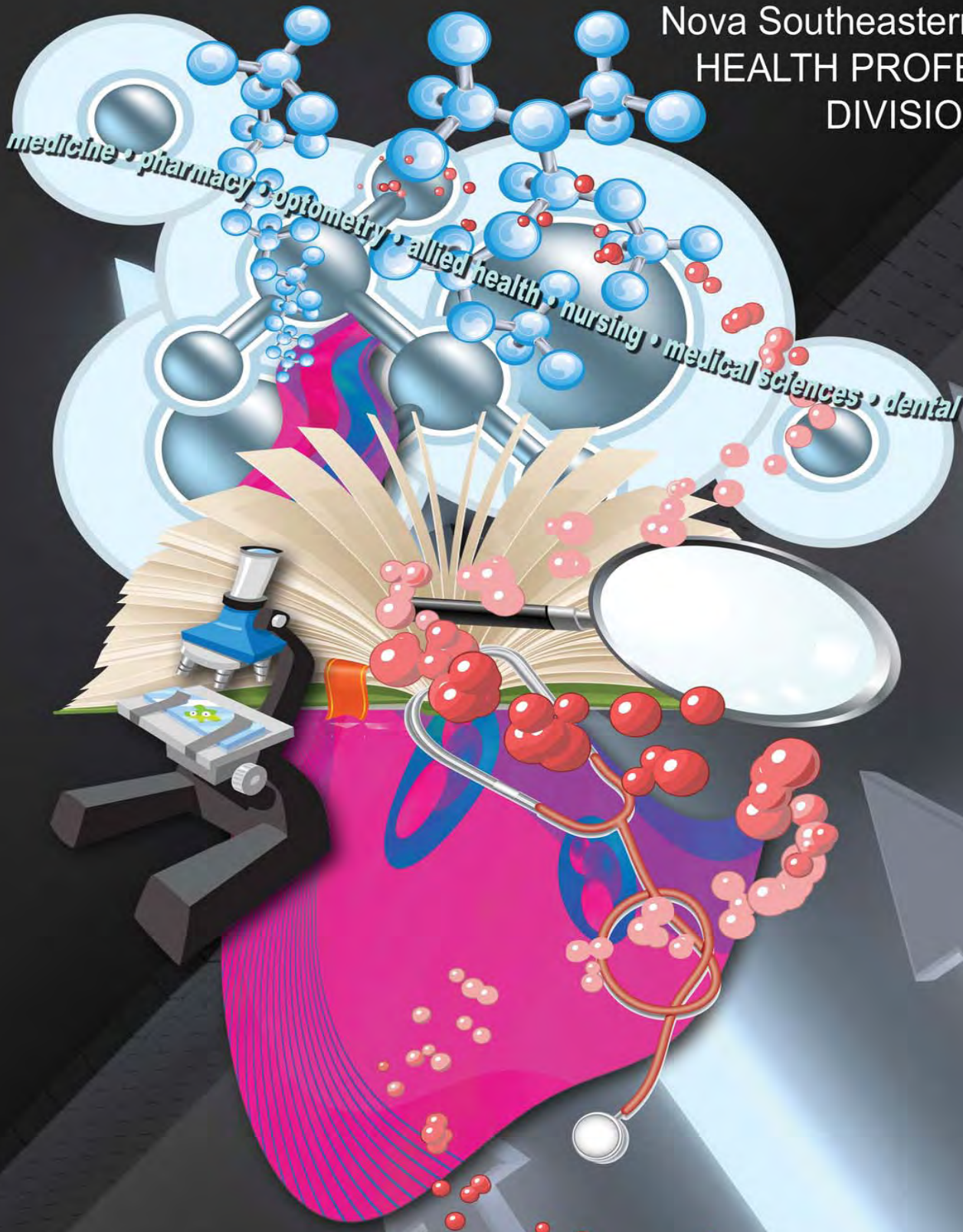


Nova Southeastern University
HEALTH PROFESSIONS
DIVISION



HPD RESEARCH DAY

Inaugural Event
April 25, 2008
Signature Grand, Davie, Florida

Welcome to HPD Research Day

April 25, 2008

The Health Professions Research Division is excited to welcome you to the inaugural Nova Southeastern University's Health Professions Division Research Day (HPD Research Day). All six academic colleges of the Health Professions Division--Allied Health and Nursing, Biomedical Science, Dental Medicine, Optometry, Osteopathic Medicine, and Pharmacy--have banded together to offer poster displays and oral presentations of their current cutting-edge research. In addition to the platform and poster presentations, we have invited Dr. Robert Bell and Dr. Ron Hays, two world renowned researchers, to give keynote addresses. NSU is truly honored that they will be addressing us.

Adding to the festivities will be door prizes and exhibitors from across South Florida. This event promises to be more than a day-long celebration of research and scholarly activities. It is also an opportunity for students and faculty from multiple disciplines to interact with each other and with the larger research community. Congratulations on being part of this premier, student-participated academic research event.

Patrick C. Hardigan, Ph.D.
Director HPD Research



Message from the Chancellor

Today is indeed a proud day for Nova Southeastern University's Health Professions Division (NSU-HPD) because it marks an important milestone in our continuing evolution as a collaborative multidisciplinary and clinical research venue.

Thanks to the proactive nature of Dr. Patrick Hardigan, who chairs the HPD Research Committee, the committee agreed it would be an excellent opportunity to create a showcase for student and faculty involvement in what NSU traditionally calls scholarly activity, much of which is actually research. Interestingly, many people view research as working in a laboratory and using test tubes and specialty equipment when the fact is research extends far beyond that restrictive definition. For example, we do some of the finest statistical and clinical research that can be found in the state of Florida. However, it's not done in a laboratory; it's done using research methodology and statistical knowledge and analysis.

Before I continue, I would like to thank and acknowledge the HPD Research Day Committee members who have been working so diligently to ensure the project's success. They are: Jodie Berman, Dr. Guy Nehrenz, Dr. Clark Galin, Dr. Sergio Kuttler, Dr. Franklin Garcia-Godoy, Dr. Harold Laubach, Dr. Scott Gorman, Dr. Joseph Pizzimenti, David Gensure, Dr. Leonard Levy, Dr. Gabriel Suci, Mislady Velez, Dr. Luigi Cubeddu, and Dr. John Baldwin.

The creation of Research Day will allow our talented students to be present at one place at the same time so they can participate in and view various poster presentations as well as attend multiple discussion groups. This project has proven to be a truly time-consuming undertaking, so I commend the wonderful commitment of our deans and various program leaders who have allowed us to move forward with this multidisciplinary interchange in the area of research and scholarly activity.

Although it's impossible to predict the outcomes that will be realized in the weeks and months following Research Day, I have no doubt our students will be vastly enriched by the experience. I believe they will come away with a realization of the importance of research in the formative accumulation of knowledge one goes through regardless of what HPD program they're participating in here at NSU.

I'm proud to say we've come a long way in a relatively short period of time. We now have multiple numbers of well-known and respected academic researchers in our institution that encompass the health professions spectrum. When Southeastern University of the Health Sciences merged with Nova University in 1994, we only had about \$400,000 in externally funded research. Today, the Health Professions Division is near the \$22 million mark, while the university is approaching \$50 million.

Now that we've demonstrated our capabilities and showcased our acumen and research prowess, it's become apparent that we're viewed from a more-esteemed perspective than ever before. Thanks to events such as Research Day, the sky's the limit for the NSU Health Professions Division.

Sincerely,



Fred Lippman, R.Ph., Ed.D.
Chancellor, Health Professions Division



Ron Hays, Ph.D.

Ron Hays (PhD, University of California, Riverside, Psychology) is Professor of Medicine at UCLA and a Senior Health Scientist at RAND. Dr. Hays has contributed to the development of research instruments to assess patient evaluations of health care, health-related quality of life, and other health outcomes. He has used these tools to assess individuals with diverse medical disorders and identify determinants of patient outcomes of health care. He has also studied adherence to medical regimens and other issues at the nexus of health, behavior, and the health care system. He is one of the Principal Investigators for CAHPS[®], a project that has developed measures to assess consumer evaluations of hospitals, nursing homes, group practices, and individual physicians as well as tools to report these assessments to health care providers and consumers, including consumers with specific medical problems (e.g., mobility impairments). Dr. Hays has published over 350 research articles and 31 book chapters. He is the editor-in-chief of *Quality of Life Research* and former deputy editor of *Medical Care*.



Robert Bell, Ph.D.

Robert G. Bell, Ph.D. is President / Owner of Drug and Biotechnology Development LLC, a consultancy to the international pharmaceutical industry and academia for biological, drug and device development. Dr. Bell received his B.S. in Chemistry, M.S. in Food Science and Human Nutrition and Ph.D. in Pharmaceutics from the University of Florida. His employment history includes Carter-Wallace, Inc., AL Pharma, UDL Laboratories, Inc., Somerset Pharmaceuticals, Inc. and Barr Laboratories, Inc. Bell is an Adjunct Professor Pharmaceutics, a member of the National Advisory Board and recipient of the Distinguished Alumnus Award at the College of Commonwealth University. Bell has published and presented extensively, and has been issued several patents. Research interests include pharmaceutical, clinical and biomedical analysis, CMC, quality, vaccines, follow-on proteins/biologics, women's health and oncology therapeutics. Bell has served in various leadership capacities within the American Association of Pharmaceutical Scientists (AAPS) including Chair of the Analysis and Pharmaceutical Quality (APQ) section, Editorial Advisory Board for the Journal of Pharmaceutical and Biomedical Analysis, 2006 National Biotechnology Conference Chair, Member-At-Large and 2010 Chair of the Americas for the joint AAPS / Pharmaceutical Sciences World Congress. Bell is also a member of the American Society of Clinical Oncology, American Urology Association, International Society of Andrology, American Chemical Society, American College of Pharmacology and Expert Member, Board of Pharmaceutical Sciences, International Pharmaceutical Federation. Bell participates in the Visiting Scientist Program to universities, colleges and high schools.



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PLATFORM PRESENTATIONS

COLLEGE OF ALLIED HEALTH AND NURSING

Sensory Stimulation Augments the Effects of Massed Practice Training in Individuals with Tetraplegia *In press Arch Phys Med Rehabil*

Kristina Beekhuizen¹, Ph.D., PT, Assistant Professor,
Edelle Field-Fote², Ph.D., PT, Professor

¹College of Allied Health and Nursing, and Miami VA Medical Center, Research Scientist; ²University of Miami

Objective. To compare functional changes and cortical neuroplasticity associated with upper extremity use following massed practice training and somatosensory stimulation in persons with incomplete tetraplegia. **Background.** Impaired hand function severely limits the ability of individuals with tetraplegia to perform manual activities of daily living. Massed practice and somatosensory stimulation are two interventions that may be able to maximize transmission of information through the intact connections in the spinal cord. **Methods.** Twenty-four subjects with chronic incomplete tetraplegia were randomly assigned to one of four groups: massed practice combined with somatosensory stimulation (MP+SS), somatosensory stimulation alone (SS), massed practice alone (MP), and no intervention. Intervention sessions were 2-hours/session, 5-days/week for 3 weeks. Massed practice consisted of repetitive practice of upper extremity functional tasks. Somatosensory stimulation consisted of median nerve stimulation at sub-motor threshold. Outcome measures assessed changes in upper extremity function, pinch grip strength, sensory function, and changes in cortical excitation. **Results.** Following training, compared to the Control group all groups showed significant improvements in hand function. The MP+SS and SS groups demonstrated significant improvements in upper extremity function and pinch strength compared to the Control group. Only the MP+SS demonstrated a significant change in sensory scores compared to the Control group. The MP+SS and MP groups demonstrated greater change in threshold measures of cortical excitability. **Conclusions.** Individuals with incomplete tetraplegia obtain functional benefits from massed practice of task-oriented skills. Somatosensory stimulation appear to be a valuable adjunct to training programs designed to improve hand and upper extremity function in these individuals. **Grants.** This work was supported in part by the Miami Project to Cure Paralysis at the University of Miami Medical School and the Center of Excellence for Functional Recovery in Chronic SCI at the Miami VAMC.

Tinnitus- Latest Thinking

Paul B. Davis, Ph.D., Associate Professor

The most common form of tinnitus is a mildly annoying perception of a 'ringing in the ears', but it can take many other forms. It typically co-exists with hearing loss and decreased sound tolerance. Its severity can range from very slight to completely debilitating, leading to suicidal ideation. Until recently its origins were obscure and patients were typically told 'there's nothing that can be done for it so you'll just have to learn to live with it'. In the past decade or so, science's understanding of this disorder has improved enormously, so these findings will be briefly outlined. Treatment options have also increased dramatically, so these too will be summarized. Some useful clinical tips will be given to help Health Professionals assist patients suffering from this condition.

Shoulder Joint and Muscle Characteristics in the Recreational Weight Training Population

Morey J. Kolber, PT, Ph.D., Assistant Professor,
Kristina Beekhuizen, PT, Ph.D., Assistant Professor
M. Samuel Cheng, PT, ScD, Assistant Professor,
Madeleine A. Hellman, PT, Ed.D, MHM, Associate Professor

Objective. The purpose of this study was to investigate shoulder joint and muscle characteristics in the recreational weight-training (RWT) population to determine specific risk-related adaptations that may occur from participation. **Background.** Shoulder disorders attributed to weight-training are well documented in the literature; however, a paucity of evidence-based research exists to describe risk factors inherent to participation. **Methods.** Ninety male participants ages 19-47 (mean age 28.9), including 60 individuals who participated in upper extremity RWT and 30 controls with no record of RWT participation were recruited. Active range of motion (AROM), posterior shoulder tightness (PST), adjusted strength values and strength ratios were compared between the RWT participants and control group. **Results.** Significant mobility differences were present ($p < .001$) between the groups. RWT participants had decreased mobility when compared to the control group for all AROM measurements with the exception of external rotation which was greater. Strength ratios were significantly greater in the RWT group ($p \leq .001$) implying agonist/antagonist muscle imbalances. **Conclusion.** RWT participants are predisposed to strength and mobility imbalances as a result of training. The imbalances identified have been associated with shoulder disorders in the general and athletic population, thus may place RWT participants at risk for injury. Exercise selection that mitigates strength and mobility imbalances may serve to prevent injury in this population. Clinicians and strength and conditioning professionals should consider the biomechanical stresses and adaptations associated with RWT when prescribing upper extremity exercises.

The Effect of Endurance Training on People with Multiple Sclerosis: A Case Report

Bini Litwin, Ph.D., MBA, PT, Associate Professor
Matthew Brandt, SPT, Student Physical Therapist

Purpose. The purpose of this case report is to assess clinical outcomes of an 8-week endurance training program in two patients with multiple sclerosis. **Methods.** An endurance training program was implemented with two patients diagnosed with multiple sclerosis (MS). Patient A scored 0 on the expanded disability scale (EDSS) and Patient B scored 5 on the EDSS. Each patient was assessed using the 6 minute walk test (MWT), the SF-36 Health Status Profile, and the Modified Fatigue Impact Scale (MFIS). Each patient was cleared for low impact endurance exercise by their respective physician. The endurance training program consisted of: a) In-clinic treadmill walking for patient A and level surface walking program for patient one to two times/week b) A metronome monitored self-paced home walking program one to two times/week and c) instruction in breathing strategies (pursed-lip breathing), self monitoring via rate to perceived exertion (RPE) and energy conservation techniques to be used as needed. Patients kept a diary of activities performed, noting response (RPE) and compliance. **Results.** After the 8-week training program, both patients showed an increase in endurance, as measured by the 6MWT, reduced fatigue measured by the 6MWT & MFIS, and increased Quality of Life (QoL) measured by the SF-36. **Conclusions.** Outcomes suggest that an endurance training program can be effective in improving endurance, QoL and decreasing fatigue in high functioning multiple sclerosis patients. Further studies should be directed towards assessing outcomes in larger populations and those with an EDSS level greater than 5.

Comparing Physician Assistant Students' Myers-Briggs Type Indicator Personality Types/Learning Styles

John Rafalko, Ed.D., PA-C, Associate Professor

Background. Professor and student awareness of learning styles reflected through personality types enable educators to better meet students' needs. **Purpose:** To compare and self-verify student personality types and learning styles for differences as measured by the Myers-Briggs Type Indicator (MBTI) and the Success Types Learning Style Type Indicator (STLSTI) in the Physician Assistant Program, as well as differences when MBTI results are compared to past students. **Methodology.** A self-selected, nonrandomized methodology was used to answer 5 research questions. Eighty-seven current students participated while 452 past students were reviewed retrospectively. **Results.** χ^2 values used to answer research questions 1-4 were statistically significant ($p < 0.05$). The STLSTI concurrent validity was supported when it matched the MBTI on 3 of 4 dichotomous scale variables excluding judgment and perceiving ($p < 0.05$). ESTJ and ISTJ personality types predominated, as did the paired attitudes or functions for ST, SJ, TJ, and ES. Research Question 5 failed to reject the null hypothesis that indicated poor agreement. **Conclusions.** Differences exist in Class of 2008 student personality types and learning styles as measured by the MBTI and STLSTI, and when compared to past students. There are no differences when individually self-verifying personality type and learning style (STLSTI and MBTI). Metacognition uniting both teachers and students mutually based on personality types, learning styles, and teaching styles needs to be acknowledged as part of the new medical education curricula.

Student Models Improve College-level Science Writing

Sarah Ransdell, Ph.D., Associate Professor
Tymar Goudey, MOT, OT
Carrie Keck, MOT, OT

Background. Recent writing research has yielded new interventions for improving college-level composition, but less has been done regarding the high-level reading, reasoning, and writing necessary for research report writing. **Methods.** In the present research, this writing takes the form of annotated bibliographies based on primary source material. The current research provides three conditions of instruction in a fixed order within-subjects design, first, a writing thesis and support scoring guide, second, an instructor-commented student model, and third, both the scoring guide and the student model. The scoring guide is based on traditional methods that include detailed grading rubrics and focuses the student on the final grade. The student model is based on observational learning and focuses the student on revision. **Results.** Students were found to write better assignments when asked to focus on revision processes rather than grades. A process approach explains how writing proceeds from planning, to sentence generation processes, to revision in recursive cycles. **Conclusions.** Advanced college students still have difficulty writing science reports and can benefit from reminders to focus on how to revise and to do it often. Students with higher reading comprehension and health science reasoning scores have higher quality writing samples under all three instructional conditions, but especially in the process approach. For these students, even a one-shot, single instruction period following a process approach yielded better quality writing than a product approach. Higher reasoning and reading comprehension skill may afford better strategic control over product and process strategy use since these variables predicted reliable variance in quality. **Grants.** The authors would like to thank the NSU College of Allied Health and Nursing and the PFRDG award program for support of this research.

Valuation, Mission and Money: A Case Study, 1916 - 1994

Marcella M. Rutherford, Ph.D., Assistant Professor

Objective. This historical case study examined how the Daughters of Charity in Jacksonville, Florida, succeeded in demonstrating their value to the people in Jacksonville Florida and were able to obtain the funding needed to care for the community. **Background.** The research explores how the Daughters succeeded as health care leaders, nurses, administrators, owners, and providers for over ninety years of healthcare changes at St. Vincent's Health System. These Sisters trained in finance and nursing, were able to obtain payment for services and gain control over practice. Valuation is an approach that encourages a company to document the financial value of both the tangible and intangible assets associated with the services provided. Valuation studies related to nursing are challenged by the need to include the complexity of patient services that cause variation in research results. **Method.** The archives at St. Vincent's Health System in Jacksonville, Florida provided the primary and secondary sources for this historical case study and provided the financial, administrative, and management records from 1910 to the early 1990s. **Results.** The research showed that the community trusted and valued these women and their mission. In addition, the Sisters succeeded because of their knowledge as nurses and as health care business women. **Conclusion.** The research findings affirmed the importance of preserving nursing's reputation as a trusted provider. In addition, to prepare today's nurses for the health care environment, the study demonstrated the importance of including knowledge related to the business aspects of health care in core nursing educational preparation.

Rumination, Activity Participation and Subjective Well-being in Persons with Depression

Chinyu Wu, Ph.D., OTR, Associate Professor

Objective. The purpose of the study was to investigate the effects of rumination on activity participation and subjective well-being in persons with depression. **Background.** Rumination is a commonly observed and widely documented clinical problem in persons with depression. Those with rumination respond to their illness with repetitive and passive thinking toward the symptoms and their possible causes and consequences. Although existing literature has addressed relationships between rumination and subjective well-being, little is known about real life problems caused by rumination. **Methods.** This study used a cross-sectional design. It was carried out at multiple hospitals in Taiwan. Data were collected at psychiatric outpatient and community facilities. Data were collected on 143 participants, mostly female (73%) with an average age of 43 and the majority diagnoses of major depression (49%) and bipolar II affective disorder (20%). The instruments used included the Beck Depression Inventory-II (BDI-II), Ruminative Response Scale (RRS), the Brief World Health Organization-Quality of Life (WHOQOL-BRIEF) Assessment- Taiwan version, and Activity Participation and Restriction Questionnaire (APRQ). **Results.** Results of path analysis revealed that rumination imposed significant impact on depression, activity participation, and quality of life. While quality of life had negative correlations with depression, there was no significant correlation between activity participation and depression (Chi-square= 329.14, Goodness-of-fit: 0.63265, RMSEA: 0.24203, Bentler-Bonnett NFI = 0.51207, Bentler CFI = 0.5317, BIC = 139.91). **Conclusion.** Although the preliminary path analysis yielded a statistically significant model, the conceptual framework is under refinement at the moment. Tentative model with theoretical and clinical implications will be presented at the Research Day.

COLLEGE OF DENTAL MEDICINE

Department of Endodontics

Effectiveness of Six Different Endodontic Treatments to Remove Smear Layer

Sonia Chopra, DDS, 2nd year Postgraduate,
Peter E. Murray, Ph.D., Associate Professor,
Kenneth N. Namerow, DDS, Associate Professor

Objective. The objective of this study was to compare the effectiveness of six different endodontic treatments to remove the smear layer from the root canals of teeth. **Background.** The ultrasonic activation (UA) of endodontic files and use of ethylenediaminetetraacetic acid (EDTA) may help to remove the smear layer, but this is controversial and requires investigation. **Methods.** In order to create a smear layer, 60 human single rooted teeth were prepared with rotary instruments to an apical preparation size of 45/06. The teeth were then divided into six groups (A-F) of ten teeth each based on their final flush: A) EDTA with F file UA and 6% Sodium hypochlorite (NaOCl). B) NaOCl with F file UA. C) Same as group A, but with #20K file UA. D) Same as group B, but with #20K file UA. E) EDTA and NaOCl were delivered with a syringe. F) Saline delivered with a syringe as the negative control. The teeth were processed for scanning electron microscopy to visualize the smear layer removal. Data were analyzed using Chi-square statistical tests at a significance of 95%. **Results.** We found that the most effective treatment to remove smear layer was the use of EDTA chelating agent ($p < 0.0001$). The treatments which used ultrasonic activation did not have less smear layer compared to the other treatment groups ($p > 0.05$). **Conclusion.** The ultrasonic activation of endodontic files is not effective in the absence of EDTA to remove the smear layer from root canal surfaces. **Grants.** This research was sponsored by NSU-HPD.

Comparison of Two Rotary Instruments to Preserve Root Canal Morphology

Maziyar Ebrahimi DMD, 2nd year Postgraduate,
Sergio Kuttler BS, DDS, Associate Professor,
Adam Lloyd BDS, MS, Assistant Professor,
Peter E. Murray, Ph.D., Associate Professor,
Kenneth N. Namerow DDS, Associate Professor

Background. Proper cleaning and shaping of root canal systems cannot be determined by post operative radiographs of root filled teeth as radiographs are two dimensional images of three dimensional objects. There are currently two methods in which canal morphology of teeth can be studied before and after instrumentation; Cube Methodology and the use of the CT scan. The Cube Methodology was used in this study. **Objective.** To compare the ability of two rotary instruments to preserve the morphology of the root canals of human molar teeth. **Methods.** A pre-existing collection of extracted human first and second molar teeth ($n = 25$) radiographically demonstrating a Vertucci type IV canal configuration with two separate canals from orifice to foramen were used. The teeth were embedded in composite resin using the endodontic cube as a mold (Kuttler et al., JOE 2001;27:533-6). Each of the embedded teeth was cut into transverse slices. The slices were re-assembled into complete teeth using the endodontic cube. In each tooth, one root canal was cleaned and shaped using the 06 ProFile (Dentsply, Maillefer, Ballaigues, Switzerland), and the other canal with the K3 g-pack (SybronEndo, West Collins, CA) rotary instruments according to manufacturers' guidelines, with all groups being prepared to size 25 and then to 40 apical file. The working lengths for each canal were determined 1mm short of the apex using a #15 file. The tooth slices were digitally scanned before and after preparation, and image analysis software was used to assess changes in the morphology of the root canals. The data was analyzed by ANOVA and Scheffe post-hoc statistical tests (p values) at a significance of 95%. **Results.** The use of different files created different deviations of the center-line of the root canal ($p = 0.0001$) and different root canal areas ($p = 0.000$). The ProFile 25 06, 40 06 and the K3 equivalents cut very similar root canal centerlines ($p < 0.05$). The area of root instrumentation was lower with the Profile 25 06 compared to the K3 25 06 ($p = 0.0004$), while both the Profile 40 06 and K3 40 06 area were similar ($p = 0.3389$). These results suggest ProFile 25 06 instruments are better at retaining the morphology of molar root canals than the K3 25 06 instruments, but the larger files have the same effects. **Conclusion.** The K3 and ProFile 25 06, 40 06 files

were able to maintain the original root-canal morphology. The ProFile 25/06 removed less dentin tooth structure than the K3 25/06. The K3 25/06 and 40/06 files removed a similar amount of dentin tooth structure. This could be due because the K3 file system has coronal files of different taper sizes; .12, .10 and 0.8.

Investigation of Tissue-Engineered Constructs for Regenerative Endodontic Therapy.

Matthew W. Gebhardt, DDS, 2nd year Postgraduate,
Peter E. Murray, Ph.D., Associate Professor,
Kenneth N. Namerow, DDS, Associate Professor,
Sergio Kuttler, DDS, Associate Professor,
F. Garcia-Godoy, DDS, Professor

Objective. The objective of this research was to conduct a histological analysis of tissue-engineered pulp constructs. **Background.** Stem cells from human exfoliated deciduous teeth (SHED) and periodontal stem cells (PSC) were grown to confluence and seeded on 3-dimensional tissue engineering scaffolds. **Methods.** The pulp tissue constructs (n=216) were created by seeding SHED or PSC on three types of scaffolds (BD Biosciences, Franklin Lakes, NJ); a synthetic open-cell D,D-L,L-poly(lactic acid) (OPLA) scaffold, a bovine collagen scaffold (BCS), and a calcium phosphate bioceramic (CPB) scaffold. The negative control was an absence of treatment. The constructs were submerged in Dulbecco's Minimal Essential Media containing 10% fetal calf serum and antibiotics, maintained at 37 C in a 5% CO-2 atmosphere for 1-14 days. Neutral red dye (0.0016%) was added to the culture media to stain metabolically active cells. The specimens were fixed in formalin, dehydrated and processed for histology according to ISO criteria. A light microscope at x200 magnification was used to visualize cells within the dental pulp constructs. Data was analyzed by Chi-square statistical tests (p values) at a significance of 95%. **Results.** SHED and PSC survival was optimal in the OPLA and BCS pulp constructs, but not the CPB pulp constructs ($p < 0.05$) especially over longer time periods ($p < 0.05$). **Conclusion.** These in vitro results suggest that the OPLA or BCS tissue-engineered pulp constructs have the potential to be used as part of future regenerative endodontic therapy. **Grants.** This study was supported by the AAEF and NSU.

Comparison between a novel nickel-titanium alloy and 508 Nitinol on cyclic fatigue life of ProFile 25/.04 rotary instruments

Eugenia Johnson, DDS, 2nd year Postgraduate,
Adam Lloyd, BDS, MS, Assistant Professor,
Sergio Kuttler, DDS, BS, Associate Professor,
Kenneth Namerow, DDS, Associate Professor

Objective. To test the cyclic fatigue resistance of nickel-titanium rotary files produced from 508 Nitinol and M-Wire™ NiTi alloys. **Background.** Endodontic files must resist breakage, and this is measured as cyclic fatigue. **Methods.** Thirty ProFile® 25/.04 instruments were manufactured from one of three variants of 508 Nitinol that were subjected to different thermo-mechanical processing. Controls (n = 30 each) consisted of stock 508 Nitinol 25/.04, as well as 25/.02 and 25/.06 instruments. Investigation of the cyclic fatigue was performed by rotating instruments at 300 RPM in a simulated steel root canal with a 90° curve of 5 mm radius until separation occurred. The number of rotations to failure was calculated. Torsion testing at failure was also undertaken by clamping 3 mm of the tip of each instrument between brass plates and rotating it at 2 RPM until failure. Data were recorded for torque and angle at fracture of thirty instruments per group. **Results.** Cyclic fatigue of different alloys was analyzed using Welch's ANOVA. Dunnett's T3 test was used for all pair-wise comparisons. Statistical differences were found with an M-Wire™ NiTi variant nearly 400% more resistant to cyclic fatigue than stock 508 Nitinol ($p < .001$). Load to fracture was analyzed using an ANCOVA model, with Tukey's-HSD test applied to all pair-wise comparisons. Significant differences were found between all 508 Nitinol groups and M-Wire™ NiTi ($p < 0.001$). **Conclusion.** ProFile 25/.04 files manufactured from M-Wire NiTi have significantly greater resistance to cyclic fatigue while maintaining comparable torsional properties.

A Comparison of Files and Solvents to Remove Endodontic Materials

Jamie D. Ring, DMD, 2nd year Postgraduate,
B. Ivan Moldauer, DMD, Assistant Professor,
Peter E. Murray, Ph.D., Associate Professor,
Kenneth N. Namerow, DDS, Associate Professor

Objective. The objective of this study was to compare the effectiveness of two file systems with two solvents for the removal of endodontic obturation materials from teeth. **Background.** Gutta percha and RealSeal are two common endodontic obturation materials that must be removed to retreat teeth, however, the effectiveness of file systems and solvents to remove these materials is controversial. **Methods.** Human extracted teeth (n = 80) were instrumented and obturated with either Gutta-percha/ AH Plus cement (Dentsply DeTrey, Konstanz, Germany) or RealSeal (SybronEndo, Orange, CA) bonded obturation material according to manufacturer instructions. Each tooth was retreated using either one of two rotary instrumentation file systems: Protaper Retreatment Files (Dentsply, Tulsa, OK) or EndoSequence Files (Brasseler, Savannah, GA). Each of the file systems was tested using Chloroform Solvent or Orange Solvent retreatment agents. The teeth were processed for scanning electron microscopy and micrographs were categorized using a double blind scale for obturation material removal at 2000x magnification. Data was analyzed by Chi-square at a significance of 95%. **Results.** We found that Chloroform and Agent Orange are equally effective solvents to remove the obturation materials from the root canals of teeth ($p > 0.05$). Both the Protaper Retreatment and EndoSequence file systems were also similarly effective ($p > 0.05$). **Conclusion.** The use of the retreatment solvents: Chloroform and Agent Orange, and the Brassler Sequence and ProTaper files are equally effective to remove Gutta percha and RealSeal obturation materials from the root canals of teeth. **Grants.** This research was sponsored by the NSU Health Professions Division.

Endodontic Irrigation and Cell Adherence to Root Canal Dentin

Karla Ring, DMD, 2nd year Postgraduate,
Peter E. Murray, Ph.D., Associate Professor,
Kenneth N. Namerow, DDS, Associate Professor,
Sergio Kuttler, DDS, Associate Professor,
Franklin Garcia-Godoy, DDS, Professor

Objective. The objective of this study was to measure and compare the effect of nine different endodontic irrigation and chelating treatments on dental pulp stem cell (DPSC) attachment to root canal surfaces. **Background.** It is not known how the use of irrigating solutions and chelating agents can affect DPSC adherence to the disinfected root canal surfaces when used to accomplish regenerative endodontic therapy. **Methods.** Thirty-eight extracted human non-diseased single-canal teeth were cleaned and shaped using ProTaper and ProFile rotary instrumentation in a crown-down manner to a F3 and Profile 40/06 (Dentsply Endodontics-Tulsa Dental, Tulsa, OK). The irrigation treatments investigated were: 6% Sodium hypochlorite [NaOCl] (Clorox, Oakland, CA), 2% Chlorhexidine gluconate [CHX] (Vista Dental Products, Racine, WI), Aquatine Endodontic Cleanser [AEC] (Sterilox Dental, Malvern, PA), and Morinda Citrifolia [MC] (Tahitian Noni International, Provo, UT). The irrigation treatments were used in conjunction with EDTA or MTAD (Dentsply Endodontics-Tulsa Dental, Tulsa, OK). The instrumented teeth were immediately placed in cell culture with confluent DPSCs for one week. Data was collected using scanning electron microscopy and analyzed by Chi-square statistical tests (p values). **Results.** We found that the use of chelating agents and the most biocompatible irrigants; AEC and MC were more successful at promoting DPSC survival and attachment to root canal surfaces compared to CHX and NaOCl ($p < 0.0001$). **Conclusion.** The results from this study suggest that biocompatible irrigants and chelating agents are needed to promote DPSC attachment to root canal surfaces. **Grants.** This research was sponsored by the AAEF and NSU.

Department of Orthodontics

Diode Laser Debonding of Ceramic Brackets

Paul J. Feldon, DDS, 2nd year Postgraduate

Objective. To investigate the effectiveness of debonding ceramic brackets with a diode laser. **Background.** Debonding ceramic brackets safely and efficiently has been a challenge facing clinicians since their inception. Numerous debonding methods have been investigated and used clinically, each having their disadvantages and advantages. One of these methods involves using lasers. Several types of lasers have been tested and used for this purpose. **Methods.** Two types of ceramic brackets (monocrystalline and polycrystalline) were bonded to bovine maxillary central incisors. The diode laser was applied to brackets in the experimental groups for 3 seconds. Shear bond strength (SBS) and thermal effects on the pulp chamber were assessed at 2 laser energy levels; 2 and 3 Watts per cm^2 . ANOVA was used to determine significant differences in SBS. **Results.** Diode laser was ineffective with polycrystalline brackets and effective with monocrystalline brackets in significantly ($p < 0.05$) lowering the SBS. There were no significant ARI score differences between any of the groups tested. **Conclusions.** Diode laser use significantly decreased the debonding force required for monocrystalline brackets without increasing the pulp chamber temperature significantly. Diode laser use did not significantly decrease the debonding force required for polycrystalline brackets.

Torticocephaly; A Distinct Clinical Entity from Primary Positional Plagiocephaly?

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Background. Nonsynostotic deformational plagiocephaly and primary congenital muscular torticollis are two abnormalities increasingly being diagnosed in America today. Currently, there are no distinctive measurements to differentiate these two abnormalities. **Objective.** To determine whether anthropomorphic measurements distinguish positional plagiocephaly associated with torticollis from primary positional plagiocephaly. **Methods.** A retrospective chart review of more than 30 patients with positional plagiocephaly was performed. Seventeen patients had a confirmed diagnosis of torticollis associated with positional plagiocephaly, and 16 patients had positional plagiocephaly without any associated torticollis. All of the patients underwent cranial surface scanning with Starscanner software upon initial consultation before any intervention. The anthropomorphic measurements obtained included; head circumference, cranial breadth and length, cephalic ratio, radial symmetry index, cranial quadrant volumes, and ratios of cranial quadrant volumes. We compared these measurements between the two groups of patients; primary positional plagiocephaly and positional plagiocephaly with torticollis (torticocephaly) using two sample t-tests to determine statistical significance. **Results.** Results involving head circumference, cephalic ratio, cranial length, cranial breadth, the radial symmetry index, cranial quadrant volumes, and ratio of quadrant volumes are pending. **Conclusions.** The anthropomorphic measurements, radial symmetry ratio and cranial quadrant volumes define a distinct clinical entity in the positional plagiocephaly associated with torticollis; torticocephaly. Torticocephaly demonstrates a greater degree of cranial asymmetry when compared to primary positional plagiocephaly.

Maxillary Asymmetry with Rapid Palatal Expansion

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Background. Numerous orthodontists have observed clinically that during rapid palatal expansion there is asymmetric expansion of the maxilla and the maxillary dentition. Studies have shown that after treatment with RPE, the amount of expansion follows a triangular pattern, with the greatest increase in the maxillary arch width, followed by the nasal width, ending at the frontonasal suture. No studies address the possibility of asymmetry in the expansion. **Objective.** To investigate

whether there is asymmetric expansion of the maxilla after treatment with rapid palatal expander. **Methods.** The records of twenty-six patients who had been treated with Hyrax rapid palatal expanders were included in this study. Pre- (T1) and post-RPE (T2) posteroanterior cephalograms were traced. On each radiograph, four transverse angular and linear measurements were made per side, drawn away from a midline that extended through Crista galli (Cg) and the midpoint between both Foramen rotundums (Fr). Changes from T1 to T2 on the right side were compared to those on the left side. Also, pre-treatment dental crossbites, airway size, and deviations in the nasal septum were identified to test for correlation with the asymmetric expansion. **Results.** Significant differences were found between the right and left Lateral nasal wall – Mid Sagittal Reference linear measurements and between the right and left Jugum – Mid Sagittal Reference linear measurements between the pre and post expansion groups ($p < .05$). Gender was found statistically significant (male/female) ($p < .05$). No other variable was statistically significant. **Conclusion.** There is asymmetric expansion of the maxilla after treatment with rapid palatal expander.

Pediatric Dentistry

Sealing Partially Erupted First Molars: Six Months Clinical Study Results

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Objective. To determine the clinical benefit of Glass Ionomer based sealants. **Background.** Glass Ionomer based sealant will show the highest degree of retention due to its potential to bond to saliva-contaminated enamel. **Objective.** To test the hypothesis that glass-ionomers can provide effective protection on partially-erupted first molars compared to resin-based systems on saliva-contaminated enamel. **Methods.** Thirty-nine high-carries risk patients 5-9 years old, who met inclusion criteria, were recruited following IRB approval. Two first permanent partially-erupted molars with a Diagnodent score below 20 were selected for this split-mouth study. The groups of treatment included: GC Fuji Triage, glass-ionomer (T), and Delton FS+, resin-based sealant (D) using the manufacturer's directions. Cotton-roll isolation was used. Sealants were placed in a random selection by a calibrated operator. Sealants covered the occlusal surface, including under the operculum. Intraoral pictures (Gendex) of the teeth were taken before placing sealants, immediately after placement, and at 6-month recall by another blinded-calibrated operator, and analyzed to evaluate retention and microleakage. **Results.** Thirty-four children were present for the 6-month recall (87% recall-rate). No statistical differences were found between the groups for microleakage and retention. Differences were found between baseline and 6-months ($p < .01$). Microleakage was assessed by total-microleakage (ML), partial-microleakage (PM), no-microleakage (NM). Retention was assessed by full-retention (F), partial-retention (PR) lost (L). **Conclusions.** Even though the retention and microleakage rate appeared to be similar for Groups T and D, T has advantages due to its fluoride release and easier technique.

Periodontology

Textured Coronal Grooves and Their Effect on Marginal Bone Height and Gingival Contour in Humans

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Objective. This study compared marginal bone height and gingival contour around implants with textured coronal grooves (TCGs) versus implants with a polished collar without TCGs. **Background.** Recently implants featuring TCGs near their implant-abutment interface have been investigated in animals and have shown enhanced bone stability. The effect of this enhanced stability on humans is not clear. Controversy exists as to whether TCGs maintain improved marginal bone height, or if they provide superior gingival contour, compared to other implant designs. **Methods.** Sixteen patients received immediately provisionalized tapered implants. Eight received implants with TCGs (test) while the other eight received implants with a 0.5mm polished collar (control). 22 total implants were investigated and followed for one year. Patients were evaluated clinically and with standardized radiographs at three, six and twelve months. Index evaluations of gingival contour along with measurements of the implant length and height of bone on both mesial and distal were obtained at each time point. **Results.** Descriptive statistics were used to compare the marginal bone height (from ratios of implant length versus bone height) and gingival contours surrounding both types of implants over time. Each group had an overall implant survival of 100%. Test and control implants provided equal esthetics up to twelve months. **Conclusion.** The findings from this investigation suggest that there is no difference in the marginal height of bone and healed gingival esthetics around implants designed with TCGs versus implants with a polished collar. **Grants.** This study was partially funded by a grant from Nobel Biocare.

Comparing the Perception of Periodontists, General Dentists, and Lay People to Inter-Dental Papilla Discrepancies: "The Black Triangle Disease"

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Objective. To determine the size of a “black triangle” perceived as unaesthetic to Periodontists, General Dentists and Lay People. **Background.** Dental implant rehabilitation is no longer merely a vehicle to restore lost masticatory and phonetic function. With advances in bone augmentation and soft tissue management patients have expect aesthetically pleasing restorative treatments and have questioned the disappearance of inter-dental papilla resulting in the so-called “black triangle disease.” **Methods.** A smile photograph was digitally altered with varying heights of inter-dental papilla deficiencies (“black triangles”). A total of 16 images were created. The black triangles ranged in height from 0 to 2mm in 0.25mm increments and were equally divided between the central and lateral papillae. Subjects from the three testing groups (20 Periodontists, 20 General Dentists and 20 Lay People) were presented with the images to determine the smallest papilla deficiency which was considered unaesthetic. **Results.** The mean size at which an unaesthetic black triangle was discernable ranged from 1.06mm to 0.45mm and varied depending upon the group. At the central papilla position papilla discrepancies were detected by Lay People at 1.06mm; General Dentists at 0.65mm; Periodontists at 0.55mm. Lateral papilla position: Lay People at 0.625mm; General Dentists at 0.575mm; Periodontists at 0.45mm. **Conclusion.** Periodontists were the most perceptive in detecting inter-dental deficiencies and were able to discern the smallest deficiencies, followed by General Dentists and finally Lay People. All groups were able to detect small discrepancies and discrepancies at the lateral papilla were more readily detected than at the central papilla.

Antimicrobial Effectiveness of Commonly Used Medicaments and Solutions to *Porphyromonas gingivalis* (Pg)

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Objective. The aim of this study is to evaluate the in vitro bacteriostatic properties of several commonly used dental medicaments and solutions against Pg. **Background.** Pg, a gram negative, anaerobic bacteria, is implicated in the development of several periodontal diseases including gingivitis, chronic periodontitis and aggressive periodontitis. Various medicaments are frequently utilized during the prevention, management and treatment of these periodontal diseases. **Methods.** Agar plates were seeded with *P. gingivalis* and incubated for 24 hours with 6mm diameter disks soaked with one of the following: chlorhexidine 0.12%, Listerine®, Cepacol®, and Crest® mouthwashes, amoxicillin, tetracycline, clindamycin, Emdogain® and EDTA 24%. Disks soaked in 6% sodium hypochlorite or saline solution served as controls. The diameters of the zones of *P. gingivalis* growth inhibition were measured with electronic calipers to determine the zones of microbial inhibition for each of the test solutions. **Results.** All the test products, except tetracycline and Emdogain® were effective at preventing *P. gingivalis* growth. There was a significant difference between the antimicrobial effectiveness of the different medicaments ranked as follows from greatest to least: EDTA > chlorhexidine > clindamycin® > Crest® > Cepacol® > Listerine® > amoxicillin. **Conclusion.** These findings suggest that Emdogain® and tetracycline have little or no effect on the growth of *P. gingivalis*. However, several medicaments commonly used in dentistry did have antibacterial effect against the putative periodontal pathogen *P. gingivails* in vitro. Notable was the marked inhibitory effect of EDTA which warrants further study.

The Detection of Increased Telomerase in Oral Exfoliative Cells – a Pilot Study

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Objective. This study was conducted to determine if certain markers of increased telomerase activity could be detected in oral brush biopsies of suspicious oral lesions. **Background.** Cancer of the oral cavity and oropharynx is a major contributor to cancer related deaths in the United States. It is estimated that each year 30,000 new cases of oral cancer will be diagnosed and 8,000 people will die from the disease. Telomeres are repetitive DNA sequences at the end of linear chromosomes which stabilize and protect DNA from degradation by intracellular enzymes. Telomerase is the enzyme responsible for maintenance of these chromosomal ends. Since with a few exceptions, telomerase activity is not detected in normal somatic cells, it is therefore considered to be a diagnostic marker for detecting malignancy. **Methods.** Two oral brush biopsies were obtained from 39 oral lesions using the OralCDX system. One specimen was used for cytologic analysis (control) and one underwent analysis for two subunits of telomerase, human telomerase RNA (hTR) and human telomerase reverse transcriptase (hTRT). For telomerase analysis cells were lysed, mRNA extracted, and RT-PCR was performed. PCR products were electrophoresed, and visualized by ethidium bromide for the presence of hTR and hTRT. **Results.** Of the 13 samples that were suitable for analysis, all 13 were positive hTR while only 1 was positive for hTRT. Oral cytology detected atypical cells in the sample which was positive for hTRT. **Conclusion.** This pilot study revealed that hTRT may be a useful marker of cellular atypia and warrants further studies.

Modification of Pulsed Laser Deposited Calcium Phosphate Biomaterials

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COLLEGE OF MEDICAL SCIENCES

Local Tissue Water Changes in Patients with Lower Extremity Lymphedema

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Objective. Our present goal was to determine this method's suitability for lower extremity assessments and to quantitate LTW changes associated with manual lymphatic therapy (MLD). **Background.** Previously we described the utility of measuring local tissue water (LTW) via tissue dielectric constant (TDC) measurements to assess postmastectomy lymphedema presence and extent (Lymphology 2007;40:87-94). **Methods.** LTW was estimated via TDC values measured to a 2.5 mm depth at the greatest leg swelling site before and after one MLD treatment in 27 legs of 18 lymphedema patients. Girth at these sites was measured with a calibrated tape measure. TDC values, which range from 1 for zero water to 78.5 for all water, were measured four times and averaged for LTW assessments. **Results.** In every case the post-treatment LTW was reduced from its pre-treatment value with percentage reductions ranging from -3.0% to -23.5% with an overall change (mean +/- SD) of -9.75 +/-5.64% ($p<0.0001$). Changes in girth were smaller, ranging from -5.26% to +0.91% with an overall change of -1.55 +/- 1.93% ($p<0.05$). **Conclusion.** Since TDC measurements reflect changes to a depth of about 2.5 mm whereas girth measurements reflect conditions of the entire cross-section, it is likely that the TDC assessment is more sensitive to smaller changes and to the immediate effects of MLD treatment. The substantial percentage change in LTW, but much smaller change in girth, are consistent with this and suggest that TDC measurements may be useful as complementary and perhaps independent assessment methods of edema/lymphedema and treatment-related changes.

Comparison of Selected Pathogenic and Environmental Strains of *Acanthamoeba*

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Objective. Because of a recent increase in the incidence of *Acanthamoeba* Keratitis, we studied the effect of temperature on the growth of 3 environmental strains (2 from tap water (TIV and MS26), one from a moist rock wall (BP)) along with 2 pathogenic corneal strains of *Acanthamoeba* (MW101 and MW102). **Methods.** Each molecularly typed strain was grown on amoeba saline (non-nutrient) agar plates with *E. coli* as prey. The plates were incubated at 20, 30, and 40°C, and the number of trophozoites was recorded daily. **Results.** The 2 corneal pathogens and one tap water strain (TIV) displayed significantly higher levels of growth ($P<.001$) within and between each of the tested temperatures when compared with the environmental strains BP and MS26. Actual growth was greatest for all strains at 30°C and slowest at 40°C. Differences in growth between the corneal isolates were not significantly different. Likewise growth between the two environmental strains BP and MS26 was not significantly different. **Conclusion.** It appears the pathogenic strains (both T-4) and the TIV tap water strain (T-5) were more aggressive in their growth characteristics than the environmental isolates BP (T-5) and MS26 (T-4). While molecular genotyping does not appear to indicate pathogenicity, higher growth levels may be an indication of pathogenicity due to adaptation to host temperatures. **Grants.** This study was funded by a NSU President's Research & Development Award (SS & HL).

Morning versus Evening Preferences and Individual Productivity

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Objective. The purpose of this study was to correlate productivity and life habits of night owls and early birds. **Background.** Recent studies have shown differences in morning versus evening people; in particular regarding personality traits, cognitive abilities, work schedules and habits. In this study, pharmacists ($n = 534$) attending a regional conference were surveyed. **Results.** The audience self reported approximately the same distribution of early birds (36%), night owls (40%), and neither (23%). Remarkably almost everyone claimed to be highly productive (87%), detail-oriented people (78%). However, only 31% were Type A personality. Over half admitted to being procrastinators (54%). Most felt they were in good overall health (55%) and only feel down sometimes (45%) or rarely (42%). Yet, most did not consider themselves highly energetic physically (57%). Many indicated they exercise infrequently (41%), but were at their ideal body weight (38%) or 10-20 pounds overweight (37%). They eat right (56%) and usually eat breakfast (63%). Most people reported only 1-2 doses of caffeine daily (63%). The majority were married (68%), but did not have children living at home (57%) or any pets (46%). Interestingly more than half of the pharmacists did not admit to taking any form of sleep aid (53%). **Conclusion.** Correlations between life habits and cognitive abilities of night owls and early birds and their individual preferences can be made.

Use of Traditional and Computerized Practical Examinations in Neuroanatomy

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Objective. The purpose of this study was to evaluate student perceptions of practical exam formats. **Background.** In a previous study, we discovered students would not be opposed to a PowerPoint practical using photos of lab specimen (HPERS 2008). The midterm practical exam utilized PowerPoint. However, the final practical was a traditional exam using tagged specimens. **Results.** Almost all of the students found the practical exams enjoyable (45%) or helpful (50%). Many students felt the traditional practical was much better than (46%) traditional practical exams they had taken previously. Most students indicated they would

request this method in the future (81%). Almost the entire class said the specimens were clear (94%). However, only 67% of the students preferred the traditional tagged practical over the PowerPoint method. Almost unanimously (92%), the class preferred this multiple choice practical exam over the typical fill-in-the-blank lab practical exams. **Conclusion.** Although students were very pleased with the PowerPoint practical, they preferred the traditional exam. However, student perceptions of this exam may be colored by the use of multiple choice questions. Regardless, it is clear the combination of multiple choice questions for tagged neuron-anatomical structures proves to be the preferred testing method. It allows for word recognition without stress over spelling and validates student time studying in lab.

The Attitudes of Nursing and DO Students toward Health Caretaker-Patient Relationships

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Objective. To investigate the attitudes of Nursing and Doctor of Osteopathic (DO) Medicine students toward the health caretaker-patient relationship. **Background.** Hojat (2005) emphasized the importance of health care professionals' empathy in improving several patient outcomes. Although patients value good medical judgment, it is important for them that their physician has strong interpersonal skills, is easy to talk to and take their concern seriously (Obesity & Fitness, 2004). Cooper (2005) indicated that nurses are perceived and may be expected to be more nurturing than physicians. **Methods.** An instrument was developed to assess the importance that participants attribute to knowing about a patient's personal life, their attitudes toward caring characteristics in health care professionals, and their interest in participating in organized group discussions. The instrument was distributed to 61 (51.3%) Nursing and 58 (48.7%) DO graduate students. **Results.** Nurses had a lower empathy/caring score than DO students ($M= 24.40, SD= 3.19$ and $M= 26.09, SD= 2.30$), $t_{(102.01)} = -3.205, p < .01$, and were more interested in participating in organized group discussions with colleagues ($M= 16.80, SD= 2.57$ and $M= 15.31, SD= 2.89$), $t_{(116)} = 2.96, p < .01$. Both groups differed significantly in a few items that assessed the personal information they would like to know about their patients. **Conclusion.** Nursing and DO students differed in some of the areas assessed, even after controlling for demographic differences (e.g., gender) among groups. The results of this study can help to understand the perceptions about professional-patient relationships in different groups of health professionals.

Post-Neutralizing Effect of Peroxide Based Contact Lens Disinfecting Solutions

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Objective. The objective of this study was to investigate whether or not a peroxide based contact lens disinfecting solution loses disinfecting capacity after prolonged use. **Background.** Contact lens wearers tend to overuse their disinfecting solutions which may lead to an increased incidence of microbial infections due to increased microbial numbers on the contact lenses. **Methods.** We tested two peroxide based contact lens disinfecting solutions by inserting 4.5 ml of each contact lens solution into a test tube and then adding 5ul of 400 U/ml catalase (in PBW). Controls contained 4.5 ml of PBW. Each test tube was inoculated with 1×10^7 cells in 0.5 ml PBW. Aliquots were removed from the inoculated solution at intervals of 0, 2, 4 and 6 hrs and plated in triplicate on nutrient agar. The test organisms were ATCC strains of *Staphylococcus aureus*, *Staphylococcus warneri*, *Serratia marascens*, *Pseudomonas aeruginosa*, *Candida albicans*, *Fusarium solani* and *Aspergillus sp.* Colony counts were made after incubation for 24-72 hrs at 35 C (bacteria) and 25 C (fungi). **Results.** Both contact lens disinfecting solutions displayed a comparable low level of ability to kill microbial organisms at the time periods and a one log reduction in microbial populations was observed after 6 hrs of incubation. **Conclusion.** Contact lens disinfecting solutions rapidly lose their disinfecting properties and must be replaced on a regular basis. Patients must be educated that proper ocular hygiene includes timely replacement of their contact lens disinfecting solution along with a strict regimen of contact lens care. **Grants.** This study was funded by a NSU President's Research & Development Award (SS & HL).

COLLEGE OF OPTOMETRY

Pediatric Research at NSU

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Objective. Many pediatric studies are ongoing at the College of Optometry. **Background.** Previously, treatment of convergence insufficiency and amblyopia was based on mainly clinical experience. Convergence insufficiency is a problem with the coordinated movement and focus of the two eyes inward on near objects. The prevalence of diagnosed convergence insufficiency is 5.3% in patients aged 6-18 years. Amblyopia is defined by the American Optometric Association as the loss or lack of development of central vision in one eye that is unrelated to any eye health problem and is not correctable with lenses. Amblyopia is estimated to have a prevalence of 3%. **Methods.** The Convergence Insufficiency Treatment Trial (CITT) is a multi-center, placebo-controlled, single-masked clinical trial comparing Home-based and Office-based vision therapy in students 9-18 years of age with convergence insufficiency. Eligible patients were randomized into one of four treatment groups for 12 weeks and followed for one year. Five of the Amblyopic Treatment Studies (ATS) involving patients aged 3-13 years with moderate to severe amblyopia and receiving treatment of either patching, vision therapy, glasses, or atropine drops are also being conducted. **Results.** Results of the CITT and ATS will be released soon. Preliminary findings will be presented. **Conclusion.** Clinical research enables practitioners to accurately determine the best treatment for their patients with convergence insufficiency and amblyopia. **Grants.** The CITT and ATS studies are national funded by the NEI/NIH and the NEI/JAEB center.

Optimal Dioptric Value of Near Addition Lenses for Slowing Myopic Progression

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Purpose. The purpose of this study was to determine the optimal power value of near addition lenses, which would create the least error in accommodative and vergence responses. **Methods.** We evaluated accommodative response, phoria, and fixation disparity when the subject viewed through various addition lenses at three working distances for 30 young adults (11 emmetropic, 17 myopic, and 2 hyperopic). Accommodative response was determined with a Canon R-1 infrared optometer under binocular viewing conditions, phoria was determined by the alternating cover test with prism neutralization, and fixation disparity was measured with a Sheedy disparometer. **Results.** For each working distance, the data of accommodative response, phoria, and fixation disparity averaged across the 30 subjects were plotted as the function of the power of the addition lenses, respectively. We fitted the data with regression curves to determine the optimal powers of near addition lenses. In addition, we found high correlations between the initial accommodative error and the optimal power of the near addition lenses and between the initial near phoria and the optimal power of the near addition lenses. **Conclusions.** The results suggest that when the effects of near addition lenses on the accommodative and vergence systems are both considered, the optimal dioptric power of the near addition lens is in a range between +0.20 D and +1.28 D for the three viewing distances. Using progressive lenses to delay the progression of myopia may have promising results if each subject's prescription is customized based on establishing a balance between the accommodative and vergence systems. Formulas derived from this study provide a basis for such considerations. **Grants.** This study was supported by NSU HPD grant #335203 and NSU PFRDG grant #335441.

Exploring Wavefront Refraction

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Objective. This is a report on the potential reliability of refractions derived from wavefront aberration measurement. **Background.** For the last several years there has been interest in fully correcting all aspects of refractive errors (higher order aberrations as well the lower order aberrations). It has been suggested that objective refractions derived from wavefront aberrometry (ADR) could replace subjective refractions (SR). **Methods.** Optometry students had the monocular SR of their right eye determined using standard optometric techniques by an experienced clinician. Another researcher used the COAS wavefront analyzer to generate a spectacle refraction on the same eye. The prescriptions were converted into power vectors (PV) and compared to each other. We looked at the correlation between measurements for various pupil diameters and also looked at the absolute differences to find what percent of ADR could actually be used by a typical patient. **Results.** Correlation between the SR and the ADR was good for all pupil sizes. However, only roughly 1/3 of the ADR based PVs were within or equal to 0.25D of the PVs for the SR. If a correction factor is applied, it approaches 50% accuracy. **Conclusion.** ADRs tend to be over-minused by a constant amount. Even when that is factored in, the results don't agree with SR closely enough to suggest clinical usefulness. An additional compromising factor would be the lack of binocular balance with the ADR. The specific pupil diameter used for analysis makes only a small difference in accuracy.

COLLEGE OF OSTEOPATHIC MEDICINE

Effects of Histology and Grade of Ovarian Cancer on the Outcome of Treatments

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Objectives. To determine what the effects of histology and grade of ovarian cancer are on the outcome of cancer evidence following combined treatment (surgery and chemotherapy) versus surgery alone, in women above and below the age of 55 in South Florida. **Background.** Ovarian cancer is devastating, and the diagnosis is usually made in the later stages of the disease. Approximately 22,000 women will develop ovarian cancer this year in the U.S. and approximately 16,000 will die this year from the disease. The treatment options depend on the stage of the disease including surgery, chemotherapy and/or radiation. **Methods.** We studied 6,646 individuals with ovary cancer diagnosed in Florida between January 1, 1995 and December 31, 2002. This is a cross-sectional study design and we used the stratified Mantel-Haenszel method, controlling for ethnicity, histology, stage, age, and marital status. **Results.** Women with papillary serous carcinoma in a localized stage who are undergoing surgery and chemotherapy are 3.12 times more likely to have cancer evidence than women with the same characteristics undergoing surgery alone. Furthermore, women with metastasized papillary serous carcinoma of the ovary who undergo surgery and chemotherapy are 14% less likely to have cancer evidence than women with the same characteristics who undergo surgery alone. Women with metastasized papillary serous carcinoma may be receiving surgery alone when they should be receiving both surgery and chemotherapy. **Conclusion.** Surgery + chemotherapy are clearly not indicated treatments in women with localized papillary serous carcinoma of the ovary, while surgery alone is not indicated in women with metastasized papillary serous carcinoma of the ovary. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Ethnic Differences in the Treatment Outcome of Lung Cancer in Florida by Histology and Stage

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Objective. Does ethnicity have an impact on the treatment outcome when controlling for stage of cancer and histology? **Background.** Lung cancer is a common cause of death in the United States. African-Americans have a higher mortality from lung cancer than do people of other races. Previous studies have been equivocal regarding the cause of this disparity. To address this lack of consensus we investigated different possible causes including the fact that people of ethnic minority groups may be more likely than the ethnic majority to have a poorer prognosis at diagnosis due to advanced cancer stage, histological type, and treatment mode, ultimately leading to poorer survival. **Methods.** We examined the effect of ethnicity, histology, and stage of lung cancer on the relationship between treatment (radiotherapy alone vs. surgery alone) and outcome, vital status (dead or alive) at the end of the study period, in all incident cases of 21,144 patients diagnosed with lung cancer in Florida between January 1st 1995 and December 31st 2002. We used the Mantel-Haenszel stratified analysis for a cross-sectional study with incident cases, using relative risks (RR) and their corresponding 95% confidence intervals. **Results.** The African-Americans were diagnosed at an advanced stage when compared to Caucasians and Hispanics, and received less surgery, and had the poorest overall survival. Ethnic minorities are more likely to die from advanced large cell lung cancer undergoing radiotherapy. **Conclusion.** Lack of access amongst ethnic minorities can explain, at least in part, the reason why Caucasians far better from radiotherapy treatment as opposed to ethnic minorities. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Emergency Preparedness Training Needs for Children with Autism

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Objectives. 1. Explore disaster preparedness education needs among parents or primary caretakers of children with autism 2. Develop and implement an education/training program for parents or primary caretakers of children with autism 3. Evaluate the education/training program. **Background.** Recent disasters have highlighted the importance of emergency preparedness and have shown gaps in addressing special needs populations. Children with autism spectrum disorders are a particular vulnerable group and face special challenges in emergency situations. **Methods.** A survey and semi-structural interviews were used to collect data from parents/caregivers of children from the Baudhuin School program. Survey data were analyzed using statistical software (SPSS). Analysis included descriptive statistics (means, ranges and frequencies) of demographic information and frequencies of survey responses. Interviews with parents/caregivers were recorded. Qualitative data analysis was performed using Atlas.ti. **Results.** The response rate was 43%; 80% of the parents had no previous training in emergency preparedness; 68% did not have a family plan and only 4% felt completely informed about community resources. Only 8% of the parents had involved their child in disaster planning. 78% of the parents were not aware of the schools' emergency plan. Preferred training format was live training (78% of respondents) provided by autism specialists (81% of respondents). **Conclusion.** In conclusion, the results of this study indicate that there is a need for emergency preparedness education/ training that address the special needs of children with autism. This model was a valid approach to identify important issues related to emergency preparedness for children with autism. **Grants and other support.** The authors appreciate the support from the Center for Bioterrorism and All-Hazards Preparedness (CBAP) without which, this project would have not been possible. The CBAP is funded, in part, by a grant from the Office of the Assistant secretary of preparedness and response (ASPR) for the U.S. Department of Health and Human Services. We would like to acknowledge the Baldhuin Preschool at the Mailman Segal Institute for Early Childhood for their participation in this innovative project.

Leisure-Time Physical Activity Levels of the US Workforce

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Objective. Determine the proportion of US workers meeting the Healthy People 2010 Guidelines for leisure-time physical activity levels in major US occupational groups. **Background.** Physical inactivity and improper nutrition are the primary determinants of the national obesity epidemic. Physical inactivity poses almost as much risk for heart disease as cigarette smoking, high blood pressure, or high cholesterol levels, but is more prevalent than any of these other risk factors. Few studies in the US have assessed physical activity levels across worker groups, despite the increasingly sedentary milieu of contemporary US occupations and increasing obesity rates among US workers. **Methods.** Self-reported leisure-time physical activity was defined as: a) light-moderate activity ≥ 30 min five or more times per week; and/or b) vigorous activity ≥ 20 min three or more times per week. Findings collected on over 150,000 US workers, who participated in the 1997-2004 National Health Interview Surveys, were stratified by occupational group. **Results.** On average, the proportions of US workers meeting recommended leisure-time physical activity levels were 31% in female and 36% in male US workers. There was substantial variation in the gender-specific rates of leisure-time physical activity levels by occupation (range: 16-55%) with the lowest rates noted in blue collar groups. **Conclusion.** Leisure-time physical activity levels were sub-optimal among all major US worker groups, with substantial variability across occupations. As part of disease prevention, health professionals should promote increased physical activity levels among those occupations identified with very low rates of leisure-time physical activity. **Grants.** This study was funded in part through the National Institute of Occupational Safety and Health (grant # R01 OH03915).

Drug Use and Hispanic Men Who Have Sex With Men in South Florida: Implications for Intervention Development

M. Isabel Fernandez, Ph.D., Professor,
Steve Bowen, Ph.D., Professor,
Cesar de Fuentes,
Luis Alzamora,
Jake Waldrop

Objective. This paper examines the socio-cultural and psychological predictors of drug use among Hispanic MSM and their impact on intervention development. **Background.** Hispanic men who have sex with men (HMSM), continue to be at high risk of HIV. Fueling this epidemic are the often co-occurring behaviors of drug use and unprotected anal sex with multiple sexual partners. Interventions that target these co-occurring behaviors and are tailored to Hispanic MSM are urgently needed. **Methods.** We used time and space sampling to recruit 566 Hispanic MSM in community and internet venues. Participants completed a computer-assisted self-interview that tapped behavioral, psychosocial, and cultural factors (e.g., gay community attachment, racism, discrimination, loneliness, familismo, bicultural orientation) which might be associated with risk and protection. **Results.** Participants reported high rates of drug use, unprotected sex, and multiple sex partners. In the final step of a hierarchical linear regression, use of drugs was significantly associated with lower orientation to the Hispanic community, stronger attachment to the gay community, less homophobia, more sex partners and more unprotected anal sex. In qualitative interviews, the need for acceptance and desire to please partners emerged as core factors associated with unprotected sex and drug use. We integrated the qualitative and quantitative data and developed *Proyecto SOL*, a four session group level intervention that is undergoing efficacy testing. **Conclusion.** In addition to being grounded in behavioral theory, interventions to reduce HIV risk among HMSM should be holistic and multi-dimensional, tailored to address men and their circumstances, incorporate the protective elements of both Hispanic and gay culture, and emphasize positive social connections. *Proyecto SOL* exemplifies this type of intervention.

Relationship between Physician Supply and Breast Cancer Survival: A Geographic Approach

Maria Farrell, BS, OM-I,
Jay M. Fleisher, Ph.D., Associate Professor,
Jennie Q. Lou, M.D., Professor

Objective. To explore the possible relationship between the numbers of physicians practicing in defined geographic areas and a subsequent association with breast cancer survival. **Background.** In 2008, an estimated 250,000 new cases of breast cancer in the United States are expected to be diagnosed. With early detection and intervention, along with improved post-operative treatment, women are also more likely to survive. Disparities remain, however, among geographic regions of the US, for reasons that remain largely unknown. This study takes a look at the possible association between the numbers of physicians in each city within the State of Florida and breast cancer survival among women aged 40+ residing in that city. **Methods.** Information on the survival rates for breast cancer for each city in Florida was linked with data obtained for the number of practicing physicians in that city. Cox Proportionate Hazard Modeling was used to assess the differences in survival by physician "supply" while controlling for other known risk factors affecting survival. **Results.** Cox Proportionate Hazard Modeling showed a direct association between the number of physicians practicing in a particular city with breast cancer survival in that particular city ($p = 0.0153$). This association shows that as physician supply decreased in a defined geographic area (city) so did the time of survival among women with breast cancer in that geographic area. **Conclusions.** To our knowledge, this is the first study to report an association between physician supply and cancer survival within defined geographic areas. **Grants.** This research was funded by a 2005 Nova Southeastern University President Faculty Research and Development Grant & the Kenyon Agneski Cancer Research Grant.

The Effects of a Unilateral Shoulder Bag on Lower Extremity Weight Distribution

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Objective. To investigate lower extremity weight bearing distribution and whether a unilateral strap shoulder bag can equalize lower extremity weight distribution. **Background.** Wearing backpacks and shoulder bags are common in young adults. The effects of the use of these bags can cause musculoskeletal problems. Backpacks can cause muscle spasm and uneven weight distribution. **Methods.** Each participant wore a shoulder bag four different ways while standing on the Postural Scale Analyzer to measure the lower extremity weight distribution. **Results.** Subjects demonstrated a weight bearing difference in standing. Right lower extremity weight bearing dominant participants exhibit more equalized weight distribution through the lower extremities when wearing a shoulder bag across the left shoulder draped. It was also found that if you wear the shoulder bag across the left shoulder draped, you bear more weight through the left lower extremity when you are left handed. Similarly, there is more weight through the right lower extremity when you are right handed when you wear the shoulder bag over the left shoulder draped. **Conclusion.** It is possible that individual prescription of a unilateral bag can be utilized to create symmetry in lower extremity weight distribution.

Human Immunodeficiency Virus and Osteopathic Manipulation Evaluation (Home) Pilot Study

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Jacob C Warren, Ph.D., Associate Professor,
Kristina Trubey, BS, OMS III: Research Fellow,

M. Isa Fernandez, Ph.D., Professor

Objective. To examine the short and long term impact of osteopathic manipulative treatments (OMT) on immune function of HIV positive men who are either antiretroviral therapy (ART) naive or have not taken ART for at least 12 months. In this presentation, we will focus on the short term impact of OMT. **Background.** Since the early 20th century, studies have been conducted to determine if OMT impact's immune function. Some studies have shown transient leukocytosis while another showed a transient basophilia post-OMT. Hodge, 2007, measured significant leukocytosis and increased lymph flow post their OMT protocol. Currently, no experimental studies utilizing OMT to impact immune function have been conducted in an HIV positive population. **Methods.** We will recruit up to 30 HIV positive men (ages 18-65) and 15 of their friends (P-OMT provider) from a Fort Lauderdale HIV specialty care practice and the NSU medical clinic. Participants will complete 2 stress scales, a daily journal, and monthly blood draws to determine complete blood cell counts with differential, CD4+ T-cells and CD8+ T-cells counts. Participants will be randomly assigned to either delayed treatment control or treatment group. The treatment group will receive a standardized OMT protocol in office monthly and daily OMT at home. **Results.** Seven participants have been enrolled to date; 2 – 3 are enrolled per week. We will present data on the short term effects of OMT. **Conclusions.** These results will provide initial information whether OMT impacts HIV positive patient's immune function in addition to the other already described benefits of the OMT techniques used. **Grants.** College of Osteopathic Medicine: Behavioral Health Promotions Program; Department of Internal Medicine; Department of Osteopathic Manipulative Medicine.

Recognition of Pituitary Disease in Long Term Care Residents

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Diane Sanders, D.O.: Assistant Professor,
Meena Makhijani, M-4 Student

Objective. Analyze clinical features, presenting symptoms and laboratory abnormalities in a series of Long Term Care residents identified with Hypopituitarism. **Background.** Hypopituitarism, a condition with deficiency of one or more anterior pituitary hormones, is recognized in elderly patients. However, the prevalence and impact in Long Term Care (LTC) residents has not been studied. **Methods.** In this study we report eight cases of LTC residents found to have hypopituitarism (one with known resection of a Macroprolactinoma), and examined the presenting symptoms, diagnostic laboratory abnormalities, potential causes, and treatments. **Results.** Upon review of the cases 6 out of 8 had pituitary hypofunction presumably secondary to vascular insufficiency. In addition, 2 out of 8 cases were identified to have chronic opioid use, potential cause of pituitary dysfunction. Also, 2 out of 8 cases were also identified to have trauma as a potential cause. All patients were started on replacement therapy for partial or complete pituitary dysfunction. **Conclusion.** Hypopituitarism, is difficult to diagnose in patient in LTC facilities as the presentation and symptoms are often missed or attributed to other chronic conditions or age. The diagnosis of partial or complete pituitary hypofunction can be made with readily available blood tests, although neuroimaging of the brain and pituitary may also be necessary.

Effects of Heel and Forefoot Lifts on Body Weight Distribution and Muscle Activity in the Lumbar Region

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Objective. Examine the amount of forefoot or rearfoot heel lift necessary to change weight distribution without altering muscle activity. **Background.** There is little research showing the effects a negative heel has on center of mass and muscle activity in the lumbar spine and how its' impact on low back pain. Patients with stenosis of the lumbar spine have relief with forward flexion and therefore, the researchers from this study made the hypothesis that if wearing high heels increases lumbar flexion then the wearing of negative heels or forefoot lifts could perhaps decrease lumbar lordosis. **Methods.** Thirty-five female students ages 18 to 35 were recruited. Weight distribution and SEMG of the lumbar spine were measured under five conditions: barefoot; 1 and 2 inch heel lifts; ½ and 1 inch forefoot lifts. **Results.** Wearing ½ inch forefoot lifts increased anterior weight distribution without significantly changing SEMG in the lumbar region. However, wearing 1 inch heel, 2 inch heel, 1 inch forefoot lifts significantly increased SEMG activity. **Conclusion.** The ½-inch forefoot lift was the only lift that had similar results to barefoot standing without having a significant difference in SEMG activity. The ½ inch forefoot lift can change weight distribution without changing muscle activity. Further research needs to examine if this effect can be demonstrated on patients with lumbar stenosis and if the patients would benefit from the increase in anterior weight distribution by increasing lumbar flexion.

New Methodology for Nonparametric Survival Comparison Applied to Kaplan-Meier and Life-tables Methods

Gabriel Suci, Ph.D., Associate Professor

Objectives. 1. Identify the most appropriate test to be used when the equality of survival curves is hypothesized, and use the new taxonomy through the guidelines. 2. Define appropriate alternative hypotheses for the given data based survival curves and assess their specific characteristics. 3. Develop a reliable nonparametric survival curves comparison based on the use of the critical margins and the guidelines. **Background.** Hypothesis tests of the equality of Kaplan-Meier and life-table survival curves is typically accomplished using one of the available methods designed for this purpose but, without doubt, the logrank test is the one most commonly used. Perhaps the reason for the popularity of the logrank test rests in its ready availability in almost all statistical software packages. However, what many users do not appreciate is that the logrank test has very low power for some alternative hypothesis. **Methods.** This research used statistical power simulations for nonparametric tests under various alternatives and a meta-analysis of 172 published papers in the New England Journal of Medicine.

Results. This study presents a new taxonomy for the test of the equality of survival curves that includes critical margins that are used to enhance the new created methodology. A specific guideline was created to ease the researcher tasks. The simulations led to tables of statistical comparison, specifically built for the purpose of the research. **Conclusion.** There is no general test that fits all comparisons, therefore the testing should be performed according to the alternative hypothesis of interest and the relationship of the hazard functions. **Acknowledgement.** SAS, STATA, and S-plus statistical packages were used to accomplish this research.

Hospice in Prisons

David L. Thomas, M.D., J.D., Professor

Objective. Prison health care personnel should advocate for prison hospice services. **Background.** The inmate population in the United States is growing increasingly older. The Bureau of Justice Statistics for corrections underscores the demographic change of prisoners' age. Of the 1.3 million prisoners in the country, 113,358 were over the age of fifty. This represents approximately a 300% increase from the 33,499 recorded in 1990. Thus older inmates now represent 8.7% of the entire population, up from 3.3% just a decade ago. This trend will escalate for a variety of reasons. **Methods/Results.** In the face of more and older inmates the challenges to providing correctional health care will get increasingly more difficult and costly. Older sicker inmates present many more chronic and terminal health problems. As prisoners become older and sicker with more chronic and terminal diseases, death in prison will become more common than it is today. Preemptively encountering this situation rather than reactively responding is a better path for most systems. Indeed, it is likely that the courts will eventually look at this issue as it becomes more frequent. **Conclusions.** Prison health care personnel and prison administrators should consider the hospice concept for their inmates for a variety of reasons. **Acknowledgement.** This presentation is from a chapter in Volume 2 of the book, *Managing Special Populations in Jails and Prisons* written by the author and is a review and advocacy for hospice services in a variety of unique ways for prisons. Volume One was published in 2005 and this current volume with this chapter is due to be published in 2008.

COLLEGE OF PHARMACY

Breast Cancer Health Literacy among Immigrant Latinas

Jose L. Calderon, M.D., Assistant Professor

Breast cancer is the leading cause of cancer death for Latinas yet they tend not to participate in positive breast health behaviors (PBHB): breast self-exam (BSE), clinical breast exam (CBE) and mammography screening. They also tend to present in late stage disease, experience less disease free survival that contribute to higher mortality rates. **Objective.** To report preliminary data from an educational intervention intended to improve breast cancer health literacy and promote PBHB among immigrant Latinas. **Methods.** We used a quasi-experimental design (200 intervention group participants and 200 delayed intervention group participants). All participants completed the Breast Health Literacy Survey and took part in a Focused Discussion Group. The intervention consisted of an animated educational and instructional video and breast self-exam training. We used Atlas.ti qualitative software to analyze 15 of 32 audio-taped FGD. Baseline survey data is reported using descriptive statistics pending 3 month follow-up survey results. **Results.** Qualitative data revealed that breast cancer health literacy resulted from experience with a family member or friend having been diagnosed with breast cancer. However, their most important sources of *health information* are doctors, television and radio. There was consensus agreement that breast cancer is curable yet the majority of women felt that if they were to develop breast cancer they would have no hope for survival. The impact of having breast cancer on their family was consistently mentioned across groups. Data from the Breast Cancer Health Literacy Survey revealed that 1) 65% did not know how or were unsure how to do a SBE, 93% believed a woman should examine her own breasts, 80% believed SBE should be done monthly but only 42.5% did so, 17% believed SBE should be done yearly and 16% did so yearly; 2) 98% perceived CBE as important, 80% believed it should be done yearly by a doctor, 84% reported having had a CBE, 61% reported having a CBE in the last 12 months, but 43% believed that women find breast lumps not doctors and 17% reported having been told they had a lump in their breast; 3) 55% reported having ever had a mammogram, 38% had one during the past 12 months, 15% reported having had an abnormal mammogram, 11% reported having had a biopsy or surgery for a breast lump, 2% were told they had breast cancer and 1% received medicines for breast cancer; 4) 19% had a family history of breast cancer but 51% did not know it is a risk factor. **Conclusions.** Breast cancer screening is sub-optimal among immigrant Latinas. There is a lack of concordance between what they know and believe about screening for breast cancer and PBHB. This contradiction appears to be related to their socio-economic status, political status and beliefs about access to health care, which may work together to result in socio-political marginalization within healthcare delivery systems. Ethno-medical (cross-cultural) studies are needed among immigrant women to better determine how best to improve their PBHB.

Mechanisms of Hypertension Associated with Obesity

Luigi Cubeddu, M.D., Ph.D., Professor

Background. Obesity is extremely common in people with high BP. However, the mechanisms by which BP increases in obese subjects are unknown. **Objectives.** We are interested in understanding the role of dietary salt and the BP reactivity to dietary salt (salt sensitivity) in the genesis of hypertension associated with obesity. We have recently shown that individuals with the metabolic syndrome are more salt sensitive than those without the syndrome. In addition, we have reported that high salt intake is associated with indices of obesity (BMI, weight and waist circumference). However, not all obese individuals have high BP, nor weight loss lowers BP in all subjects. **Methods and Results.** Therefore, a prospective study was designed to investigate the role of the salt sensitive (SS) and the salt resistant (SR) phenotypes in determining the degree of BP lowering induced by weight loss. Overweight/obese classified as SS or SR (n=45; BMI:27-35 kg/m²) entered a 1-year program of dietary restriction, aerobic exercise and metformin. Comparable reductions in obesity (8-10%), triglyceride (25%), and fasting insulin concentrations (40%) were observed in SR and SS individuals. In SS subjects the intervention lowered SBP/DBP by 8.8/6.1 mmHg, albuminuria by 63%, and decreased the subject's SS. Neither BP nor albuminuria was modified in SR by the intervention. However, in obese SS

individuals, restricting dietary salt lowered BP to a similar extent to the BP reduction achieved with the one-year intervention (weight loss). **Conclusions.** Our findings indicate that BP lowering induced by the lifestyle-metformin intervention appears to be determined by the SR/SS phenotype. Correcting adiposity in SS lowers BP because it makes the BP insensitive to dietary salt (corrects the SS phenotype). Therefore, weight loss and correction of metabolic abnormalities lowers BP in obese SS but not in obese SR, suggesting that the SR phenotype protects from obesity-induced increases in BP. These findings suggest that most of the hypertension associated with obesity is determined by dietary salt intake due to the development of a SS phenotype. The mechanisms (genetic or acquired) that determine the SS phenotype are under investigation.

Framework for Mentoring HIV Disparities Researchers Based on Productivity Data

Silvia E. Rabionet, Ed.D.

In an era of significant biomedical advances for the treatment of HIV, health disparities have persisted. Health disparities are complex and entail diverse challenges, including conducting research close to affected communities. Mentoring minority researchers becomes an essential element, since they bring perspectives and solutions that might be different from the mainstream. Based on the engagement and productivity data collected in the Puerto Rico Comprehensive Center for the Study of HIV Disparities (PR-CCHD) a multifaceted mentoring approach has been developed. During the presentation, the mentoring model and the data supporting it will be discussed. This approach is based on the understanding that mentoring is a process in which mentors and mentees advance their commitment while inspiring, enabling, and empowering each other. Mentoring goes beyond one-to-one partnerships. The 3 facets of the approach are: a) multi-institutional collaborations, b) cross-disciplinary research teams; and c) continuous competency training. Activities, such as retreats, institutes, methodology workshops, abstract marathons, and idea seminars are geared to the acquisition of the competencies needed for conducting research. Strategies foster collaboration, in which mentors with different methodological approaches to health disparities participate. The accomplishments include the formation of 8 interdisciplinary and multi-institutional teams; development of culturally adapted instruments and interventions, 90% retention of researchers; 90%-100% attendance in training activities; three-fold increase in researchers; 100% retention of mentors from 15 universities and research centers; 70% of the researchers developed a career plan. Research outcomes illustrate how each mentoring facet enhances the possibility of local research contributing to reducing HIV disparities. **Grants.** This work has been supported by the Puerto Rico- Comprehensive Center for the Study of HIV Disparities funded by NCRR 5U54RR019507-05.

A Journey Towards Cancer Drug Discovery

Appu Rathinavelu, Ph.D., Associate Professor

Among the various drugs that are used for the treatment of human sufferings anticancer drugs may receive the distinction of being the most toxic to the human body. The side effects and toxicities of the anticancer drugs are primarily due to their inability to differentiate between the cancer cells and the normal cells in the body such as bone marrow cells and epithelial cells that are actively dividing. Some of the modern approaches are geared towards developing drugs or drug combination that are less toxic to the body and more effective towards cancer cells and tissues. In the process of effectively treating a cancer growth availability of sensitive methods for diagnosis also play a major role. The cancer research at the NSU (Nova Southeastern University) College of Pharmacy is focused on developing both therapeutics as well as sensitive diagnostic methods. One of the processes we have been targeting for the purpose of stopping the cancer growth and metastatic spread of cancer is known as angiogenesis, an intra tumoral process that helps the tumor to grow beyond 1 mm³ – 1 cm³ in size. Completion of angiogenesis results in the formation of new blood vessels that traverse the tumor tissues and nourish them by providing oxygen and nutrients through establishment of blood circulation. Various growth factors, hormones and cytokines are known to be involved in the regulation of angiogenesis, however, the most important growth factor that controls angiogenesis is known as Vascular Endothelial Growth Factor (VEGF). Proangiogenic action of VEGF is mediated through VEGF receptors (VEGFR) and by the activation of associated kinases. For the purpose of inhibiting the angiogenic process several inhibitors of VEGF and VEGFR have been developed and one of them is a monoclonal antibody drug commercially available as Bevacizumab®. For the purpose of developing much stronger and highly specific angiogenesis inhibitors we utilized molecular modeling approaches in collaboration with scientists from the Lombardi Comprehensive Cancer Center at Georgetown University. Through molecular modeling approach we were able to discover two drug molecules along with several others from a collection of molecules that exceeded 1 million in number. Two compounds, code named F16 and JFD, ranked at the top compared to several others that were identified through initial computer screening. Both these compounds showed strong cytotoxic as well as anti-angiogenic effects in our *in vitro* assays. The anti-tumor activity of these compounds was confirmed using the *in vivo* experiments also. Subsequently, patent applications were filed from NSU for the anti-tumor use of these compounds through their anti-angiogenic effect. The patent application for F16 was completed in 2006 and it is nearing approval at this time. The JFD patent application from NSU was completed in 2007 and is expected to be approved in 2009 **Grants.** This project was supported by the Center of Excellence for Marine Biology and Biotechnology grant from the state of Florida through FAU, also by the PFRD grant from NSU.

Applying the Health Belief Model to Predict Intention to Comply with Antibiotic Regimen in Young Adults

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Objective. To determine predictors of intention to comply with prescribed antibiotic regimen in young adults. **Methods.** The Health Belief Model was used as the conceptual framework in this cross-sectional, descriptive study. After receiving a 10-day oral antibiotic prescription at a university pharmacy, a convenience sample of 201 students completed a short questionnaire on their intention to take the antibiotic as directed, and on their perceptions of susceptibility to illness in general, severity of adverse consequences (e.g., re-infection, future antibiotic resistance) if the antibiotic were not taken as directed, and barriers (e.g.,

inconvenience, difficulty of use) and benefits (e.g., successful treatment of underlying infection) of taking the antibiotic. Reliability analyses were first conducted for each multi-item 5-point Likert scale before calculating the summated score for the measure. Linear regression was used to determine the association of explanatory variables with intention to take the antibiotic as directed. **Results.** Usable response rate was 78.6% (n = 158). Scales' internal consistency ranged from medium to high (Cronbach's Alpha = .50 to .84). Respondents' average age was 20.5 (S.D. = 2.0). Those with higher perceived severity of adverse consequences and lower perceived barriers were more likely to respond that they would comply with their antibiotic regimen as directed ($p < 0.05$). **Conclusion.** Strategies used by pharmacists when consulting young adults on their antibiotic compliance should include giving them information on the severity of adverse consequences if the regimen were not followed as directed as well as lowering their perceptions of the barriers to taking the antibiotic.

Deconvolution Analysis of the Interaction between Tacrolimus and Ketoconazole

W.R. Wolowich, Pharm.D., Assistant Professor

Objective. To improve the precision of the point estimate and develop predictors of tacrolimus bioavailability, alone and when administered concomitantly with CYP3A and P-gp inhibitors. **Background.** Tacrolimus (TAC) has been used for immunosuppression after solid organ transplant for over ten years. Despite numerous pharmacokinetic studies of TAC the absolute bioavailability (F) remains poorly defined. **Methods.** Subjects were 19 adult renal transplant recipients receiving TAC as part of an immunosuppression regimen. TAC was administered by intravenous (IV) infusion after a 24-hr washout period; a single oral (po) dose of KT (400 mg) was administered followed by the same IV dose of TAC. Whole blood was drawn to provide pharmacokinetic (PK) profiles after IV administration. Steady state oral TAC PK profiles with and without KT were similarly obtained. A two-compartment model for intermittent IV infusion and po dosing at steady state were simultaneously fit and deconvolution analysis was performed using WinNonLin Professional V 5.2. Percent change in F and the Ln transformed KT/TAC po dose ratio were fit to a sigmoid Emax model. **Results.** Systemic clearance of TAC was not altered by 400 mg of oral KT (control 0.102 L/h/kg (0.089-0.114) Vs keto 0.088 L/H/kg (0.072-0.103) $p = 0.15$). TAC F was altered by KT (14 % (11-17) ctrl; 35% (26-44) KT; $p=0.0006$) in a dose dependent fashion (Emax 350 %, $EC_{50} = 4.2$ mg keto /mg TAC, $\gamma = 15$). **Conclusion.** TAC F is altered by KT, not by changing systemic clearance, but rather by increasing absorption from jejunal and ileal sites.

POSTER PRESENTATIONS

COLLEGE OF ALLIED HEALTH AND NURSING

Size Variability of the Distal Abdominal Aorta in Health Volunteers

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Purpose. To evaluate if there is a need for revision of ultrasound diagnostic criteria for abdominal aortic aneurysm and develop a nomogram by age, body habitus and/or gender. **Methods.** Two classes of students in the BHSc Vascular at NSU were the subjects in this study. The distal aorta was measured in centimeter in transverse and antero-posterior projection 1 to 2 cm proximal to the iliac bifurcation. The age, weight and height were reported by each subject at the time of the study. **Results.** It appears that female gender and smaller body habitus (by BMI) are associated with smaller distal abdominal aorta than male gender and/or larger body habitus. **Conclusion.** However in comparison to other studies, Age appears to affect the size of the aorta more than any other factors. This study may serve as a pilot to establish more tailored criteria on a scale model or nomogram, with considerations to age, gender and BMI, to establish more accurate risk assessment, diagnosis and prognosis.

Resilience and Nursing Leadership

Diane Y. John, M.S.N., A.R.N.P., B.C., Assistant Professor,
Marcia J. Derby, M.S.N., Assistant Professor

Based on the global nursing shortage, the nursing faculty shortage, and the graying of current nursing faculty it is important to transition new nurses into faculty roles. Many nursing programs are recruiting nurses who may not be completely prepared to independently assume the faculty role. Although they have years of clinical nursing experience, the transition to academia continues to be a challenge and may affect their decision to leave or to stay. Resilience has been described as a dynamic process whereby people "bounce back from adversity and go on with their lives" (Dyer & McGuinness, 1996, p. 277). The adversities that new faculty may encounter could be attributed to the old adage of how *nurses eat their young*. Included in all aspects of adversity are challenge, change, and disruption, all of which may be experienced by new faculty as they transition in their new roles. **Purpose.** To examine the resilience of nurse leaders in academia. **Objectives.** To facilitate the construction of effective mentoring programs, faculty development workshops, and programs that support continuing education. To provide a supportive environment with resources tailored to the nurturing and growth of new nursing faculty. **Method:** This proposed pilot study will utilize descriptive quantitative methods to answer the following research questions: What is the degree of resilience of nurse educators in an academic setting? Does resilience vary by gender, ethnicity, age, position or length of time in an academic setting?

Shoulder Joint and Muscle Characteristics in the Recreational Weight Training Population

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Objective. The purpose of this study was to investigate shoulder joint and muscle characteristics in the recreational weight-training (RWT) population to determine specific risk-related adaptations that may occur from participation. **Background.** Shoulder disorders attributed to weight-training are well documented in the literature; however, a paucity of evidence-based research exists to describe risk factors inherent to participation. **Methods.** Ninety male participants ages 19-47 (mean age 28.9), including 60 individuals who participated in upper extremity RWT and 30 controls with no record of RWT participation were recruited. Active range of motion (AROM), posterior shoulder tightness (PST), adjusted strength values and strength ratios were compared between the RWT participants and control group. **Results.** Significant mobility differences were present ($p < .001$) between the groups. RWT participants had decreased mobility when compared to the control group for all AROM measurements with the exception of external rotation which was greater. Strength ratios were significantly greater in the RWT group ($p \leq .001$) implying agonist/antagonist muscle imbalances. **Conclusion.** RWT participants are predisposed to strength and mobility imbalances as a result of training. The imbalances identified have been associated with shoulder disorders in the general and athletic population, thus may place RWT participants at risk for injury. Exercise selection that mitigates strength and mobility imbalances may serve to prevent injury in this population. Clinicians and strength and conditioning professionals should consider the biomechanical stresses and adaptations associated with RWT when prescribing upper extremity exercises.

Designing Health Professions Curricula for the Future

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Purpose. This study investigated how health professions' curriculum incorporates the five core competencies identified by the National Academies Institute of Medicine (IOM) in preparing students for integrated and innovative interdisciplinary clinical practice. These core competencies include patient-centered care, interdisciplinary teams, evidence-based practice, quality improvement, and informatics. **Methods.** Data collection included a self-designed, cross-sectional, self-administered questionnaire mailed to 500 U.S. programs in medicine, nursing, pharmacy and physical therapy combined with semi-structured follow-up phone interviews. Microsoft Excel and SPSS 14.0 were used to develop descriptive and inferential statistics with results reported using standard frequency analysis. Responses to open-ended questions were analyzed for common themes. **Results.** 100 programs responded via curriculum committee chairs and program chairs. Across disciplines, 80% of respondents recognized IOM competencies; physical therapy (PT) reporting the lowest awareness. The main barriers to implementing core competencies were adding more curriculum hours (64%) and administrative challenges (36%). Curricular integration is achieved primarily through joint experiential educational and clinical experiences and through student interaction with other healthcare profession practitioners. **Conclusions.** Awareness of IOM core competencies is lacking across disciplines. All programs should increase familiarity with the IOM core competencies as well as curricula application of these concepts to foster student development as members of integrated, multidisciplinary healthcare teams. Health professions programs should examine how they can better incorporate the IOM core competencies to promote efficient and collaborative delivery of quality care for the 21st century.

Healthcare Needs in an Underserved Population: Physical Therapy Needs Assessment

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Objective. To determine the need for physical therapy (PT) services in an underserved population of migrant health workers and dependents with incomes 150% below the poverty line. **Background.** According to the APTA Code of Ethics: A Physical Therapist shall endeavor to address the health needs of society. Based on observations and referrals during a finite period, although need was recognized, few clients were referred for PT. **Methods.** A primary care clinic, averaging 15,000 - 20,000 free client visits annually was used. Four senior PT students performed retrospective and concurrent data collection under supervision of a PT faculty instructor. The APTA Guide to Physical Therapist Practice was used to determine diagnoses appropriate for services. Medical diagnoses were retrospectively reviewed from 1220 randomly selected active (January 2002 through March 2003) medical records. Concurrent data was collected based on the number of clients referred relative to total clinic client visits. **Results.** Services were deemed appropriate in 681/1220 or 56% of the cases in the records reviewed. Concurrently, the volunteer physicians and physician assistants referred 87 or 6.2% clients out of 1403 total clinic visits to the PT students for intervention. **Conclusions.** Based on data collected, a high number of migrant farm workers and dependents that could benefit from PT services was determined. Actual referral rates were far lower than the review indicated. This study demonstrates the need for PTs to deliver services to this population and educate other health care professionals, including physicians, about the benefits of physical therapy and the breadth of services. **Grants.** Study was made possible through an American Physical Therapy Association Grant to Study A Hybrid Method of Clinical Education.

COLLEGE OF DENTAL MEDICINE
(asterisk denotes presenter)

Biaxial Flexural Strength of Nanocomposites

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Objective. To evaluate the bi-axial flexural strength of 5 nanocomposites vs. 1 universal composite (control). **Methods.** Cylindrical discs with a diameter of 9 mm and thickness of 1.2 mm were made using a custom-made stainless steel mold. Six specimens were prepared for each material. Specimen's surface was covered with mylar strips and polymerized in between 2 glass slabs to achieve consistent surface finish. Specimens were immersed in distilled water for 72 hrs. The strength test was carried out using a universal mechanical testing system (Instron 8841, Instron Corp., Canton, MA). In the biaxial fixture, the specimens were supported by three stainless steel ball bearings with diameter of 1.6 equally spaced inside the fixture. A mylar strip was placed on top of each specimen to more uniformly distribute the load from the piston. The specimen was loaded at a crosshead speed of 0.5 mm/min until failure. Statistical analysis was performed with ANOVA and Student-Newman-Keuls (SNK) at $p < 0.05$. **Results.** (figure a) ;The results, in MPa \pm SD are shown in the Table, Filtek Z250 had a statistically significantly higher value than all other composites. TPH3 was no different than Premise and Simile. Simile was no different than Simile or Filtek Supreme. Filtek Supreme was statistically higher than Premise ($p < 0.05$). Grandio was statistically higher than Premise, TPH3, and Simile. Grandio and Z250 had similar values. **Conclusions.** Grandio showed a statistically significantly higher biaxial flexural strength ($p < 0.05$) than all other nanocomposites tested, except for Filtek Supreme, which had similar values. Figure A:

Clinical Comparison of Dissolving and Non-dissolving Marketed Whitening Strips

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Objective. This randomized, examiner-blinded, parallel design clinical trial compared efficacy of two marketed whitening strips. **Methods.** 55 subjects were randomly assigned to one of two whitening treatments: Listerine Whitening® Quick Dissolving Strips worn twice a day until completely dissolved for 14 days (dissolving strips) or Crest® Whitestrips® Premium Plus containing 10% hydrogen peroxide and worn 30 min twice a day for 10 days (non-dissolving strips). Whitening efficacy was measured objectively from CIELAB digital measurements at Baseline, Day 8, Day 11 and Day 15, and product safety was assessed via subject interviews and oral examination conducted at each visit. Whitening response was compared at each visit and at the end-of-treatment (Day 15 for the dissolving strips vs. Day 11 for the non-dissolving strips) using the analysis of covariance method. **Results.** The study participants ranged in age from 19 to 71, and 64% of subjects were female. The two groups were well-balanced with respect to the Baseline tooth color. At each study visit, the non-dissolving strip group demonstrated significantly greater tooth color improvement ($p \leq 0.0006$) relative to the dissolving strip group. At the end-of-treatment, use of dissolving strips resulted in adjusted means of -1.35 for Δb^* and 0.95 for ΔL^* , while the use of non-dissolving strips resulted in adjusted means of -2.12 for Δb^* and 1.72 for ΔL^* with treatment differences being highly significant ($p < 0.0005$). In addition, the non-dissolving strip group demonstrated significantly greater ($p < 0.02$) tooth color improvement (both Δb^* and ΔL^*) at Day 8 compared to the dissolving strip group at day 15. No adverse events were reported in any of the treatment groups. **Conclusion.** Use of the 10% hydrogen peroxide non-dissolving strips resulted in significantly greater tooth whitening relative to that of the dissolving whitening strips.

Clinical Study Evaluating 0.454% Stannous Fluoride Dentifrice on Established Gingivitis

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Objective. A double-blind, randomized controlled 3-month clinical trial was conducted to evaluate the effects of a 0.454% stannous fluoride sodium hexametaphosphate dentifrice on established gingivitis. **Methods.** Adults with mild gingivitis were randomized to a therapeutic dentifrice with 0.454% stannous fluoride sodium hexametaphosphate dentifrice (Crest® ProHealth™) or a negative dentifrice control (Crest® Cavity Protection). No prophylaxis was administered in this treatment study, subjects were simply dispensed assigned test products, and instructed on at-home unsupervised brushing. Efficacy was measured at baseline and Month 3 via a whole mouth clinical gingivitis index (Loe-Silness), while safety was assessed from examination and interview. **Results.** A total of 70 subjects (35 per group) were evaluated at Month 3. That population averaged 31 years of age, mean (SD) gingivitis scores were 0.27 (0.13), and groups were balanced with respect to demographics and gingivitis scores. At Month 3, the 0.454% stannous fluoride group had experienced a 54% reduction in gingivitis, and a 56% reduction in bleeding, differing significantly ($p < 0.001$) from baseline on each endpoint. Between-group comparisons showed a 24% reduction in gingivitis and a 23% reduction in gingivitis, with the 0.454% stannous fluoride dentifrice differing significantly from the negative control. Adverse events were limited to mild oral irritation (both groups), with no early "for cause" dropouts. **Conclusion.** In a general population, 3-month use of 0.454% stannous fluoride sodium hexametaphosphate dentifrice for the treatment of gingivitis resulted in 23-24% reductions in gingivitis and bleeding relative to a regular dentifrice control.

Fissure Sealant Adaptation and Penetration Into Enamel

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Objectives. To evaluate the adaptation and penetration into occlusal fissures of two different types of fissure sealants. **Methods.** Extracted third molars ($n = 12$) with evident occlusal fissures were cleaned with a pumice/water slurry and randomly divided into two groups and sealed following the manufacturers' directions as follows: Group 1 - Embrace fissure sealant (Pulpdent). Surfaces were cleaned and dried, then etched for 15 seconds. Excess water was removed leaving the surface slightly moist. Sealant was applied from cusp to cusp without covering marginal ridges and light cured for 20 s using a halogen light at 500mW/cm². Group 2 - ClinPro. (3M). Surfaces were cleaned and dried then etched for 15 s. The etched surface was rinsed and thoroughly dried. Dried surfaces appeared frosty white. Sealant was placed making sure not to go beyond etched area, and light cured for 20 s. Teeth were thermocycled (500x) and sectioned with an Isomet in a mesio-distal direction (5 slices per tooth). The sections were examined under the SEM. The marginal adaptation of the sealants was evaluated under the SEM using the following criteria: 1 = Smooth adaptation. Sealant flows with enamel. No ledges; 2 = Sealant is not well adapted. Ledge may be present. The penetration ability of the sealants was evaluated under the SEM using the following criteria: 1 = Sealant penetrated 1/3 the total length of the fissure; 2 = Sealant penetrated 1/2 the total length of the fissure; 3 = Sealant penetrated the total length of the fissure. The results were statistically analyzed using a t-test. **Results.** Embrace showed consistently better marginal adaptation than ClinPro in fissures of the same approximate width and depth ($p < 0.05$). **Conclusions.** The superior adaptation and penetration of Embrace may produce longer lasting sealants.

Stress distribution in maxillary central incisor restored with different post systems

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Objective. The purpose of this study was to evaluate the stress distribution in a maxillary central incisor restored with different post systems by using Finite Element Analysis (FEA) and Photoelasticity (PH). **Methods.** Six bi-dimensional models were created and compared with healthy maxillary incisor (control). The following posts systems were analyzed: carbon fiber, glass fiber, zirconium, stainless steel, titanium and cast metal (Cu-Al alloy). A 100 N load was applied on the palatal surface of the crown at a 45-degree angle to the tooth's longitudinal axis to simulate tearing function. The stresses were evaluated by determining the von Mises stress distribution and maximum fringe order. **Results.** The greatest stresses were observed in the middle third of the roots on facial surfaces. The higher stresses concentrations in dentin were created by zirconium, stainless steel, titanium and cast metal post and were nearly the same. The fiber-reinforced posts induced significantly lower stress concentration in dentin compared to metallic and ceramic posts. The stress distribution for fiber-reinforced posts was similar to that recorded in a tooth without post. **Conclusion.** Results from this study show that the biomimetic behavior of nonmetallic post may reduce the risk of root fracture determining a uniform stress distribution.

Lip positional changes associated with upper incisor AP correction

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Objectives. Determination of any predictable relationship (ratio) of these changes in Caucasian patients was the Objective of this study. **Methods.** Pre- and post-orthodontic lateral cephalograms from de-identified records of 37 (18 male, 19 female) Caucasian private orthodontic practice "non-extraction" patients (mean age = 14 yrs, 5mos) who originally presented CL I minimal crowding or slight CL II malocclusions were traced, analyzed and compared. UL and LL positions were determined by linear measures from E line. Upper incisor (U1) incisal edge position was measured linearly perpendicularly from NP plane and from E plane. **Results.** Statistical analysis showed that with a mean retraction of UI-E of 3.30mm, the UL-E retracted by a mean of 1.7mm and LL-E 1.65mm ($p < 0.001$). For every one mm retraction of U1-NP, UL-E reduced 0.68mm and LL-E 0.65mm ($p < 0.05$). **Conclusion.** From this study one can conclude that in Caucasian patients of this age group, one mm upper incisor retraction will result in approximately 1/2mm reduction in lip procumbency; a ratio of 2:1.

Relative Efficacy of Two Marketed Hydrogen Peroxide Whitening Strips

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Objective. Efficacy of two marketed hydrogen peroxide whitening strip regimens was compared in this randomized, examiner-blinded clinical trial. **Methods.** A total of 57 healthy adult volunteers were randomized to one of the two treatments: Listerine Whitening® Quick Dissolving Strips (LWQD strip) or 6% hydrogen peroxide Crest® Whitestrips® (control strips). Both products were used twice daily for 14 days per manufacturer's instructions: LWQD were worn until completely dissolved and the control strips were worn for 30 min per application. Efficacy was measured objectively as L*a*b* color change using digital images of the maxillary anterior teeth at Baseline, Day 8, and Day 15. **Results.** The average age of study participants was 42.1 and 63% were females. At Day 8, adjusted mean (SE) Δb^* was -0.82 (0.12) for the LWQD strip and -1.32 (0.12) for the control strip while adjusted mean (SE) ΔL^* was 0.97 (0.14) and 1.75 (0.14) for the LWQD and the control strips, respectively. At the end-of-treatment at Day 15, adjusted mean (SE) Δb^* was -1.50 (0.17) for the LWQD strip and -2.03 (0.16) for the control strip. For ΔL^* , end-of-treatment, adjusted means (SE) were 1.33 (0.20) for the LWQD strip compared to 2.06 (0.18) for the control strip. Groups differed significantly for both Δb^* and ΔL^* at the end-of-treatment ($p \leq 0.03$) and at Day 8 ($p < 0.005$) favoring the control strip. No product-related adverse events were reported. **Conclusion.** Use of the 6% hydrogen peroxide control strip provided superior whitening versus a dissolving hydrogen peroxide whitening strip.

Time-Dependent Effects of 5.25 % NaOCl and MTAD on the Calcium Content of Root Dentin

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Objectives. The aim of this study is to evaluate the time-dependent effects of 5.25% NaOCl with or without subsequent MTAD (Dentsply, Tulsa Dental, OK, U.S.A.) application on the calcium content of root canal dentine. **Methodology:** Crowns of single-rooted teeth were removed and the roots were bisected longitudinally. The pulp remnants were removed with a toothbrush. The root halves (n = 35) were covered with two layers of nail varnish, leaving the root canal surface exposed. The specimens were, then, dehumidified in a sterilizator for 45min at 120°C. Except one group (5-min MTAD treatment alone), all specimens were immersed in either 5.25% NaOCl or distilled water for 5, 10 or 15 min. Specimens treated with three different application times of 5.25% NaOCl were further exposed to MTAD treatment (5 min). The amount of calcium release from dentin following single (MTAD, NaOCl or Distilled water alone) and combined (NaOCl+MTAD) treatment regimens were determined by flame photometry. The calcium release in groups subjected to single solution treatments were analyzed statistically for each immersion period (1, 5 and 10 min) using Kruskal-Wallis Analysis of Variance. Groups subsequently treated with NaOCl, MTAD and distilled water were statistically subjected to Wilcoxon Signed Rank test for the three immersion periods. Kruskal-Wallis Analysis of Variance and Wilcoxon signed ranks tests were used for statistical analysis of data ($p = 0.05$). **Results.** Regardless of treatment time, all "single" and "combined" treatment regimens removed significantly more calcium than that of control ($p < 0.05$). 5.25 % NaOCl +MTAD combined treatment groups removed significantly more calcium than their single versions, regardless of treatment time ($p < 0.05$). **Conclusions.** Subsequent irrigation with MTAD significantly increases the liberation of calcium ions from root canal dentin treated with 5.25% NaOCl for 5, 10 and 15 minutes.

COLLEGE OF MEDICAL SCIENCES

Histochemical Analysis of Bronchial Secretions in Asthma: A Quantitative Assessment

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Objective. We compared the characteristics of acidic and neutral staining areas of lung airways between asthmatic and non-asthmatic patients. **Background.** Alteration of the airway content is the hallmark of asthma. We examined paraffin embedded AB/PAS stained sections of asthmatic and non-asthmatic bronchi. The airway areas of acidic, Alcian Blue (AB), neutral, periodic acid Schiff (PAS), and mixed positive staining was estimated. **Results.** The asthmatics had more mucous AB positive cells overall. The AB/PAS positive prevalence was variable, ranging from dark blue to light magenta. The examined airways of asthmatics contained intra luminal debris and mucous plugs. **Conclusion.** These findings suggest that, in fatal asthma, the morphologic remodeling of the airway wall includes gland enlargement, with altered mucous, combination that likely contributes to the airway obstruction in fatal asthma. **Grants.** This study was funded by a NSU-HPD Faculty Research Grant (AM).

The Impact of Depressive Symptoms and Chronic Diseases on Active Life Expectancy in Older Americans

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Objective. We prospectively examined whether depressive symptoms (DS) in older adults negatively affected active live expectancy (ALE), or remaining years free of disability, and mortality, independently and in the presence of chronic diseases, and after stratification by gender. **Methods.** This was a prospective cohort

study of the first three waves (1993-1998) of the Asset and Health Dynamics Among the Oldest Old (AHEAD). Data were collected from the University of Michigan and analyzed at the University of South Florida. Data was a nationally representative sample of community-dwelling adults age 70 and older (n=7,381). Measurements of DS (CES-D, 8-item version), self-reported cancer, diabetes, heart disease, or stroke, difficulty with Activities of Daily Living (ADLs), death, and estimates of total, active, and disabled life expectancy were obtained. **Results.** DS reduced ALE by 6.5 years for young-old men (age 70), 3.2 years for old-old men (age 85), 4.2 years for young-old women, and 2.2 years for old-old women, and these effects remained significant at all ages and across gender even after controlling for chronic disease, the one exception being DS and cancer in old-old women. DS also reduced TLE significantly, although controlling for some chronic diseases (particularly cancer and stroke) eliminated the effect of DS across age and gender groups. **Conclusion.** Depressive symptoms represent a serious and distinct threat to independent functioning in older adults. Whether experienced alone, or in combination with chronic diseases, depressive symptoms shorten ALE substantially. Timely diagnosis and treatment of depressive symptoms in older adults may delay the onset of disability and improve the quality of life.

Student Perceptions of Neuroanatomy Study Aids

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Objective. The purpose of this study was to evaluate the effectiveness of neuroanatomy study aids. **Background.** As scientific knowledge expands, time in the curriculum for basic sciences is decreasing. To maximize student efforts, study aids were provided for students (n=177) in Optometry (n= 104), Physical Therapy (n=43) and Occupational Therapy (n=29). **Results.** Many students did not take advantage of the practice practical (46%). Those who did said it was only somewhat helpful (29%). The majority of students attended the lab review (87%) and found it very helpful (41%) or somewhat helpful (40%). Most students (82%) used the review workbook, both the practice questions as well as the keywords (50%). However some students just used the practice questions (28%). In contrast, almost the entire class used the anatomy department website and found it very helpful (92%). **Conclusion.** The practice practical required students to return to the lab. The lab review meant additional lecture time. However, the website gave students 24 hour access to view lab specimen. Most importantly, they were able to review and learn the material at their own pace, outside of class, at their convenience. The results showed that this generation of learners prefers using a website over traditional study aids. Future studies should focus on developing a state of the art website to maximize student learning of neuroanatomy.

Different Calcium Channels Mediate Basal and Stimulated MSH Secretion

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Objective. We investigated the types of calcium channels involved in basal and K-stimulated MSH secretion. **Background.** Both basal and K-stimulated secretion of melanophore-stimulating hormone (MSH) from neurointermediate lobes (NILs) of the anole are Ca dependent. Nimodipine and BAY K 8644, which block and potentiate, respectively, Ca influx through L-type Ca channels, block and potentiate, respectively, K-stimulated MSH secretion but have no effect on basal secretion. These observations suggest that K-stimulated MSH secretion is mediated by Ca influx through L-type Ca channels whereas basal secretion is not. We further investigated the Ca channels involved in both basal and K-stimulated MSH secretion using toxins which preferentially block different types of Ca channels. **Methods.** Anole NILs were placed in a perfusion chamber and the MSH content of the perfusate was measured using the *Anolis* skin bioassay. None of the toxins affected the assay. **Results.** sFTX-3.3 a blocker of P/Q and T-type Ca channels, inhibited basal but not K-stimulated secretion. Agatoxin, a selective P/Q-type Ca channel blocker, had no effect on either basal or K-stimulated secretion suggesting that the block of basal secretion by sFTX-3.3 was due to its effects on T-type channels. The L-type Ca channel blocker FS-2, behaved like nimodipine and suppressed K-stimulated secretion but not basal secretion. A selective N-type Ca channel blocker, ω -conotoxin GVIA, had no effect on either K-stimulated or basal secretion. **Conclusion.** These results indicate that basal and K-stimulated secretion are mediated by Ca influx through different Ca channels: basal through T-type and K-stimulated through L-type Ca channels. **Grants.** This study was supported by a NSU-HPD Research Award.

Enzyme Characterization of L-Methionine γ -Lyase from *Porphyromonas gingivalis*

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Objective. In this study, we characterized the enzyme L-methionine γ -lyase from *Porphyromonas gingivalis*, a contributor to periodontal disease. **Background.** Oral malodor (halitosis) is caused mainly by volatile sulfur compounds (VSCs), such as hydrogen sulfide, methyl mercaptan, and dimethyl sulfide. It is thought that these highly toxic compounds are involved in the induction or progression of periodontal disease. It has been proposed that methyl mercaptan not only may be responsible for oral malodor but also may contribute to the pathogenesis of periodontal disease. L-Methionine γ -lyase (EC 4.4.4.11) catalyzes the α,γ elimination of methionine to produce methanethiol (methyl mercaptan), α -ketobutyrate and ammonia. This enzyme has been detected in several anaerobic nonoral microorganisms and has been implicated as a major pathogen in adult periodontitis. However, little is known about the role of the enzyme L-methionine γ -lyase and its product methyl mercaptan in the pathogenesis of oral microorganisms. **Results.** The enzyme had its highest rate of methyl mercaptan production

during the first 15 min of the reaction, had an optimum activity at ~ pH 7.0 and had its highest activity at an apparent temperature of 55°C. Rate of methyl mercaptan production was greatest when the substrate concentration was between 10-100 mM. However, concentrations above 100 mM seem to inhibit L-methionine lyase activity. **Conclusion.** If L-methionine γ -lyase activity is responsible for the pathogenesis of this organism, future studies could lead to the inactivation of this enzyme and control the progression of periodontal disease.

Emotional Engagement and Movie Images: Laughing Matters in Lecturing?

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Objective. To determine various forms, benefits and general principles underlying the use of film images during lectures in education of health care professionals. **Background.** Demonstration of motion pictures has been described as a method to facilitate learning of psychosocial and behavioral aspects of medicine. Application of movies or actors' images for instruction in basic sciences has received little attention. In this research, I have focused on how to evoke a positive emotional engagement of students by infusing humor via cinematic images during lectures. **Methods.** Literature search on the topic has been performed. Students' comments on the effect of movie images shown during my Physiology course were analyzed. The comments were obtained from evaluations completed by four different groups of students: Osteopathic Medicine, Dentistry, Optometry and Pharmacy. **Results.** Pictures from 16 movies were shown during lectures. Displaying actors' images creates 1-2 minute transition intervals during lectures that help listeners to stay receptive to the complicated material, shift attention to the ideas and points to remember and build memorable associations between physiological concepts and clinical conditions. Movie titles can serve as effective punch lines in humorous transition to a new topic or in imposing an accent on a previously discussed topic. Students referred positively to certain Hollywood celebrities or movie titles. Their comments confirmed the engaging effect of actors' images. **Conclusion.** Cinematic images can be used as effective elements of medical presentations that help to gain and hold audience attention, facilitate creative thinking and memory, and impart information in an enjoyable way.

COLLEGE OF OPTOMETRY

Low Vision Rehabilitation of an HIV+ Patient with Retinal Necrosis and Optic Atrophy

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Background. Immunosuppression due to Human Immunodeficiency Virus (HIV) can lead to ocular complications from opportunistic agents. Retinal necrosis is a potentially visually devastating consequence of ocular infection in HIV+ patients. Cytomegalovirus retinitis and acute retinal necrosis secondary to herpes simplex virus or Varicella Zoster Virus are the most common causes of retinal necrosis. Infection commonly begins in the peripheral retina and spreads posteriorly, resulting in necrotic retina with a corresponding absolute scotoma. Optic neuropathy is also a common result of infection and may cause additional visual acuity or visual field loss. Significant visual impairment often occurs rapidly, and low vision rehabilitation, including referrals to appropriate services and agencies, is essential for patients to remain independent. **Case Summary.** A 29-year-old woman was referred to us for a low vision evaluation. She had been diagnosed with HIV approximately two years ago. The patient experienced vision loss five months prior to our evaluation, at which time she was diagnosed with retinal necrosis. Past ocular history was also significant for trauma OS twelve years prior with resulting visual loss. Entering distance visual acuities were 4/20M OD (20/100 Snellen Equivalent) and 2/25M OS (20/250 Snellen Equivalent). Visual field testing showed severe inferior and superonasal restriction OD as well as severe superior and inferonasal restriction OS. Fundus examination revealed extensive necrotic retinal tissue OU, chorioretinal scarring and scleral buckle OS, and marked optic atrophy OU. Based on the patient's stated goals and her performance with devices during the evaluation, +8.00 D half-eyes were prescribed for reading, a 3X full-field spectacle-mounted telescope with a +3.00 D reading cap was prescribed for computer use and larger-print reading material, and a 4X12 handheld telescope was prescribed for spotting. The patient was referred to the Division of Blind Services for assistance in retaining employment. Additional community services were recommended for transportation and other daily living tasks. **Conclusion.** The ocular manifestations of HIV can be visually devastating. However, low vision rehabilitation can help patients to effectively use their remaining vision. Referrals to appropriate services and agencies will allow these patients to maintain an independent and productive lifestyle, both financially and personally.

Keratoconus: A One-Sided Debate

Andrea M. Janoff, O.D., Assistant Professor

Background. A 30-year old man diagnosed with refractive amblyopia OD, was referred for a contact lens fitting. After additional testing was completed the diagnosis was changed to unilateral keratoconus and the patient was successfully fit to a specialty gas permeable lens design OD. **Case Report.** Presenting symptoms included blurry and double vision with haloes around lights and intermittent tearing, OD. Unaided distance visual acuity (DVA) was 20/100 OD and 20/15 OS. Manifest refraction included a significant degree of myopic astigmatism OD and only a minimal amount OS. While performing biomicroscopy keratoconic signs of prominent corneal nerves and Vogt's Striae were observed OD only. Keratometric mires were distorted OD and clear OS. Corneal mapping with the Humphrey Atlas Topographer revealed a moderately steep apex OD only with abnormal corneal irregularity (CIM) and shape factor (SF) measurements elicited. OD. On pachymetry the central corneal thickness was measured as 466 μ m OD and 523 μ m OS. A light feather touch fluorescein pattern with average edge clearance was seen with the prescribed contact lens OD. After adaptation, the DVA was 20/20 OD with the contact lens compared to 20/15 OS without correction, and a resolution of the patient's presenting symptoms was reported. **Conclusion.** Keratoconus is sited as a clinically non-inflammatory corneal ectasia that is typically bilateral and asymmetric. The question of whether monocular keratoconus truly exists is controversial. This case reflects a rare circumstance where only the monitoring of progression will determine whether the initial diagnosis of unilateral keratoconus stands the test of time.

Choroidal Melanomas

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N. Truong

Background. Choroidal melanomas are the most common primary malignant intraocular tumor and the second most common type of primary malignant melanoma in the body. This lesion is most commonly found in people of northern European descent and slightly more in males than females. Incident of choroidal melanoma is highest around age 55 years. Ocular symptoms of choroidal melanoma include blurred vision, painless and progressive field loss, floaters, and severe ocular pain. If a lesion is suspected of being a choroidal melanoma, treatment modalities such as enucleation, plaque brachytherapy, external beam radiation, or laser photocoagulation and transpupillary thermotherapy may be implemented. These lesions have a very high fatality rate—about 30-50% of patients with choroidal melanoma will die within 10 years from diagnosis and treatment—therefore, timely diagnoses and referral is essential for preservation of the patient's vision and life. **Case Report.** A 26-year-old white female presented with history of decrease vision in the right eye over the past few weeks. Ocular history and medical history is noncontributory. Best-corrected vision was CF@ 3ft in the right eye and 20/20 in the left eye. Examination of anterior segment revealed an APD in the right eye with all other findings within normal limits. Fundus examination revealed a large elevated white mass in the right eye. After a thorough examination and testing, a diagnosis of choroidal melanoma was made and a referral was generated. Treatment of plaque brachytherapy and laser photocoagulation was implemented. **Discussion.** Enucleation is typically done for large tumors where the basal diameter is greater than 15 mm and the height is greater than 10mm. Plaque brachytherapy is a widely accepted alternative mostly used for medium size melanomas where the basal diameter is less than 15 mm and the height is less than 10mm. However, there is a great possibility that there might be a chance for recurrence, which then leaves no option but to enucleate the eye. External beam irradiation has a success rate similar to plaque brachytherapy and typically used for medium size melanomas. Laser photocoagulation and transpupillary thermotherapy are used for smaller melanomas or can be used in conjunction with some of the other treatments to decrease the chances of recurrence. **Conclusion.** A discussion of the case presented aims to provide clinicians with a clearer understanding of the clinical findings, differential diagnoses, and management of choroidal melanomas.

Visual Needs of School Aged Children with Autism: Are They Truly Different?

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Purpose. Due to physical, emotional and mental impairments, autistic patients can be challenging to examine. Knowledge concerning their visually related daily activities allows the doctor to better tailor the examination to the individual. Are the visual needs of the school aged autistic different than non-autistic children? This study will investigate that question. **Methods.** Information concerning visual care and parent perceptions was collected from a survey of parents, and guardians caring for children and adults with autism. This survey consisted of a series of yes/no and likert scale questions. Surveys were collected from two sources: Baudhuin Preschool at the Mailman Segal Institute, National Alliance Autism Research (NAAR) charity/awareness walk, Ft. Lauderdale, Florida. Surveys could be completed by hand and via a website. For the purpose of this study, school aged is defined at 6 years of age and above. **Results.** 32 out of 68 complete surveys fit the age requirement for participation. 26 attended public education, 4 private and 2 did not respond. Out of the 26 public school selections, 17 are mainstreamed. Participation in the following visually taxing activities were questioned: reading-18 subjects (56%), writing-14 (44%), computer work-21 (65%), hand-held video games (PSP, game boy)-18 (56%), TV monitor based video games (Playstation, Nintendo)-15 (47%). 13 subjects (41%) responded that they participated in reading, writing and computer work. 12 out of the 32 respondents take part in sports. Basketball (7 out of 12) had the largest involvement. **Conclusion.** With the recent rise in the rates of autism spectrum disorders, optometrists must be part of the diagnosis and treatment team. As with other populations with special needs, autistic patients require more time and energy on the part of the doctor to examine. This study shows that despite physical and mental barriers that exist, autistic children have the same visual needs as non-autistic children.

Optic Neuropathy

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Background. Heroin is an opiate that produces a rush, euphoria, and tranquility. It may be injected or inhaled and produces both psychic and physical dependence. Pinpoint pupils are seen. **Case Report.** A 22-year-old woman came to our clinic for a routine eye examination. Her best-corrected visual acuities were 20/20-2 O.D. and 20/15 O.S. She was unaware of the mild gradual painless vision loss in her right eye. She showed 20% red desaturation O.D. and, despite the desaturation, her pupils were normal in response and size. Ishihara color vision test was normal. Her right optic nerve revealed an area of temporal pallor. She admitted to 2 and a half years of heroin addiction and concomitant alcohol abuse. She was currently in a drug rehabilitation program and had been clean for 30 days. **Methods.** The complications of toxic or nutritional effects of alcohol are well documented. The neuropathy manifests as a painless, progressive, and symmetrical process ascribed to the deficiency of Vitamin B 12, thiamine, and folate. It responds well to vitamin supplementation. The visual fields tend to show central or centro-cecal field defects. Alcohol potentiates the body's natural opiates and—combined with heroin—is even more potent. The affects of heroin can be due to dosage toxicity or due to a toxin released when drug is heated. An acute side affect of heroin is orthostatic hypotension and pulmonary hypertension; ischemic or hemorrhagic strokes are common. Complications include peripheral neuropathy, myelopathy, Parkinsonism, leukoencephalopathy, cerebellar ataxia, and, most significantly, optic atrophy. **Conclusion.** It is almost impossible to separate the role alcohol abuse played in the development of optic atrophy of this patient addicted to heroin *versus* an anterior ischemic optic neuropathy due to orthostatic hypotension induced by heroin highs. Elimination of the toxic agents, rehabilitation, and nutritional supplementation are key. Repeated visual fields and monitoring of the patient's optic nerve function over time is recommended.

Iris Neovascularization

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Iris neovascularization can arise from ischemic retinal vascular diseases as well as retinal detachments. When the ischemic retina can no longer supply an adequate amount of blood to the eye, new blood vessels begin to grow towards the normal retina for oxygenated blood. If the retina has no viable vascularized tissue left, blood vessels begin to grow forward, to gain their blood supply from the iris. Although iris neo can sometimes be hard to detect, it is very important to carefully inspect the iris for new vessel growth around the pupillary border. This is a case report about a 93 year old white female who came in complaining of a red painful eye. She was diagnosed with an anterior uveitis secondary to a tractional retinal detachment. She was started on Pred Forte and referred to a retinal specialist for evaluation and follow up care.

The Effect of Near Addition Lenses on Accommodative Response

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Purpose. Progressive addition lenses (PAL) have been shown to be effective in slowing down myopia progression in some patients. It has been proposed that the near lenses work by reducing the patient's lag of accommodation. In this study, we investigate the difference in accommodative responses in subjects with and without near addition lenses under both monocular and binocular viewing conditions. **Methods.** Eight optometry students (average age of 25.3 ± 3.5 years) participated in this study. The averages of refractive errors of these subjects were -2.53 ± 1.40 D (OD) and -2.66 ± 1.51 D (OS), respectively. The accommodative responses with and without +2.00 D addition lens were measured with a Canon R-1 optometer. Under monocular viewing conditions, the subject's right eye viewed a target through a Badal optical system and the left eye was occluded. Accommodative responses were measured from 0 D to 8 D in 1 D intervals. Under binocular viewing conditions, the target was placed at 40 cm from the subject and the accommodative responses were measured from the subject's right eye. **Discussion.** The accommodative response with +2.00 D lens under monocular viewing condition did not follow the predicted effect, that the accommodative response would be shifted up 2 D. This result could be explained by the accommodative system being a negative feedback system. This theory states that a certain amount of accommodative response error is necessary for maintaining a steady state accommodative response. Studies on PALs slowing myopia progression have been based on the belief that the blur image on the retina might cause an elongation of the axis of the eye and that near addition lens might help reduce retinal blur at near. However, our results suggest that the near addition lens may not improve retinal defocus. More importantly, for some subjects, it may even increase the retinal blur, having a negative impact on refractive error development. **Grants.** This study is supported by NSU grant PSFA#335338 and a grant from CIBA Vision.

COLLEGE OF OSTEOPATHIC MEDICINE

Impact of Smoking on Treatment Outcome of the Glottis Laryngeal Cancer

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Objective. To investigate the effect of age and smoking on the treatment outcome of the glottis laryngeal cancer. **Background.** The incidence of laryngeal tumors is closely correlated with smoking. Death from laryngeal cancer is 20 times more likely for the heaviest smokers than for nonsmokers. **Methods.** A total of 1745 individuals with glottis squamous cell carcinoma diagnosed between January 1st of 1995 and December 31st in 2002 were studied in this research. We used the relative risk as the measure of association of treatment (surgery vs radiotherapy) and vital status (dead or alive). We considered factors such as ethnicity, histology, stage and age groups (young vs elder) and the behavior of smoking. We used the Mantel-Haenszel stratified analysis to determine if each of the above is a confounder, effect modifier, or just a risk factor. **Results.** Age group was found to be a confounder, while stage was an effect modifier for the treatment-outcome association. Smoking was found to be a risk factor, as well as the squamous cell carcinomas. The elderly (>60 years old), smoker patients who undergo radiotherapy alone are 46% more likely to die than those who undergo surgery alone, among those with localized glottis and squamous cell carcinomas of the larynx. **Conclusions.** Further research need to be done in order to fully explore what other factors may confound or modify the main association. Unfortunately, the cancer registry data has limited information, poorer than the hospital discharge data. The importance of this study resides in a reliable finding about the elderly smokers that should follow a surgery treatment that is less risky than radiotherapy. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Lung Cancer Treatment Influenced by Gender and Smoking

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Objectives. 1. Is there an effect on treatment of lung cancer based on a patient's gender? 2. Is there an effect on lung cancer patients who are undergoing treatments but fail to quit smoking? **Background.** Lung cancer is the leading cancer killer in all racial groups in the United States. It is responsible for approximately 3,000 lung cancer deaths annually. The prevalence of smoking in the United States is 28 percent for males and 25 percent for females, 18 years old or older age. Overall, the relative risk of developing lung cancer is increased about 13-fold by active smoking and 1.5-fold by long term passive exposure to cigarette smoke. **Methods.** Our analysis is based on the Florida cancer registry, similar to a cross-sectional study design, but selecting only incident cases, 88,994, between January 1st 1994 and December 31st 2002. We used the relative risk as a measure of association between treatment (surgery vs. radiotherapy) and outcome, vital status (dead vs alive). We analyzed two factors gender and smoking, and we defined exposure as treatment (surgery as "exposed" vs. radiotherapy as "unexposed"). The stratified Mantel-Haenszel methodology was used to assess confounders and/or effect modifiers. **Results.** Adjusting for localized stage and non-small cell histological type, females had a much higher risk of dying from radiotherapy alone than males, both smokers and non-smokers. This is a cross-over effect of both found effect modifiers: tobacco and gender. **Conclusion.** Females are at higher risk at dying from lung cancer when undergoing radiotherapy alone, which perhaps is not the best treatment for lung cancer patients. **Funding and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Accuracy of Death Certificates in a Suburban Community

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Objective/Background. Death certificates provide epidemiologists with statistical data regarding causes of death within the community. But when the certificates are filled out erroneously it can skew the statistician's data. The aim of our investigation was to determine if these certificates are being completed correctly, how frequently errors are occurring, and what types of errors are being committed by clinicians in our county. **Methods.** 371 consecutive death certificates issued by community physicians from Broward County between February and March of 2007 were reviewed. Errors were grouped into major categories as follows: unacceptable cause of death (UC), non-specific cause of death (NS), irrelevant information (II), incorrect order (IO), and incorrectly completed (IC). **Results.** Forty-eight percent of death certificates were found to have at least one of the five types of inaccuracies in the cause of death section. These were UC errors 30.19%, NS errors 14.82%, IC errors 6.47%, II errors 4.04%, and IO errors 3.50%. **Conclusions.** Nearly half of all death certificates reviewed in this study were found to be inaccurate. These errors result in misleading information to epidemiologists, patient families, and state and federal agencies. Since most physicians only receive informal training in death certification during medical school or residency, and the completion of this form is not an integral component of most physicians' practice, this study shows that continuing education is needed on this topic and identifies the areas for focus. Death certification tutorials have been initiated by the Broward County Medical Examiner's Office to address this problem.

The Effect of Histology and Smoking on Treatment Outcomes of Urinary Bladder Cancer

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Objective. The objective of this study was to compare the effects of histology and smoking on treatment outcomes of urinary bladder cancer. **Background.** Urinary bladder cancer is the fourth most common cancer in men and the eighth most common cancer in women. The two most frequent histological types are the urothelial and papillary carcinomas. Studies have shown that age, smoking (tobacco), and treatment types are risk factors for urinary bladder cancer. **Methods.** The study had 28,162 incident cases of patients with urinary bladder, between January 1st, 1994 and December 31st, 2002, based on the Florida Cancer Registry. The stratified Mantel-Haenszel method was used in this routine database that was similar to a cross-sectional study. The selection of cancer incident cases allowed for the use of relative risk (RR) as a measure of association between the vital status (dead or alive) and treatment type: surgery (SR) vs. surgery+chemotherapy+other adjuvant therapy (SR+CT+ADJ). **Results.** Histology was found to be a confounder. We also found that smoking was an effect modifier when controlling for histology. Patients who smoke and were diagnosed with urothelial carcinoma were 32% more likely to be at risk of dying than non-smokers with the same histology. Among the patients treated with SR+CT+ADJ, 19% of the failures were attributed to smoking. **Conclusions.** Smoking greatly affects the treatment outcomes of urinary bladder cancer. SR+CT+ADJ is concluded as a more risky choice for treatment of patients with urothelial carcinoma who smoke compared to surgery alone. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Marital Status, Treatment Choice, and Insurance Type Impact on the Treatment Outcome of Patients with Colorectal Cancer

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Objective. Does marital status and insurance type influence treatment outcome? **Background.** Colorectal cancer is the third most common cancer in men and women and the second leading cause of death in the Western world. Colon cancer is more common in those over 50 and its risk increases with age, but if it is caught in an early stage, it is often curable. This type of cancer can take many years to develop so that is why early detection with screening greatly improves the chances of a cure. **Methods.** We analyzed 9186 incident cases of colorectal cancers with papillary adenoma or adenocarcinomas in a localized stage, between January 1st 1995 and December 31st 2002. The association between treatment outcome (death vs alive) and treatment (surgery vs. surgery+adjuvant therapy) was analyzed using a stratified Mantel-Haenszel methodology, the stratum specific relative risks and their corresponding 95% CI being calculated and compared. **Results.** The single/divorced/widowed patients who underwent surgery alone were twice more likely to die than the patients who underwent surgery+adjuvants for a colorectal cancer in a localized stage and papillary adenoma or adenocarcinoma, adjusting for Medicare insured patients. Individuals who are single, divorced, or widowed showed an increased risk of death if adjuvant treatment was not used. **Conclusion.** The cancer registry data shows an overwhelming need for adjuvant therapy in this specific situation. Programs to inform health care workers and patients are a possibility. It would be helpful to know how many of the individuals who do undergo adjuvant therapy do not do so due to the unavailability of resources. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

Percutaneous Reduction of Tibial Plateau Depression Fractures: A New Technique

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Objective. To present a novel percutaneous operative technique for tibial plateau depression fractures. **Background.** Tibial plateau fractures account for approximately 1% of all fractures. Using the Schatzker classification, type II and type III patterns account for the majority of fractures. True depression and split depression type fractures commonly occur from trauma involving an axial load with a valgus or varus deforming force. Historically, when surgical intervention is indicated, these fracture patterns have been treated with open reduction and internal fixation. **Methods.** We have developed a percutaneous method of reduction and fixation utilizing the Kyphon Inflatable Balloon Tamp. Our indications for surgical intervention with this technique include >3mm of depression, <5mm of gapping, and >10° varus or valgus instability at 20° flexion. The complete technique is presented in the poster. **Results.** To date we have performed the technique on 6 patients. Four patients have had outcomes comparable to formal open reduction and internal fixation. Two patients have been lost to follow-up. **Conclusions.** The inflatable balloon tamp has been effective in a small group of patients for the reduction of pure depression and split depression tibial plateau fractures. **Acknowledgement.** Presented at the Annual Clinical Assembly of Osteopathic Specialists / American Osteopathic Academy of Orthopaedics. This poster won the 1st prize.

Sub-Splenic Ectopic Pregnancy Adjacent to a Communicating Rudimentary Uterine Horn

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Objective. Determine the appropriate diagnostic tool in the surgical management of ectopic pregnancy located on the left upper quadrant and subsplenic. **Background.** Müllerian agenesis is a female developmental anomaly that remains one of the most interesting disorders encountered by contemporary obstetricians and gynecologists. While the majority of women with müllerian duct anomalies have little problem conceiving, they have higher associated rates of spontaneous abortion, premature delivery, and abnormal fetal lie and dystocia at delivery. **Methods.** A rare case of a tubal pregnancy in a displaced communicating rudimentary uterine horn is discussed. Image diagnosis and pathological examination of the uterus and left pericolic gutter mass revealed that this uterine malformation was a unicornuate hemiuterus with a communicating, non-cavitary right rudimentary horn and displaced left communicating tube with ovarian streak. **Results.** A 4 x 5 cm mass was identified in the left pericolic gutter about 5 -7 cm from the spleen appearing to be remnants of an ovarian streak. Histopathologic examination confirmed fragments of chorionic villi with hemorrhage and segments of a fallopian tube, consistent with an ectopic pregnancy. Biopsies taken showed the presence of a corpus luteum. **Conclusion.** In our case, the abnormally high position of the tubal ectopic pregnancy meant that it was outside the transvaginal ultrasound field, but there was evidence of pelvic collection. Laparoscopy, in these exceptional cases, is the most accurate diagnostic tool that carries significant advantages with effective surgical management, thereby avoiding Laparotomy with superior visualization of the abdominal cavity.

Association of Treatment and Cancer Evidence for Localized Stages of Papillary Thyroid Cancer in Florida

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Objectives. Does evidence of cancer post-intervention depend on the patient's age and the type of treatment received? **Background.** Thyroid cancer is the most common malignancy that affects the tissues of the endocrine system, and affects women more often than men, usually between the ages of 25 and 65. Currently, the most common types of treatments are surgery or surgery followed by an adjuvant therapy. **Methods.** This study has a design similar to a cross-sectional study, but dealing with incident cases. We studied 3910 individuals with localized papillary thyroid cancer diagnosed in the state of Florida between January 1st 1994 and December 31st 2002, using the relative risk as a measure of association and the corresponding attributable risk % (AR%) for risk causality. The main association was between evidence of cancer (evidence vs. no evidence), and treatment type (surgery+adjuvant therapy vs surgery alone). The Mantel-Haenszel stratified methodology was used to identify confounders and effect modifiers. **Results.** Ethnicity, gender and geographical location, were not confounders nor effect modifiers. Age was found to be a risk factor, with the highest evidence of cancer found in the age 60+ group. Surprisingly, the age <45 group had higher evidence of cancer than did the age 45-60 group. In addition, surgery plus adjuvant therapy had greater evidence of cancer than did surgery alone. Practically, surgery alone is a better treatment than surgery+adjuvant therapy, for localized stage with papillary morphology. **Conclusion.** Our analysis shows that the two age groups that had the worst prognosis were the <45 and 60+ age groups. We can infer that the increased age and declining overall health in the elderly population influences these results. For the younger population, it may be attributed to a more severe case of cancer or another underlying immunological problem. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

The Effect of Cranial Osteopathic Treatment on Visual Function

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Objective. The objectives of this study were to determine if cranial osteopathy has an effect on visual function, and if that effect remained once the treatment was discontinued. **Background.** Although anecdotal evidence indicates that patients who undergo cranial osteopathic manipulation claim to experience an improvement in visual performance, there are few publications that demonstrate changes. **Methods.** Subjects were evaluated for cranial asymmetry and underwent optometric examination. The treatment group received cranial osteopathic manipulation, while the control group had a light pressure applied to their cranium. Subjects were reassessed for the presence of cranial dysfunction and underwent repeat optometric examination. This protocol was carried out for a total of 8 visits during the intervention phase. All subjects then returned for 8 follow-up visits during which only the optometric measurements were performed. A questionnaire was filled out by each subject after the intervention phase to assess the subject's perception of group assignment. **Results.** There was a statistically significant main effect for visit time in 8 of the 12 parameters measured. There was also a statistically significant effect for control vs. treatment in 2 of the parameters measured. **Conclusions.** Our study failed to consistently demonstrate a statistically significant change in visual function with the use of cranial osteopathic manipulation over time. We did see a significant change in multiple visual function parameters over time within both the control and treatment groups. Based on our results, we propose that active motion testing during cranial osteopathic assessment affects the cranial system to a level that results in a measurable effect. **Grants.** This study was funded by a grant from the Osteopathic Heritage Foundations.

Adequacy of Treatments in the Case of the Melanoma of the Skin Controlling for Age and Stage

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Objectives. Is surgery+adjuvant therapy a better treatment than surgery alone in the case of localized melanoma of the skin? **Background.** Melanoma of the skin is a cancer that begins in the melanocytes. The cells keep making melanin which often gives the tumor brown or black color. People with darker skin may have lower incidence of the disease, but may develop melanoma as well as people with white skin. **Methods.** We studied 18,550 individuals diagnosed for the first time with melanoma of the skin in the State of Florida from January 1st 1994 to December 31st 2002. The study design was a cross-sectional, with incident cases over the study period. We used the relative risk as a measure of association. The stratified Mantel-Haenszel methodology was used to assess confounders and/or effect modifiers of the main association between treatment (surgery vs surgery+adjuvant therapy) and vital status (dead vs alive). **Results.** We analyzed age groups, stage at diagnosis (i.e. localized vs. regionalized), ethnicity and histology. Age groups and stage were effect modifiers, while the latter two were not found to be neither effect modifiers nor confounders. Patients who had surgery alone in localized stage, age 37-50, were 7.39 times more likely to die than those who underwent surgery+adjuvant therapy. When comparing the surgery alone versus surgery+adjuvant we found that patients who underwent surgery alone were 4.6 times more likely to die than patients that underwent surgery + adjuvant therapy. **Conclusion.** According to age of patient and the stage of the disease, patients younger than 36 years old have higher chances of dying if they undergo surgery alone than older patients: patients between 37-50 years old have higher chances of dying from surgery alone in the localized stage than in regionalized stage. Surgery alone is not indicated in the localized melanoma of the skin. **Grants and Acknowledgement.** This study was funded in part through the HPD Research Grant for Florida Cancer Registry Analysis, 2004-2007. The views expressed herein are solely those of the authors and do not necessarily reflect those of FCDS, the contractor of FL-DOH.

A Comparison of Risk and Protective Factors for Regular Alcohol Use Among Young MSM

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Objective. To examine risk and protective factors associated with regular use of alcohol among White, African American and Hispanic young men who have sex with men that can guide intervention development. **Background.** Misuse of alcohol and its sequelae are major public health problems. Despite this, a high proportion of adolescent and young adults report regularly using alcohol. Because early initiation of alcohol use predict later misuse and is linked to negative physiologic and behavioral consequences, understanding the risk and protective factors associated with regular use of alcohol, particularly among socially oppressed youth (e.g. those who are ethnic or sexual minorities) is important for intervention development. **Methods.** We recruited 189 gay/bisexual males (age 15 to 22) from three ethnic groups in Chicago, IL and Miami-Dade and Broward Counties, Florida to complete a self-administered questionnaire. In addition to psychosocial factors, youth reported use of alcohol and other drugs and sexual practices during the last 90 days. We examined the predictors of regular alcohol use at the univariate level and then ran a logistic regression using the significant univariate predictors to identify risk and protective factors. **Results.** A large proportion of participants regularly used alcohol. Alcohol was also a contributor to high risk sexual practices. In the logistic regression, older age and having more attachment to the gay community emerged as risk factor for regular alcohol use, while being in a long term relationship and strong ethnic identification emerged as protective factors. **Conclusions.** These findings should help guide development of preventive interventions. **Grants.** Adolescent Trial Network (ATN) 020.

Ethnicity Impact on the Outcome of Surgery versus Combined Therapy with Surgery and Radiotherapy in Localized Breast Cancer

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Objectives. What is the effect of ethnicity on the outcome of combined treatment (surgery plus radiotherapy) versus surgery alone? **Background.** Breast cancer is the most common female cancer and the second most frequent cause of cancer related death in females in the United States. Over 210,000 cases of invasive breast cancer will be diagnosed in women in the United States within the calendar year. **Methods.** Patients diagnosed for the first time with breast cancer in the state of Florida between January 1, 1995 and December 31, 2002 were studied in this analysis. A total of 55, 564 patients with localized breast carcinoma and ductal or lobular carcinomas were analyzed based on their vital status (death vs alive) and treatment (surgery+radiotherapy vs. surgery alone). The Mantel-Haenszel stratified analysis was used to assess confounders and effect modifiers. The relative risk (RR) was used to measure the association between treatment and outcome. **Results.** Patients that underwent surgery alone were two times more likely to die than patients who underwent both surgery and radiotherapy. Histology and ethnicity were found to modify the effect of the association between breast cancer treatment and outcome. Controlling for both, ethnicity and histology, the most significant finding was that African-Americans had a higher risk of death if they undergo surgery alone for localized ductal carcinoma compared to Caucasians. **Conclusion.** The results are limited because we were unable to compare lobular carcinoma across ethnicity due to non-significant associations. For African-Americans and Caucasians with ductal carcinoma, the advisable treatment would be surgery and radiotherapy as this has a lower risk of mortality.

COLLEGE OF PHARMACY

Willingness To Pay For Pharmacist Based Immunization Services Among Hispanics

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Objective. To determine if health status (HS) and education on immunization (EOI) impact the willingness to pay (WTP) for pharmacist based immunization (PBI) services in a Hispanic community. **Background.** Hispanics are significantly less likely to be vaccinated against influenza and pneumonia than their White counterparts. The causes of these disparities were suggested to be multifactorial, including various sociodemographics, English fluency, access to care, health status and health care utilization. Conveniently accessible, PBI services have shown to increase vaccination rates but little is known if they also contribute to narrowing the racial immunization gap. **Methods.** A prospective, randomized, open-label pilot study was conducted in an outpatient pharmacy locating in a Hispanic predominant community. Participants (n=102) who met the study criteria were randomly assigned to either receive EOI or none (control). Subsequently, they participated in a 2-minute self-administered bilingual questionnaire to measure their HS and WTP for PBI services. **Results.** Both groups were equally matched in baseline characteristics. The median HS score in the education group was similar to the control (8 vs 7.5, respectively, from a 10-point scale). In the education group, the WTP for PBI services increased by 61% when compared to the control (p<0.05). Moreover, 93% of the respondents in the education group were receptive of the PBI services as compared to 66% in the control (p<0.05). Multiple logistic regression analyses showed no correlation between study parameters and WTP. **Conclusion.** Regardless of the HS, EOI significantly increased the WTP for and the acceptance of the PBI services among Hispanics.

Evaluation of Missing Medication Doses in Hospital Drug Distribution Processes

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Objective. To investigate the causes of missing medication doses (MMD) in a hospital drug distribution system and to generate ways to minimize these problems. **Background.** MMD are considered to be medication errors. Omission of a dose or delay of medication administration may contribute to negative patient outcome. Information to determine the root cause of MMD is still limited. **Methods.** This is a prospective, observational, single center study conducted over a month. Labels for MMD were generated daily if necessary from each nursing unit. All labels for schedule medications were reprinted and verified daily. Exclusion criteria were "On Demand" and "PRN" medications. Labels were evaluated for causes of MMD and comparisons of MMD between nursing units. **Results.** A total of 352 MMD labels were evaluated. The two major reasons for MMD were patient transfers from one nursing unit to another (59.9%) and new admissions (14.8%). Analyses revealed 6 North and 6 South had the highest volume of MMD (20.5%) followed by 4 Main (18.5%). Medications which were not floor stock (>74%) accounted for the highest MMD. **Conclusion.** Transfer from one unit to another accounted for the highest incident of MMD followed by new admissions. Majority of the MMD included medications that were not floor stock. It is recommended that pharmacy should expand the automation on the floor to include drugs which are more frequently ordered and to implement a detail check list including transfer of medications during patients transfer from one unit to another.

Effects of Statin Treatment and Withdrawal on MAP Kinases in Vascular Smooth Muscle Cells

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Background. Abrupt discontinuation of 3-hydroxy-3-methylglutaryl-coenzyme-A-reductase inhibitors (statins) is associated with increased cardiovascular risk. **Objectives.** To investigate the molecular mechanisms determining the increased cardiovascular risk observed after statin withdrawal. **Methods and Results.** In this study we investigated the effects of statin treatment and withdrawal on angiotensin II (All) actions in rat aortic vascular smooth muscle cells (VSMC) in culture. In VSMC, All stimulated the phosphorylation of extracellular signal-regulated kinase 1/2 (ERK1/2), and of p38 mitogen-activated protein kinase (p38 MAPK), at an EC50% of 0.86 and 3 nM, respectively. Maximal stimulation was observed after 5-10 min of exposure to All. Pretreatment with 1-3 μ M simvastatin for 24 hours inhibited All-mediated stimulation of ERK1/2 and p38 MAPK phosphorylation; without affecting the levels on non-phosphorylated MAPK. Washout of simvastatin produced a rebound increase above control levels of All-mediated phosphorylation of ERK1/2 and p38 MAPK. As previously reported for other agonists, the rebound increase of All effects was observed from 1 to 3 hours after statin withdrawal, and was lost at later times. The basal levels of phosphorylation and the amount of non-phosphorylated kinases were unaffected by statin withdrawal. Similar effects were observed with lovastatin. **Conclusions.** Our results suggest that statins may modulate All- effects in VSMC, and that transient increases in All effects mediated via the MAPK pathway may play a role in the vascular dysfunction associated with statin withdrawal.

Is Bupropion Sustained-Release Effective for Smoking Cessation: A Meta-analysis

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Objective. To evaluate efficacy of bupropion sustained-release for smoking cessation compared with placebo. **Background.** Bupropion sustained-release is an aid for smoking cessation; however, patients who failed quitting smoking after using bupropion sustained-release complained of its effectiveness. **Methods.** An extensive literature search through PubMed and references of identified studies was performed. Investigators selected randomized control trials in which bupropion SR alone or as a part of a combination therapy was compared to placebo in smokers who were motivated to stop smoking. To access the efficacy of bupropion sustained-release, investigators used short-term (12 weeks) and long-term (52 weeks) abstinence rate, confirmed with a biochemical test. The primary outcome was continuous abstinence rate at week 12. The secondary outcome was continuous abstinence rate at week 52. **Results.** Out of a total of 23 studies that were initially reviewed, nine randomized controlled trials met the inclusion criteria, including 5889 participants. The primary outcome indicated that bupropion sustained-release was more effective than placebo (OR 2.05, 95% CI, 1.51-2.79). Eight trials showed significantly higher abstinence rates in bupropion groups. The secondary outcome (OR 1.74, 95% CI, 1.22-2.49) indicated that bupropion sustained-release was still more effective than placebo. **Conclusion.** Meta-analysis results indicated that bupropion sustained-release was more effective than placebo for smoking cessation.

Evaluation of State Drug Information Resource Requirements

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Background. Requirements for drug information (DI) resources can differ by state, practice setting or specialty. **Objective.** To determine each State's requirements for the type and format of DI resources that must be kept in a pharmacy according to general or specialty practice. **Methods.** All States were targeted to identify mandated DI resources. Criteria were: 1) whether a range or specified references are permitted, 2) if general resources or specialty practices require additional references, 3) whether format (i.e. print or electronic) is specified, and 4) if law resources are mandated. Information was culled from each State's Board of Pharmacy. **Results.** All Boards of Pharmacy listed reference requirements. Sixty-five percent of States specified additional resources according to specialty or site including: chemotherapy, compounding, dialysis, immunization, parenterals, nuclear/radiopharmaceuticals, sterile injectables, as well as clinics, hospital pharmacies, home health services, opioid treatment programs, specialty pharmacies, long-term care pharmacies, prison clinics, and

telepharmacies. Only 3.8% of States (South Dakota and Minnesota) require print or hardcopy editions of resources must be kept in the pharmacy. Seventy-seven percent of States also mandate that current law resources must be maintained in the pharmacy. **Conclusion.** Almost all States now allow electronic resources to satisfy Board of Pharmacy requirements. The majority of States also require that DI resources other than core holdings be maintained when the scope or setting includes specialty practices. Consequently, pharmacists need to be aware that their scope of practice can dictate which DI resources they need to maintain to be in compliance for their State.

Angiotensin II increases c-Fos and c-Jun mRNA Expression in Cultured Rat Astrocytes.

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Background. Previous studies, in vascular smooth muscle and other peripheral cells, have shown that angiotensin II (Ang II) induces the expression of several early response genes in human and rats including *c-fos*, *c-jun*, *c-myc* and NF-kappa B. Stimulation of early response genes by Ang II is associated with increased gene expression and production of growth factors, vasoconstrictor agents, adhesion molecules, and chemotactic factors. **Objective.** To determine the effects of Ang II on the expression of *c-fos* and *c-jun* in medullary and cerebral rat astrocytes. **Methods.** Brainstem and cerebellum astrocytes were treated with 100 nM Ang II for 15 to 90 minutes and mRNA was extracted. Using specific primers for *c-fos* and *c-jun*, rt-PCRs were performed and amplicons were separated by gel electrophoresis. **Results.** Ang II stimulated the mRNA expression of *c-fos* and *c-jun* in a time-dependent manner. This effect was observed as early as 15 minutes and was still apparent even 90 minutes after Ang II stimulation. **Conclusions.** The findings of this study show for the first time that Ang II stimulates the mRNA expression of *c-fos* and *c-jun* in astrocytes and suggest a role for Ang II in the regulation of early response genes in the CNS. Further studies are underway to determine the relevance of this finding in the central regulation of blood pressure. **Grants.** Supported by a NSU President's Faculty Research & Development Grant and a NHLBL R15 HL077199-01.

Evaluation of State Schedule II Controlled Substance Laws

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Background. States have the authority to mandate laws that are more stringent than federal law, which often results in important differences in prescribing and dispensing patterns throughout the country. **Objective.** The objective of this study was to evaluate schedule II controlled substance laws in all 50 states, the District of Columbia, and Puerto Rico to identify important differences. **Methods.** The current state laws and regulations regarding controlled substances were evaluated using the following criteria: whether prescription expiration dates are mandated, whether partial fills are permitted, whether changes can be made to prescriptions after consulting with a physician, whether maximum days' supplies are mandated, and whether pharmacists can dispense emergency oral prescriptions. **Results.** Thirty-nine states and Puerto Rico (77%) mandate prescription expiration dates. Partial filling is permitted in all states, the District of Columbia, and Puerto Rico (100%). All 50 states and the District of Columbia (98%) permit pharmacists to make prescription changes after consulting with the physician. Nine states (17%) have mandated maximum days' supplies that a physician may prescribe. All 50 states, the District of Columbia, and Puerto Rico (100%) permit pharmacists to dispense drugs in an emergency situation with verbal prescription. **Conclusion.** Pharmacists should be aware that differences exist among the states, the District of Columbia, and Puerto Rico regarding schedule II controlled substance laws. Understanding these differences is fundamental to the profession. **Acknowledgement.** This research is accepted for publication in the journal of Pharmacy Technology.

Isoprenylation and Angiotensin II- Effects: Role of Statins

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Background. Statins not only lower (LDL) cholesterol levels by inhibiting the HMG-CoA reductase, but also affect the isoprenoid pathway decreasing the concentration of active-isoprenylated small GTPases in the cell membrane. We previously showed that statins significantly decrease Angiotensin II (AII) stimulated ERK phosphorylation. **Objectives.** To investigate if statin-induced decrease in AII-stimulated ERK phosphorylation is mediated through isoprenylation pathways. **Methods and Results.** We studied the effects of statin treatment on AII-stimulated phosphorylation of extracellular signal-regulated kinase 1/2 (ERK1/2) in rat aortic vascular smooth muscle cells (VSMC) in culture. These effects were evaluated in the presence or absence of geranyl geranyl pyrophosphate (GGPP) and or farnesyl diphosphate (FPP) and their inhibitors. Pretreatment with the isoprenoid inhibitors FFPI (10uM) or GGPI (10 uM) alone, did not affect the activation of ERK1/2 by AII. The combination of FFPI + GGTI significantly inhibited AII induced ERK1/2 stimulation (1.538 ± 0.16 vs. 0.649 ± 0.08 , $p < 0.01$). Geranylation (GGPP 5 uM) or farnesylation (FPP10 uM) alone failed to inhibit simvastatin's effect on AII stimulation of ERK1/2 but the combination of both GGPP + FPP significantly overcome simvastatin's effect (0.479 ± 0.13 vs. 1.876 ± 0.39 , $p < 0.05$). **Conclusions.** These results suggest that activation of both isoprenoid pathways are involved in AII stimulation of ERK1/2 in VSMC. Furthermore, the effect of simvastatin on mitogen-activated protein kinase can be overcome by replenishing both geranylation and farnesylation pathways. The results indicate that the activity of the cholesterol biosynthetic pathway in VSMC plays an important role in vascular function.

Need for Investigational Drug Services at a Tertiary Community Hospital

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Introduction. Investigational drug services (IDS) include procurement, storage, dispensing, and disposal of investigational medications along with providing education, participating in research committees and maintaining protocol records. The investigational drug workload at our institution is expected to increase after increased participation in H. Lee Moffitt Cancer Center & Research Institute protocols and pursuit of teaching facility status. Our institution lacks formal IDS, with limitations of the current system causing missed opportunities for proper nursing education, miscommunication regarding investigational medications, and lack of organization to ensure all study medications are dispensed through the pharmacy as required by JCAHO. **Purpose.** To evaluate the amount of time currently dedicated to investigational drug pharmacy services. The current system effectiveness will be evaluated with protocol log audits for completeness. A secondary analysis will be conducted to determine the financial feasibility of accommodating a full time position through the budgeted pharmacy funds. **Methodology.** There will be three parts evaluated during this study. Prospective analysis of investigational pharmacist's additional workload from IDS will be performed via daily activity logs for three months. Retrospective audits of completeness of log records to assess the current system will be collected for the period of three months. Pharmacy budgets in protocols from the 2007 fiscal year will be evaluated. Descriptive statistics will be used to summarize data analyzed.

Hospital-wide Analysis of Preprinted Medication Order Sets at a Tertiary Community Hospital

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Objective. To standardize the process for using preprinted order sets which will enhance accurate communication, promote patient safety, and help to build the framework for future Computerized Physician Order Entry (CPOE) implementation. **Background.** A preprinted order set is a tool to assist the practitioner in choosing the most appropriate medical management of patients. They often accompany clinical practice guidelines and are recommended to reduce communication errors by targeting the ordering stage of medications, where most medication errors occur. They provide continuity of care, educate institutional personnel regarding evidence-based guidelines, increase compliance with Joint Commission on the Accreditation of Healthcare Organizations (JCAHO), and enhance workflow processes. Currently, many of the existing order sets belong to individual physicians and there is potential for little variation as different physicians may have similar order sets for a particular procedure or diagnosis. **Methods.** Preprinted order sets will be collected from all units of the hospital and scanned for duplicates. Each original will be analyzed using a data collection sheet that was developed based on The Institute for Safe Medication Practices (ISMP) and the USP Center for the Advancement of Patient Safety preprinted order set recommendations. Descriptive statistics will be used to summarize data and inferential statistics will be used to analyze the results according to "disease-specific" or "doctor-specific." Order sets that are found to contain inappropriate or duplicate information will be revised using an interdisciplinary approach. This standardization will decrease the risk of error that comes with multiple versions. **Results and Conclusion.** In progress.

Prevalence of Inaccurately Labeled Psychotropic Allergies Within a State Psychiatric Facility

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Background. The prevalence of true allergies to psychotropic medications remains unclear. One limiting factor in assessing this issue has been the historical practice of recording adverse drug reactions, such as an extrapyramidal side effect in the allergy section of a medical record. **Objective.** To determine the prevalence of documented allergies to psychotropics and the prevalence of inaccurately labeled allergies. **Methods.** This evaluation utilized a pharmacy database audit to review the allergies documented during January 2004 to January 2007. A sample group from those patients labeled with a psychotropic allergy was interviewed to determine and confirm the associated allergy. Attending psychiatrists and medical charts were consulted upon a patient's inability to complete the interview. **Results.** A review of pharmacy records revealed 134 patients (~10%) with 172 incidents of individually documented psychotropic allergies. Patient interviews determined that 93% (n = 25) of the sample population actually experienced an adverse drug reaction (ADR), and not a true allergic reaction. The remaining 7% (n = 2) declared a nonspecific dermatitis as the associated reaction, and could not be ruled out as a true allergic reaction. **Conclusion.** The prevalence of inaccurately labeled allergies to psychotropics was exceptionally high in the sample population. Potentially, 100% of the sample population experienced an adverse reaction when considering the widely documented dermatological reactions associated with many psychotropic medications. As a result, future therapeutic decision making could be inappropriately weighted and a potential pharmacological regimen may be disregarded due to the allergy label.

Clinically Relevant Safety Issues Associated with St. John's Wort Product Labels

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Background. St. John's wort (SJW) interacts with drugs including cyclosporine, indinavir, and warfarin. Healthcare professionals (HCPs) are often unaware of these interactions. The product label is one source of information and inclusion of interaction information on SJW labels is associated with more appropriate counseling being dispensed. **Objective.** To evaluate clinically relevant safety information on SJW product labels. **Methods.** Categories of label safety issues were established as: 1) drug interactions, 2) contraindications, 3) therapeutic duplication, and 4) general considerations. Evaluations of labels were performed. Descriptive statistics were used to summarize and Chi square and ANOVA were performed to detect a difference in product scores. A post-hoc Duncan test was

conducted to examine the data for differences in label scores between individual products. **Results.** The percentage of the 74 SJW products with label information present was: SJW-HIV (8.11%), SJW-immunosuppressants (5.45%), SJW-oral contraceptives (8.108%), SJW-warfarin (5.41%), bipolar (1.35%), antidepressants (22.97%), phototoxicity (51.35%), and consult HCP (87.84%). The mean number of safety warnings included on a product label was 1.84 (range 0-8). Both ANOVA ($p=0.005$) and Chi square ($p=0.008$) showed that differences existed between the label scores of SJW products. The post-hoc Duncan test revealed that the scores of three products were statistically superior in terms of completeness ($p=0.04$). **Conclusion.** The majority of SJW product labels inadequately address safety issues. A few products provide an acceptable amount of safety information, which could enhance the quality of counseling by HCPs. However, the greatest benefit may be if the FDA re-examined labeling requirements of dietary supplements.

Evaluation of Single Versus Combination Antipsychotic Treatment and Clinical Outcomes

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Background. The purpose of this evaluation was to determine if combination antipsychotic treatment (CAT) is superior to single antipsychotic treatment (SAT) in clinical outcomes as reflected by the Brief Psychiatric Rating Scale (BPRS), the Global Assessment of Functioning scale (GAF), and the Abnormal Involuntary Movement Scale (AIMS). **Methods.** This evaluation reviewed 329 active patient records in an inpatient psychiatric facility during December 2006. Data collected included: demographics; diagnoses; treatment regimens; adjunctive medications; BPRS, AIMS, and GAF scores. BPRS and AIMS scores were averaged and compared utilizing an unpaired, two-tailed t-test. GAF scores were obtained from admission records and at the time of this evaluation. Improvement within groups was evaluated via a paired, 2-tailed t-test. All confidence intervals were 0.95. **Results.** Three hundred ten patient records met inclusion criteria. Data showed statistically significant differences in mean BPRS-18 (34.90 vs. 36.36, $n=305$, $p=0.02$) and AIMS scores (1.53 vs. 0.68, $n=268$, $p=0.01$) among SAT versus CAT, respectively. Baseline GAF scores showed no significant difference (32.67 vs. 31.71, $n=300$, $p=0.32$) between SAT and CAT groups, respectively. Though both groups demonstrated improvement in GAF scores from baseline, no significant difference was found (34.91 vs. 34.91, $n=300$, $p=1$) between SAT and CAT groups, respectively, at the time of evaluation. **Conclusion.** Efficacy measures indicated statistical differences favoring SAT regimens over CAT regimens when groups were comparable at baseline. Interestingly, patients receiving CAT had significantly lower AIMS scores, suggesting no increase in occurrence of extrapyramidal symptoms. Further studies are required to clarify roles of these treatments in psychosis.

Angiotensin-II Actions and AT1-Receptors During Statin Withdrawal.

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Background. Acute discontinuation of statins induces vascular dysfunction and increases cardiovascular events. The mechanisms underlying these events are under investigation. Angiotensin II (All)-signaling is increased after acute statin withdrawal. **Objectives.** To investigate whether All-AT1-receptor expression (AT1-R mRNA) and receptor protein (AT1-R) levels mediate the increase in All signaling observed after statin withdrawal. **Methods and Results.** In rat aortic vascular smooth muscle cells (VSMC), simvastatin (0.3-3 μM for 24 hours) inhibited in a concentration-dependent manner All-stimulated phosphorylation of extracellular-signal regulated kinase 1/2 ERK1/2 ($-67\pm 5\%$ with 3 μM ; $P<0.001$), decreased AT1-R mRNA ($-34\pm 8\%$ with 3 μM ; $P<0.01$) and AT1-R protein ($-32\pm 6\%$ with 3 μM ; $P<0.01$). Removal of simvastatin, led to a rebound increase in mRNA-AT1-R ($+39\pm 2\%$, $P<0.01$), AT1-R protein ($+46\pm 2\%$; $P<0.01$) and All-mediated phosphorylation of ERK1/2 ($+36\pm 3\%$; $P<0.01$). The increase in receptor expression was present at 1 hr and lasted for 4 hours, whereas increased AT1-R protein and All-signaling started at 2 hours and lasted nearly for 2 hours. **Conclusions.** Increased All signaling after statin withdrawal is most likely due to increases in AT1-R number due to increased transcription. The increase in All activity may contribute to the vascular dysfunction associated with statin withdrawal.

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NOTES





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