extent of damage caused to the spacecraft shielding, which typically consists of a double bumper system ahead of a pressure wall. The current goal of this project is to determine the damage area of the pressure wall using the Smoothed Particle Hydrodynamics (SPH) meshing. The approach was to model and validate the damage area due to the hypervelocity impact technique (HVI) and to conduct a parametric study for various impactors and impact scenarios. The software tool used for both modeling and analysis was LS-DYNA, a non-linear finite element dynamic analyzer. Simulations were performed using a spherical projectile initially and later extended to varying impactor shapes. The materials for the plate and impactor were alloys of Al (6061-T6, 1100-O, 2219-T87, 2024-T4). It was observed that the SPH meshing method provided a valid means of predicting pressure wall damage due to HVI.
Two different delamination mechanisms that need to be controlled by the drill geometry and thrust force will be observed in the drilling of composites. The studies which have been done up to now focus on the thrust force aspect and drill bit geometry at a constant feed rate. It is possible to find a feed rate at the beginning of the penetration that corresponds to the rate at which the laminates are peeled out. Moreover, at the exit, the fiber push-down mechanism is active, which can be controlled by controlling the maximum thrust force. Thrust force itself depends on the feed rate, so there should be a “feed rate-depth” graph minimizing the delamination. This implies that the feed rate may need to be changed from high to low as the drill bit enters and exits. To find the best result several experiments are being run at the constant feed rate. Some of these feed rates will give reduced fiber pull outs at the entrance and some will result in acceptable fiber push downs at the exit. The best graph will be extracted by analyzing the delamination for each feed rate. For measuring, a microscope should be used to determine the areas with the maximum delamination along the cross section of the hole. Also measuring the surface roughness is another method of determining the delamination, but it should be done at a certain depth at the entrance as well as exit, not all of the thickness at once.