J. Warren Perry Poster Day 2013

University at Buffalo
The State University of New York

School of Public Health & Health Professions
April 19, 2012
100 Allen Hall
South Campus
# POSTER PRESENTATIONS

100 Allen Hall  
2:00 – 4:00 p.m.

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ABSTRACTS

Biostatistics

High Gleason Prostate Cancer, Does Age Matter?

OBJECTIVES: For men with newly diagnosed prostate cancer, the heterogeneity of outcomes vary based upon stage, histological grade, and serum PSA levels. A higher Gleason score is indicative of an increased likelihood of having non-organ confined disease and a poorer outcome after treatment for localized disease. This institutional review aimed to examine predictors of outcomes in patients with high Gleason prostate cancer.

METHOD: Two similar cohorts of 38 patients diagnosed with high Gleason Prostate Cancer during 2004 and 2010, one above the age of 55 years and other below it were identified. Clinicopathologic information was documented for each patient. There were three critical time intervals in patients’ treatment period except the overall survival, time of PSA failure from definitive treatment, time from initiation of ADT to castration-resistant prostate cancer (CRPC), time to initiation of chemotherapy from initiation of ADT. Each of these three time intervals were considered as a covariate in the overall survival Proportional Hazard model. Also, effect of other factors (i.e., age, stage and etc.) on each of these time intervals was evaluated through a separate PH model.

RESULTS: Amongst all patients, OS was worse in patients with a shorter interval of time between definitive therapy and PSA failure (p < 0.001) and also those patients with a higher nadir PSA on ADT (p < 0.001). Additionally, nadir PSA on ADT had a significant effect on the time interval from ADT to CRPC (p < 0.001). Median PSA at diagnosis was higher in patients >55 years (29.8ng/dl versus 10.7ng/dl) as was nadir PSA on ADT (0.75ng/dl versus 0.47ng/dl).

CONCLUSIONS: This institutional review did not find a significant difference between age groups when stratified by the age cut off, 55. However, it showed Nadir PSA on ADT and time to PSA failure have significant effect on Overall Survival.

Lifetime Risk Estimators in Epidemiological Studies of Krabbe Disease: Review and Monte Carlo Comparison
A. Foss, BSOF, P. Duffner, MD, R. Carter, Ph.D

OBJECTIVES: This study addresses difficulties arising in estimating epidemiological parameters of leukodystrophies and lysosomal storage disorders, with special focus on Krabbe disease. Although multiple epidemiological studies of Krabbe disease have been published, these studies are difficult to reconcile since they have used different study populations and different estimation methods. Further confusion exists in the literature regarding which epidemiological parameters have been estimated.

METHOD: A literature review found 18 articles reporting 23 distinct parameter estimates. A Monte Carlo (MC) simulation study was conducted to calculate the bias and MSE of each of three distinct estimators we refer to as DOB, Dx, and Beiser estimators. The MC study was repeated 4320 times with distinct parameter settings chosen to encompass the range of possible study conditions based on the literature review.

RESULTS: The current review shows that most previous estimates can be properly interpreted as lifetime risk at birth, although some estimates are rendered uninterpretable due to flawed or inadequately described methods. Results of the MC study show that the DOB estimator is biased, while Dx and Beiser estimators are approximately unbiased.

CONCLUSIONS: Future studies should use clearly described methods and inclusion criteria to allow comparison across studies. We conclude that the Dx estimator should always be preferred over the DOB estimator. When possible, other estimators such as the Beiser estimator are most preferable since they can provide age-specific estimates. It is anticipated that these recommendations will be broadly ap-
 applicable to other rare diseases with infantile forms.

Community Health & Health Behavior

Comparing Educational Approaches for Reducing Pediatric Obesity

Alexander Ruch, Teresa Quattrin, MD, Michelle Ecker, RD, Christopher Barrick, PhD, and Gregory Homish, PhD

BACKGROUND: Pediatric obesity is a leading public health concern. Children spend large amounts of time at daycare centers, eating there several times per day. Improving daycare workers’ nutritional knowledge could help prevent obesity among children. This pilot study compares effectiveness between two forms of web-based technologies in enhancing knowledge of children’s nutritional needs among daycare workers working with children ages five and younger.

METHOD: Twelve locations of the same daycare organization were randomized into intervention and control conditions. At baseline, both conditions received identical questionnaires and information. The 24-item questionnaire contained four subscales: background of obesity, nutrition, serving sizes and frequencies, and BMI and growth charts. 216 participated (103 in control, and 113 in intervention), and all completed the questionnaire. Afterward, a basic website containing only links to other websites was provided to the control, while a version containing information, graphics, videos, interactive modules, and links was provided to the intervention. Afterward, a basic website containing only links to other websites was provided to the control, while a version containing information, graphics, videos, interactive modules, and links was provided to the intervention. One month after baseline, 83.3% (n = 180) of participants completed a follow-up questionnaire.

RESULTS: At follow-up, total scores for both groups increased from baseline (p < 0.001). Those in the intervention showed greater increases in background scores on obesity than control (p < 0.05). Increases were also found in nutrition (p < 0.001), serving (p < 0.001), and BMI and growth questions (p < 0.05); however, none of these improvements were dependent on condition.

CONCLUSIONS: Web-based technology is effective in increasing the nutrition-based knowledge. Future studies can focus on promoting use of technologies, and assessing their long-term effectiveness.

Comparing young adult physical activity levels to U.S. guidelines

Maribeth A. Insana, Paula C. Vincent, Sandy D. Wilson, R. Lorraine Collins, & Deborah Saltino

OBJECTIVES: The latest U.S. physical activity (PA) guidelines suggest that adults need at ≥ 150 minutes of moderate-intensity (2% of waking hours) and/or 75 minutes (1% of waking hours) of vigorous-intensity aerobic PA weekly. In 2010, only 39% of young adults (ages 18-24) met these guidelines. Thus, most young adults do not get a minimal level of exercise and are at risk for sedentary lifestyles and chronic diseases (e.g., diabetes) in later adulthood. We assessed PA for a sample of young adults using both self-report and objective (accelerometer) methods.

METHOD: Participants were 106 young adults (ages 18-25; 37% female; 41% minority; Mean BMI = 24.09) for a study of marijuana use and PA. On questionnaires, participants reported the number of hours they spent engaging in moderate or vigorous PA during a typical week. Participants also wore ActiGraph GT3X triaxial accelerometers for at least 2 weeks. From accelerometer data, we computed % time engaging in light, moderate, and vigorous intensity PA.

RESULTS: The majority (84%) of participants self-reported ≥150 minutes of moderate and/or vigorous PA/week, exceeding minimum federal guidelines. Accelerometer data indicated that participants spent 92% of their time in light-intensity, 7% of their time in moderate-intensity, and 1% of their time in vigorous-intensity PA.

CONCLUSIONS: Accelerometer reports revealed that participants exceeded U.S. guidelines for moderate-intensity PA, but just met guidelines for vigorous-intensity PA. However, in order to improve physical fitness, reduce risk of chronic disease, and prevent weight gain associated with increased age, young adults should strive to exceed minimum federal guidelines.
Defining “hard-core” smoking in the United States: A cohort analysis

Megan L. Saddleson, M.A., Gary A. Giovino, Ph.D., Gregory G. Homish, Ph.D., Marc T. Kiviniemi, Ph.D.

OBJECTIVES: Considerable debate exists in the tobacco control community regarding whether the remaining population of smokers in the United States is “hardening,” or becoming more addicted. Definitions of “hard core” smoking (HCS) offered to date have been based on cross-sectional surveys. We sought to better specify HCS by incorporating criteria for measuring and defining HCS based on conceptual models and data from a cohort analysis.

METHOD: The Assessing Hard-Core Smoking Survey collected data on 751 adult (ages≥25 years) baseline cigarette smokers who responded to a national random-digit-dialed survey and completed a 14-month follow up interview (baseline response rate=45.7%; follow up completion rate=75.1%). Potential predictors included demographics, indicators of cigarette dependence, motivation to quit, quitting history, intention to quit, self-efficacy, relevant co-morbidities, and attitudes/feelings about smoking. The dependent variable was defined as being abstinent from cigarettes and other tobacco products for at least 30 days.

RESULTS: Multivariable analyses found that three factors best predicted abstinence: low dependence on the Heaviness of Smoking Index (RR=8.11, p<0.001), concern that smoking might shorten one’s life or that smoking might affect the health of others (RR=3.95, p=0.043), and not considering smoking as one’s main source of pleasure (RR=2.76, p=0.019). Additionally, serious psychological distress (as measured by Kessler’s K6 items) and binge drinking were negatively associated with cessation.

CONCLUSIONS: Dependence, motivation and comorbidity are consistent with commentaries that view HCS as compromising a person’s willingness and ability to quit. A measure of smoking as one’s main source of pleasure is also relevant to this definition.

Evaluation of a worksite health promotion intervention to improve fruit and vegetable consumption and physical activity

Jeffrey P. Haibach, MPH and Gary A. Giovino, PhD, MS

OBJECTIVES: This study was designed to evaluate the potential effectiveness of a worksite health promotion intervention designed to improve fruit and vegetable consumption (FVC) and physical activity. It is offered publicly at no significant cost by an independent grocery corporation.

METHOD: We surveyed employees at 6 worksites where the program was offered, immediately before, immediately following, and six months after the 8-week intervention. Non-participants who provided survey data were the comparison group. Participants in the program also reported [online] the number of cups of fruits & vegetables consumed and steps walked (or equivalents).

RESULTS: According to survey data, FVC increased short-term in the intervention group by 1.1 times/day and .7 servings/day (n=39; p<.05). At six-month follow-up, intervention participants returned to pre-test levels of FVC. No changes in FVC were observed in the comparison group (n=35; p>.05). According to on-line data reported by 262 program participants, FVC did not increase during the intervention (p>.05). According to survey data, there were no significant changes in moderate or vigorous physical activity (p>.05). The on-line data, however, showed a significant increase in daily physical activity of, on average, 165 steps/week (n=288; p<.001).

CONCLUSIONS: The survey data were limited by low participation rates. The on-line data were limited because participants might have already increased their FVC and steps taken during Week 1. If FVC did increase, the effect appears to have been short-term. There might have been a training effect for physical activity. More rigorous evaluation studies are needed.
Growing Healthy Together: An example of how a community-hospital-university partnership can mobilize communities toward healthy environments and lifestyles


OBJECTIVES: A partnership between community members, a hospital, and the University at Buffalo was established to advance grassroots efforts to affect social determinants of health in a predominantly black, low-income neighborhood.

METHOD: First, students and community members conducted a survey of health concerns and assets and barriers that impact health. Respondents were recruited via door-to-door canvassing and through social networks. Of ≈500 eligible households, 457 were attempted, 174 adults were approached, and 79 completed the survey.

RESULTS: Respondents had higher than state average rates of preventable chronic diseases including hypertension (56%), diabetes (15%), and asthma (28%). The survey was an opportunity for health education; participants were offered health promotion information after the interview. Second, survey results were presented to the community at a priority setting meeting access to healthy foods was identified as the top concern. Assessed at this meeting baseline trust in the university was low (mean=3.4/5), indicating that sustained and equitable engagement producing community improvements will be necessary to reverse negative perceptions. Third, survey results were presented at stakeholder meetings. Deliverables include a vital community-hospital-university partnership; a lay brochure describing the community’s health status, assets and barriers combined with health information; an executive summary of survey results for leveraging support from business and political leaders; and increased community mobilization and stakeholder commitment as evidenced by attendance at meetings.

CONCLUSIONS: Student leadership, frequent interaction, and community agenda setting strengthened the mutually-beneficial collaboration and re-energized the community’s change process.

Information-seeking in a clinical setting: participant-observation data

Susan A. LaValley, MA, MLS

OBJECTIVES: Existing literature identifies online health information-seeking as prevalent behavior, both in the general population and the cancer population (Fox 2011, Kim & Kwon 2010). Between the two groups, cancer patients engage in this behavior less often than non-cancer patients, and are less likely to report this behavior to their providers. This study’s goal was to capture real-time, nuanced manifestations of this information-seeking behavior.

METHOD: A clinic that self-identified as seeing patients who engage in online health information seeking agreed to participate. A total of sixteen hours shadowing multiple levels of providers (MD’s, NP’s, PA’s) captured 13 oncology patient-provider interactions, in addition to informal interviews with providers. Data collection via participant-observation was conducted to examine how and if this behavior manifested in clinical interactions. An open coding scheme of the field notes resulted in the identification of themes in patient-provider communication.

RESULTS: 100% of patients and providers agreed to be observed. Although there were no observations of patients overtly introducing external information into the clinical encounter, 77% asked questions about drug regimens or requested clarification of drug information.

CONCLUSIONS: Patient information-seeking behaviors do not necessarily present as expected, suggesting patients might use less overt strategies for integrating external information into the clinical encounter. Although related, the processes of question-asking and information-seeking might be better understood as separate pursuits. These processes may be influenced by factors such as: the pre-existing patient-provider relationship, the severity of illness, and overall health literacy skills, including a patient’s ability to identify high quality informational resources.
**Motives for Marijuana Use and Problems Among Young Adults**

Sandy D. Wilson, Paula C. Vincent, Maribeth A. Insana, R. Lorraine Collins, & Deborah Saltino

**OBJECTIVES**: Marijuana (MJ) is the most commonly used illicit drug in the U.S. The percentage of young adult MJ users has increased from 16.6% (2008) to 19.0% (2011). Understanding the relationship between MJ motives, use, and problems is necessary for effective secondary prevention.

**METHOD**: Participants were 106 young adult (ages 18-25) regular MJ users (37% female; 41% minority), with no history of substance use treatment or problems, recruited through newspaper ads and flyers. We used the Comprehensive Marijuana Motives Questionnaire to assess reasons MJ use, the Timeline Followback calendar to assess past 30-day quantity and frequency (Q+F) of MJ use, and the Marijuana Problems Index (MPI) to assess MJ problems.

**RESULTS**: Participants were frequent MJ users: $M = 23.81$ ($SD = 5.84$) MJ use days/past month. They cited enjoyment, celebration, relative low risk, and boredom as their top reasons for MJ use. We predicted that key MJ motives (e.g., coping) would be related to MJ problems, above and beyond current MJ use. We ran hierarchical regressions, entering demographics at Step 1, past 30-day Q+F of MJ at Step 2, and 5 MJ motives at Step 3. After the covariates, coping ($\beta = .25$, $p < .05$), alcohol (e.g., $\beta = .28$, $p < .01$), and social anxiety ($\beta = .23$, $p < .05$) motives were uniquely related to MJ problems.

**CONCLUSIONS**: With increasing acceptance of MJ use and its recent legalization, it is important for public health practitioners to identify motives for MJ use to help inform development of effective prevention and intervention programs.

Participants in malaria education program are more likely to report bed net use and perceived more benefits and less problems with nets

Teresa Semalulu, Heather Orom, Jessie Stone

**BACKGROUND**: The global burden of malaria is substantial, Uganda alone has an estimated 12.8 million annual cases of malaria and 47,000 deaths. Long Lasting Insecticidal Nets (LLINs) are the most effective means of preventing malaria. Initiatives exist to improve LLIN utilization, but often are not evaluated. We evaluated a single-session malaria education program delivered by community health workers from a non-governmental community clinic in South-eastern Uganda. The program educates villagers about causes of malaria, treatments, benefits of and proper use of LLINs and provide nets at a subsidized rate.

**METHOD**: We compared malaria related knowledge, attitudes, self-reported health care seeking and LLIN usage by program participants surveyed post-intervention (n=269) and a convenience sample of local non-participants (n=138).

**RESULTS**: Compared to controls, participants in the education program were more likely to report having household members and children sleeping under LLINs, to know that mosquitoes cause malaria and perceive more benefits and less problems with nets. However, participants reported lower odds of having recent cases tested and there were no significant differences in knowledge about malaria symptoms and treatments.

**DISCUSSION**: Although preliminary, results indicate that a brief community-lead malaria education program can be effective at improving attitudes toward LLINs and LLIN usage. The unexpected findings indicate that there may be many barriers to following health care recommendations and educating people on this topic may be more challenging than promoting LLIN usage.

Reactions to Waterpipe Smoking and Associated Advertising of Waterpipe Venues

Jessica A. Kulak, MPH, MS, Mark J. Travers, Ph.D., Maansi Bansal-Travers, Ph.D.

**OBJECTIVES**: Relatively little is known about the use behaviors of hookah smokers. This qualitative project sought to assess the participants’ reactions to an emerging tobacco product and the methods that are used in advertising hookah smoking venues.
METHOD: Small focus group discussions were used to allow a natural dialogue to develop between participants (n=15; mean age = 22.5 (range 18-26 years)) as they viewed a hookah and related materials. The conversation was semi-structured, using questions from a discussion guide.

RESULTS: Hookah users deviate from the traditional shisha-charcoal-water trio that is most commonly associated with hookah use, in that they have reported using flavored beverages, alcoholic beverages, milk, and/or ice in the hookah base. Various activities associated with hookah smoking, such as blowing smoke bubbles and smoke rings, were cited as an important aspect in hookah use. Most reported smoking at a commercial waterpipe café. Participants rarely reported interacting with these establishments over social media but rather cited the importance of the location of a hookah smoking establishment and hearing about hookah cafés by word of mouth.

CONCLUSIONS: These focus groups have produced important insights about how the public engages with hookah and reacts to the marketing efforts of waterpipe venues. Experimenting with different ways to smoke hookah was attractive to this group and the hookah café itself seems to be a vector for use. As waterpipe products and smoking are only loosely regulated, the insights gained from these focus groups will be useful in informing future public health policies.

Exercise and Nutrition Sciences

An EMG driven musculoskeletal model for determining how muscles contribute to joint stability

Moumita Ray Choudhury, Jeffery T. Podaza PT, MS, OCS, Scott C. White PhD

OBJECTIVES: Joint stability is provided by muscles to prevent cartilage and ligament injury. Determining how individual muscles coordinate to stabilize a joint is a classic biomechanics problem. Electromyographic (EMG) co-contraction indices are used to represent muscle coordination; however, few investigators incorporate muscle morphology and geometric factors. We present a lower limb musculoskeletal model incorporating muscle physiological cross-sectional area (PCSA) and moment arm (MA) for use with EMG measures.

METHOD: Muscle PCSA and MA from the literature were combined to determine contribution ratios for muscles crossing the knee and ankle. Surface EMG using Motion Labs Inc. preamplified electrodes over lateral and medial Gastrocnemius and Soleus for a pilot subject were collected for ankle plantarflexion calibrations and validation trials using a Cybex dynamometer. EMG-to-torque ratios utilizing the musculoskeletal model were calculated based on maximal effort contractions. Predicted torques based on the model and EMG records were compared to measured torques.

RESULTS: Ankle torque values matched measured torques for an isometric contraction at increasing levels of activation (r² = 0.987); the root mean square difference (RMS_diff) was less than 5%. The RMS_diff for a submaximal (~ 25%) concentric isokinetic trial was about 20% near the peak.

CONCLUSIONS: This modeling approach shows how the contribution of synergistic muscles can be separated based on activation, size and MA. The model will be extended to include muscle length and moment arm changes with joint angle changes. The goal is to determine the individual contribution of lower limb muscles to knee joint stabilization.

Caffeine Increases Liking and Consumption of Novel-Flavored Yogurt

Leah M. Panek, MS, Christine Swoboda, MS, Ashley Bendlin, Jennifer L. Temple, PhD

OBJECTIVES: The purpose of the current experiment was to test the hypothesis that a caffeinated beverage paired with a novel flavored yogurt will increase preference for that yogurt compared to one paired with placebo. We also tested the hypothesis that liking would increase more when caffeine was paired with high energy density yogurt.

METHOD: Men and women (n=62) were randomized to receive a beverage containing placebo (PLA) or caffeine (CAF) and to consume a low (LED) or high energy density
(HED), novel flavored yogurt. Participants rated, ranked, and consumed seven novel flavored yogurts and then had a target yogurt paired with either PLA or CAF over four consecutive days.

**RESULTS:** In general, yogurt liking increased over time, the HED yogurt was liked more than the LED yogurt, and yogurt paired with caffeine was liked more than yogurt paired with placebo. Participants showed a significant increase in liking of LED yogurt paired with caffeine compared to those with LED yogurt paired with placebo.

**CONCLUSIONS:** Caffeine administration may increase liking and consumption of novel flavored foods, particularly if the food is not highly liked at baseline. This suggests that caffeine-pairing may be a way to increase liking of LED foods, such as vegetables and fruit.

**Is GABAergic Ventilatory Control Mechanism Altered in Duchenne Muscular Dystrophy?**

Milind Chaudhari, Kunjan Shah, Gaspar Farkas

**OBJECTIVES:** Duchene Muscular Dystrophy (DMD) results from the lack of dystrophin, a structural protein associated with clustering of GABA receptors at post-synaptic neural membranes. Absence of dystrophin is linked to altered GABA function in various cortical areas associated with neurocognitive pathways. Whether lack of dystrophin alters GABAergic ventilatory control in DMD is unknown. Therefore, we investigated if functions of GABA<sub>A</sub> and GABA<sub>B</sub> receptors are preserved in mdx mouse, a murine model of DMD.

**METHOD:** Ventilatory parameters (frequency, tidal volume, and minute ventilation) in 8 mdx and 9 control wild-type mice were measured at rest, after 5 min of hypoxia (10% O<sub>2</sub>) and after 5 min of hypercapnea (4% CO<sub>2</sub>) using barometric plethysmography. Studies were repeated on three separate occasions (72-hours between tests) following random subcutaneous injection of either Bicuculline (selective GABA<sub>A</sub> antagonist, 0.5mg/kg), Phaclofen (selective GABA<sub>B</sub> antagonist, 1mg/kg) or DMSO (vehicle).

**RESULTS:** With Phaclofen, mdx mice had significantly higher tidal volumes compared to control mice during all gas exposures (room air, hypoxia and hypercapnea). Minute ventilation was significantly higher in mdx mice compared to control mice during hypoxia. Bicuculline did not show any significant differences between the mdx and control values except the tidal volume of mdx being higher than control mice when exposed to hypercapnea.

**CONCLUSIONS:** We conclude that GABAergic ventilatory control mediated by GABA<sub>A</sub> is altered in young mdx mice; whereas GABA<sub>B</sub> receptor mediated ventilatory control seems to be intact. Therefore, pharmacological interventions targeting CNS control of breathing can help in preventing respiratory dysfunction in DMD patients.

**The Effect of Vitamin D Status on Various Measures of Physical Performance of Collegiate-age Athletes**

Donald Joyce, Brian Williams, Harry Marsales, Zach LaMacchia, Peter Horvath

**OBJECTIVES:** Vitamin D is a concern for individuals who live at higher latitudes due to seasonality of sun exposure and intensity. Previous studies have shown that poor vitamin D status is associated with muscle weakness in test animals and the elderly. Supplementation has been shown to reverse vitamin D associated muscle weakness. Studies suggest that athletes are at risk of developing poor vitamin D status and thus may be at risk of skeletal muscle weakness.

**METHOD:** 25 subjects from the Buffalo, NY area were screened for cardiovascular disease risk and entry requirements (Serum 25(OH) Vitamin D between 10-30ng/mL and VO<sub>2</sub>max in the upper 50<sup>th</sup> percentile). 13 subjects were enrolled in a double blind, placebo controlled parallel arm design with 4 visits. Each test visits consisted of Vertical Jump, Wingate, 3RM Bench Press, and 5x6sec Repeated Sprint tests. After visit 2, subjects received either a 60,000IU dose of vitamin D (n=7) or placebo (n=6). Serum vitamin D and calcium were measured throughout for safety.

**RESULTS:** 12 subjects completed all of the visits (1 subject withdrew due to scheduling conflicts). Vitamin D status rose in significantly in the test group (9ng/mL), while the control group saw no significant change. A Two Way
Repeated Measures ANOVA showed that there was no effect after supplementation on any of the measures of physical performance (p>0.05).

**CONCLUSIONS**: Our findings suggest that there may be no effect of vitamin D on skeletal muscle function in young, healthy individuals.

**The Effects of Changing Stride Length on Vertical Ground Reaction Forces**

**Alyssa Herman, Dan Gaile, and Scott White**

**OBJECTIVES**: In recent literature on running biomechanics a great deal of focus has been placed on footstrike and the effects it has on vertical ground reaction forces. Components of vertical ground reaction forces have been linked to injury. This study aimed to identify other factors that influence vertical ground reaction forces, specifically stride length.

**METHOD**: Vertical ground reaction forces were captured for eighteen subjects running on a treadmill. Subjects chose a speed typically used on a long, easy run and ran at that speed for 3 conditions. The first condition was considered the subject’s “natural” cadence and stride length. The second was run at a cadence 15 steps per minute faster; the third was run at a cadence 15 steps per minute slower. Running at a constant speed but changing cadence changes stride length. A full mixed model included a fixed effect for cadence and random effects for subject and replicate variability was fit for each response variable. The statistical significance of the fixed effect for cadence was tested via the comparison of the log-likelihood of the full model to a reduced model that omitted the cadence variable. Model based contrasts among cadence levels were also estimated and tested using the lme4 and gmodel R libraries.

**RESULTS**: All four response variables varied with cadence in a way that was statistically significant (at a level of 0.05). The decrease in jerk impact values and the increase in jerk active values as cadence was increased from low to normal, were statistically significant. The increase in jerk impact and active values and the decrease in force impact and active values as cadence was increased from normal to high, were statistically significant

**CONCLUSIONS**: Stride lengths longer and shorter than normal tend to increase rates of rise of force for both types of runners, suggesting that studies reporting less “potential” injury with barefoot running need to consider stride length a compounding factor affecting their results.

**Vitamin D Modulation of Diaphragm Muscle Strength in Mice**

**Andrew D. Ray, Kirkwood J. Personius, Matthew Bancone and Pamela A. Hershberger**

**OBJECTIVES**: Recent data provides evidence for an important role of vitamin (Vit) D in respiratory muscle health. We tested the hypothesis that Vit D deficiency will reduce diaphragm muscle strength.

**METHOD**: Fifteen A/J mice were exposed to diets containing either 100 IU/kg Vit D₃ (deficient diet), 1,000 IU/kg (reference diet), or 10,000 IU/kg (supplemented diet) (n=5/group) for eight weeks. At the end of the 8 weeks, plasma Vit D and diaphragm and EDL muscle in-vitro contractile properties were measured.

**RESULTS**: Mice fed the deficient, reference and supplemented diets had plasma 25(OH)D₃ levels equal to 7, 21, and 59 ng/mL respectively. Calcium levels remained stable. Diaphragm force was significantly weaker (25%) in Vit D deficient mice compared to mice from either of the Vit D replete groups (p < 0.05). Diaphragm fiber diameter was also reduced in Vit D deficient mice compared to the reference and supplemented groups 684±293µ², 769±297µ² and 753±304µ², respectively (p<0.001). There were no changes in EDL muscle force.

**CONCLUSIONS**: These data suggest a critical threshold for Vit D levels with respect to diaphragm force production, because supplementation (59 ng/ml) does not offer an apparent performance enhancing effect beyond 20 ng/mL. These data also establish that diaphragm muscle responds differently to Vit D deficiency compared to peripheral muscle (EDL).
Rehabilitation Sciences

Does the Type of Simulated Patient (Mannequin vs Role Player) Impact Acquisition of Knowledge, Confidence, and Self-Efficacy in a Simulated Critical Care Rehabilitation Experience?

Kimberly Attwood, Eric Riesdorph, Rene Rivera, Raoul Roces, and Patricia J Ohtake

OBJECTIVES: Rehabilitation, including ambulation, of patients with critical illness is associated with decreased intensive care unit (ICU) and hospital lengths of stay and improved physical function and quality of life. To meet emerging demands for physical therapists to provide ICU rehabilitation interventions, management of critically ill patients is an important component of physical therapist students’ academic preparation. Simulation is an ideal learning environment because it provides low risk opportunities to develop clinical skills in high risk settings. However, mannequins are inanimate, limiting the realism of rehabilitation interventions. The purpose of our study was to examine the impact of the type of simulated patient (mannequin vs role player) on physical therapist student acquisition of knowledge, confidence, and self-efficacy following a simulated critical care rehabilitation experience.

METHOD: Students (n=45) were randomized to identical critical care simulation experiences in the Behling Simulation Center where the patient was either a mannequin or role player. Pairs of students engaged in the simulation experience followed by facilitated debriefing. Knowledge, confidence, and self-efficacy were assessed before and after the simulation experience.

RESULTS: Students in both groups scored well on the knowledge tests, reported average confidence for technical, behavioral, and cognitive skills required for managing patients with critical illness, agreed simulation experience improved their self-efficacy, and expressed high satisfaction with simulation as a method of learning. No group differences were observed.

CONCLUSIONS: In a simulated critical care rehabilitation intervention, both mannequin and role player simulated patients are associated with acquisition of physical therapist student knowledge, confidence, and self-efficacy.

Prediction of Older Adults' Discharge Destination from Sub-acute Facilities

Parul Manocha, Machiko R. Tomita, Ph.D., Suzanne Neely, OTR/L, Susan Nochajski, Ph.D., OTR/L, Bruce Naughton, MD

OBJECTIVES: A shortened rehabilitation period and the increasing choices that older patients can make after completing rehabilitation have created needs for examining current discharge guideline. Our aim was to predict eight discharge destinations (home with no care, home with some care, Sr. apartment, assisted living facility (ALF), long term care (LTC), home with 24 hour care, rehospitalization, and expired) at admission.

METHOD: At admission, data on functional status measured by the Barthel Index (BI), cognition by the Six Word Recall (6WR), age and diagnosis of 740 older patients (age ≥ 60) in three sub-acute facilities were collected. Predictions consisted of three steps: first, one-way ANOVA with classification based on homogeneous sets leading to 3 categories, second, cluster analyses resulting in another 3 categories, and finally, comparisons of these competing categories, using classification accuracy in logistic regression.

RESULTS: Three distinct destination categories emerged: (a) Home with no care, home with some care and Sr. apartment (high physical and cognitive function); (b) ALF (high physical and low cognitive function); and (c) The rest (low physical and cognitive function). Classification accuracy ranged from 68.6%-81.2%. Specific cutoff points were identified (e.g. all people who were discharged home without care scored 4 or more on the 6WR).

CONCLUSIONS: The current guideline stating older patients scoring 40 and lower in BI at admission will be discharged home is obsolete. Predicting more categories with higher accuracy is necessary including data for availability of a caregiver, gender, income, and patients' willingness become available to meet the demand.
The Effect of Instrument Assisted Augmented Soft Tissue Mobilization (IAASTM) on Iliotibial Band Tightness and Knee Pain in Recreational Runners

Carrie Caruso, Matt Sonricker, Bryan Hoffman, Kevin Smith, Nick Aldrich, Kevin Mark, Juli Wylegala, PT, PhD, and Andrew D. Ray, PT, PhD

OBJECTIVES: Iliotibial band (ITB) tightness is a common running injury responsible for knee pain. We examined the effectiveness of using IAASTM compared to usual care, to lengthen the ITB and reduce knee pain in recreational runners.

METHOD: Seven recreational runners (≥ 15 miles/wk) were randomly assigned to a CTRL (usual care, n=3) or Intervention group (INT; CTRL + IAASTM, n=4). Both groups received 8 treatment sessions over four weeks (2/wk, 45 min/ea). The CTRL group received 10 min of cross-friction massage along with lower extremity stretching and strengthening. The INT group also received 10 min of IAASTM plus usual care. Self-reported pain pre/during/after a run and Ober’s Test (ITB length) were measured at baseline and post-4 weeks of rehabilitation.

RESULTS: Pain after running was significantly reduced 82 ± 24% and 6 ± 49% in the INT and CTRL groups, respectively (p=0.005). There were no changes in Ober’s test for either group; however, passive hip adduction improved 44 ± 15% vs. -9 ± 34% in the INT and CTRL groups, respectively (p=0.048).

CONCLUSION: Although the study failed to show that IAASTM was superior in lengthening the ITB, it was more effective in reducing knee pain associated with running. Because passive hip adduction was improved in the INT group, this demonstrates that the lateral structures of the leg were more relaxed following treatment with IAASTM. We suggest that IAASTM is a more effective technique compared to cross-frictional massage to reduce knee pain associated with ITB tightness and running.

The effects of tactile input on joint proprioception

V. Myrthil, L. Zhu and J. Langan

OBJECTIVES: Proprioception, knowing one’s body position without the use of vision, is an important component of coordinated movements. Our study examines proprioceptive accuracy at the shoulder and elbow joint during arm movements with and without tactile input from an examiner. Better understanding how tactile input influences proprioceptive acuity can assist in developing more effective therapeutic interventions.

METHOD: 29 older adults (ages 65-86) were recruited. Participants were seated and blindfolded, a 3D motion monitor recorded arm movements. A trial started with the arm held straight by their side in line with the trunk. Participants were asked to flex their shoulder or elbow under 3 different conditions: 1) Examiner used tactile guidance to move the joint to the target angle, either 70 or 110 degrees (Active Assistive (AA)). 2) Examiner gave a tactile cue on the forearm when the target angle was reached, either 70 or 110 degrees (Target Set (TS)). 3) Participant independently flexed to the target angle of their choice (Fully Active (FA)). The participant returned their arm to the start position and then attempted to match the target angle. Amount of error was calculated by subtracting the target angle from the matching angle.

RESULTS: Participants were most accurate in matching the target angle in the FA condition, compared to either the TS or AA conditions.

CONCLUSIONS: Results suggest tactile input when guiding or correcting a person’s movement may interfere with their proprioceptive abilities. This information should be noted by rehabilitation practitioners when they are deciding on their therapeutic techniques.

The impact of pediatric acute-onset neuropsychiatric syndrome exacerbations on daily functioning

Sutanuka Bhattachariya, MS

OBJECTIVES: This study sought to determine functional limitations in children with Pediatric Autoimmune Neuropsychiatric Disorder Associated with Streptococcal infections (PANDAS) and Pediatric Infection-
Triggered Autoimmune Neuropsychiatric Disorder (PITAND) during and after exacerbation, along with frequency of occupational therapy (OT) intervention, and impact of OT on return to baseline post-exacerbation.

**METHOD:** Parents of 111 affected children completed a retrospective online survey based on the OT Practice Framework II. Wilcoxon signed-ranks test was used to determine whether there was a difference between baseline and post-exacerbation functioning, and Chi-square was used to determine if receiving OT services had an association with returning to baseline functioning.

**RESULTS:** Problems during exacerbation were reported in all 18 areas of daily living, and all 17 body functions and performance skills. Few of these returned to baseline post-exacerbation. Few children received OT services. No significant association was noted between receiving OT services in the past and return to baseline.

**CONCLUSIONS:** The impact of PANDAS/PITAND/PANS may be more pervasive than previously identified, and baseline function may not return post-exacerbation. Future research should identify best-practice for OT during and after exacerbation.

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Social and Preventive Medicine

**Admission FIM® total is a significant predictor of developing a new or worsened pressure ulcer among spinal cord injury (SCI) patients seen in inpatient rehabilitation facilities**

Margaret A. DiVita, MS, Carl V. Granger, MD, Randy Carter, PhD, Jo L. Freudenheim, PhD

**OBJECTIVES:** To determine whether admission FIM® total is predictive of developing a new or worsened pressure ulcer among spinal cord injury (SCI) patients seen in inpatient rehabilitation facilities (IRFs).

**METHOD:** We conducted a retrospective cohort study using the Uniform Data System for Medical Rehabilitation regarding SCI cases discharged from October 2008 to September 2011 who had information on pressure ulcer status. Patients with no pressure ulcers (13,235) were compared to patients with a new or worsened pressure ulcer (353). Logistic regression was used to estimate odds ratios (OR) and 95% confidence intervals (CI) for odds of developing a new or worsened pressure ulcer; data was taken from the Patient Assessment Instrument for IRFs, which includes the FIM® instrument, comorbidities, mobility status, and demographic information.

**RESULTS:** Compared to patients with an admission FIM® total of ≥ 80, patients with admission FIM® of 37 to 79 had a four times increased adjusted odds of developing a new or worsened pressure ulcer (OR = 4.26, CI 2.2 – 8.4); patients with an admission FIM® total of ≤ 36 had a six times increased adjusted odds (OR = 6.02, CI 2.7 – 13.5). Length of stay (LOS), admission setting, diabetes, and mobility status were also associated with development of ulcers. There was a significant interaction between LOS and admission FIM® total.

**CONCLUSIONS:** Even when adjusting for other predictors of developing a new or worsened pressure ulcer, admission FIM® total remained a predictor in a multivariable model among SCI patients seen in IRFs. Beginning in October 2012, collecting data on new or worsened pressure ulcers will be a mandatory quality measure in IRFs; the results of this study show that functional status at admission can be useful in identifying those at greater risk of developing new or worsened pressure ulcers in SCI patients.

Attitudes, Experiences, and Acceptance of Smoke-Free Policies in Multi-Unit Housing Establishments: A National Study of Multi-Unit Housing Operators and Residents

Andrea S. Licht, MS, Brian A. King, PhD, MPH, Mark J. Travers, PhD, Cheryl Rivard, MPH, & Andrew J. Hyland, PhD

**OBJECTIVES:** Secondhand smoke (SHS) transfers between units in multi-unit housing (MUH), potentially mitigating the effectiveness of personal smoke-free home policies. We examined attitudes and experiences related to smoke-free policies in MUH among a national sample of residents and operators.
**METHOD:** A cross-sectional, nationally representative sample of MUH operators (n=347) were interviewed via mail-based questionnaires with telephone follow-up. MUH residents (n=418) were interviewed through random digit dialing of landline and cell phones. Univariate statistics and binary logistic regression modeling assessed predictors of each outcome.

**RESULTS:** Most MUH residents (79%) reported having voluntary smoke-free home policies; 30% of all residents report living in smoke-free buildings. Among MUH residents with smoke-free home policies (n=339), 42% experienced a SHS incursion in their home within the past year. Support for smoke-free building policies was high among all residents (56%). Among Operators who reported “any” smoking restrictions (n=191), 42% managed at least one smoke-free unit and 36% had at least one smoke-free building. Among those who specifically did not manage smoke-free units (n=267), 38% were somewhat or very interested in implementing smoking restrictions in individual units. Major barriers cited to smoke-free policy implementation include higher vacancy rates and decreased market base. However, 81% of operators with smoke-free units cited no difficulties in renting them.

**CONCLUSIONS:** In spite of widespread adoption of voluntary smoke-free home policies, MUH residents are not fully protected from SHS. Educational interventions may encourage MUH operators to implement smoke-free building policies by decreasing barriers and highlighting the value of such policies in MUH.

**Burnout and health-promoting behavior among resident physicians in Buffalo, NY**

Imran Ahmad, MD, Rashmi Bismark, MD, Tyler B. Evans, MD, MPH, Carl Li, MD, MPH, Michael Noe, MD, MPH, Susan Orrange, EdM, Michael Leiter, MD

**BACKGROUND/RATIONALE:**
- A recently published national study (n=7288) showed that 45.8% of all practicing physicians in the US were experiencing at least one symptom of burnout.
- Studies of medical residents have yielded similar results; prevalence of resident burnout has varied widely from 18-82%.

**OBJECTIVES:**
1. To assess and compare the prevalence of burnout and health-promoting behavior among all residency disciplines pursuing their first board certification at the State University of NY (SUNY) University at Buffalo (UB).
2. To explore potential differences in the prevalence and odds of burnout by selected independent variables among IMG and North American medical graduate residents at SUNY UB.

**METHOD:**
- **Design:** Cross-sectional survey study
- **Study Population:** 643 residents.
- **Evaluation Instrument:** An electronic questionnaire designed with three main assessment components: (1) resident demographics; (2) knowledge, attitudes, beliefs and practices (KABP) with regards to health-promoting behavior and prevention; and (3) the Maslach Burnout Inventory (MBI) – General Survey (MBI-GS)
- **Variables of Interest:** Independent variables assessed included residency specialty of training, post-graduate year (PGY), place of medical education (AMG vs. IMG), gender, and various health-related attitudes/beliefs and personal practices. The dependent variable of interest was burnout as assessed by the MBI-GS. For univariate and multivariate analyses, burnout was defined as medium-high scores in the EE component of the MBI-GS.

**RESULTS/DISCUSSION:**
- 70.6% of residents are experiencing manifestations of burnout.
- PGY1 residents were at 3.34 higher odds of burnout than >PGY3.
- Family medicine and OB/GYN reported the highest levels of burnout.
- Consistent with prior studies showing differences in burnout between foreign and US medical graduates, IMGs have a 71% lower likelihood of burnout.
Complementary and Alternative Medicine Utilization Among Patients with Lung Cancer

Rashmi Bismark, M.D., Hongbin Chen, M.D., Ph.D, Grace Dy, M.D., and Martin Mahoney, M.D., Ph.D.

OBJECTIVES: Complementary and Alternative Medicine (CAM) use has been increasing among cancer patients in the US and globally. Estimates of utilization rates in the oncology population vary, ranging from 32-91%. Due to a paucity of information surrounding CAM use among patients with lung cancer, this study aimed to characterize the use of various types of CAM in this population.

METHOD: This cross sectional study was conducted among adult patients with diagnosed lung cancer, receiving care at Roswell Park Cancer Institute. 155 patients were consented and 108 (70%) completed a 40-item standardized survey tool to assess CAM use. The primary outcome variable was self-reported use of CAM, defined as the utilization of any type of CAM beyond routine vitamin/mineral supplementation alone. Independent variables explored were socio-demographic and clinical characteristics as well as quality of life (QOL), perceived understanding of cancer diagnosis, and perceived emotions about cancer and the future. All data was analyzed using SPSS Version 21.

RESULTS: Survey respondents were on average 66 years of age; 56.5% female; 88% Whites; 75% were above the poverty line; 85% were ≥ HS grads. 42% of respondents reported the use of at least one type of CAM. CAM-users and non-users did not differ based upon demographics, diagnosis, staging, smoking status, QOL, or perceived understanding of cancer diagnosis. In multivariate logistic regression analysis, which included demographic characteristics, patients who reported feeling fearful about their future were 4.55 times more likely to be CAM-users when compared to those who did not specify this emotion (AOR=4.55; 95%Cl: 1.38-15.06; p=0.01). Commonly cited reasons for CAM use were to support one’s self, boost immunity, and for improvements in emotional and/or spiritual wellbeing.

CONCLUSIONS: A substantial proportion of lung cancer patients in western NY reported the use of at least one CAM modality, and utilization rates are similar to those seen in the general US population. Although fear was associated with greater CAM use among respondents, common reasons for use suggest patients may be turning to CAM as a way to actively cope with emotional distress surrounding the cancer experience and for a therapeutic adjunct. Future studies should explore how CAM use may impact patient-centered outcomes and psychosocial needs of cancer patients.

Early life exposures and breast cancer (BC) risk among African American (AA) and European American (EA) women

Mark Glasgow, Jo Freudenheim, Gary Zirpoli, Elisa Bandera, Christine Ambrosone

BACKGROUND: There is evidence to suggest that early life exposures including birthweight, history of having been breastfed during infancy, in utero exposure to maternal smoking, and parental education are associated with BC risk. Potential underlying mechanisms include variability in exposure to maternal endogenous sex and growth hormones. Also, parental socioeconomic status may be a proxy for environmental characteristics that impact biological processes in early life, and ultimately influence BC risk. Research has focused on EA women; relatively little is known about associations between early life exposures and BC risk for AA women.

METHOD: We conducted a case-control study in AA and EA women aged 22-75 years living in metropolitan New York City and eastern New Jersey (Women’s Circle of Health Study). Breast cancer cases (AA n=987; EA n=772) were diagnosed with primary, incident, histologically confirmed invasive BC or ductal carcinoma in situ. Controls (AA n=958; EA n=715) were frequency matched to cases on age and race. Breast cancer cases (AA n=987; EA n=772) were diagnosed with primary, incident, histologically confirmed invasive BC or ductal carcinoma in situ. Controls (AA n=958; EA n=715) were frequency matched to cases on age and race. Birthweight, history of having been breastfed during infancy, history of in utero exposure to maternal smoking, and parental education were by self-report using an interviewer-administered questionnaire.

RESULTS: Birthweight was not significantly associated with BC risk in this study for AA or EA women. Having been breastfed during in-
fancy was associated with significantly increased BC risk for both groups (OR_{AA}=1.55, 95% CI: 1.24-1.93; OR_{EA}=1.45, 95% CI: 1.13-1.84). For EA women, but not AA women, reporting in utero exposure to maternal smoking was associated with significantly decreased BC risk (OR=0.61, 95% CI: 0.45-0.82). Among AA women, those born to mothers with at least a college degree had a significantly lower BC risk compared to AA women born to mothers with a high school or less education (OR=0.66, 95% CI: 0.49-0.90). Among EA women, we found no association with maternal education. However, EA women born to fathers with at least a college degree had a significantly lower BC risk compared to EA women born to fathers with a high school or less education (OR=0.65, 95% CI: 0.51-0.84).

**CONCLUSIONS:** Our findings support the hypothesis that early life exposures impact adult BC risk. History of having been breastfed during infancy, in utero exposure to maternal smoking, and parental education were all associated with BC risk. While minor differences in risk estimates were found between EA and AA women, associations were similar.

**Genetic Polymorphisms of TERT and CLPTM1L and Risk of Lung Cancer – a Case-Control Study in a Chinese Population**

**Ajay Myneni**

**OBJECTIVES:** We examined the association of single nucleotide polymorphisms (SNPs) in telomerase reverse transcriptase (TERT) and cleft lip and palate trans-membrane 1 like (CLPTM1L) genes with lung cancer and explored their potential modifying effects on the relationship between environmental risk factors and lung cancer in a Chinese population.

**METHOD:** We genotyped rs2736100 (TERT) and rs401681 (CLPTM1L) SNPs in a population based case-control study with 399 lung cancer cases and 466 controls form Taiyuan, China. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated using unconditional logistic regression models. Potential confounders were controlled for in the adjusted models.

**RESULTS:** The GG genotype of TERT was positively associated with lung cancer (OR = 1.47, 95% CI: 1.00–2.16). The association was stronger in participants older than 60 years, exposed to low indoor air pollution and with adenocarcinoma and squamous cell carcinoma (SCC). The GA genotype of CLPTM1L was inversely associated with lung cancer (OR = 0.72, 95% CI: 0.54–0.97). The association was stronger in participants 60 years old or younger, males, heavy smokers, exposed to low indoor air pollution and with SCC. Individuals carrying both TERT and CLPTM1L risk genotypes had higher risk of lung cancer (OR = 1.80, 95% CI: 1.15–2.82). Significant interaction was observed between CLPTM1L and indoor air pollution in association with lung cancer.

**CONCLUSIONS:** Our results reiterate that genetic variants of TERT and CLPTM1L contribute to lung cancer susceptibility in Chinese population. These associations need to be verified in larger and different populations.

**Identification of arsenic-responsive microRNAs in rats by genome-wide high-throughput sequencing**

Yichen Ge, James R. Olson, Hongmei Wu, and Xuefeng Ren

**OBJECTIVES:** Consumption of drinking water contaminated with arsenic, a naturally occurring carcinogenic metalloid, constitutes a major public health problem. Although the relationship between exposure and carcinogenesis is well documented, the mechanisms by which arsenic participates in tumorigenesis are not fully elucidated. Epigenetic modifications are often dysregulated in cancer and occur following exposure to a number of carcinogenic chemicals and are suggested to play a key role in arsenic-induced carcinogenesis. Beyond DNA methylation, other epigenetic mechanisms, in particular microRNA expression, that play a critical role in regulation of gene expression, have yet to be adequately investigated for arsenic. We conducted animal study chronically exposed to arsenic to identify arsenic-responsive microRNAs.

**METHOD:** In the current study, male rats were exposed to sodium arsenite (As(3+)) in various doses in drinking water for 60 days. miRNAs was extracted from rat liver, the primary tissue for arsenic metabolism and potential target of arsenic carcinogenesis, following As(3+...
ment. Genome-wide profiling of miRNA in rat livers was generated to identify As(3+)responsive miRNAs by next generation high-throughput sequencing technology.

**RESULTS:** The results showed that exposure to environmentally-relevant levels of As(3+) lead to aberrant expression of multiple miRNAs in rat liver. More importantly, the expressions of several miRNAs, which have been linked to carcinogenesis, were altered in a dose-dependent manner.

**CONCLUSIONS:** These findings suggest that sub-chronic arsenic exposure can disrupt the regulation of miRNAs expression. These arsenic-responsive miRNAs may be used as early pre-disease epigenetic biomarkers of arsenic exposure. The results may also provide insights into the role of miRNAs in arsenic carcinogenesis.

*Impact of advertising on beverage demand curves and break points*

Anushree Sharma, Kristie M. June, Richard O'Connor

**OBJECTIVES:** As part of the data collected for a study conducted through Roswell Park Cancer Institute we sought to examine product demand curves and price break points for various different beverages.

**METHOD:** A total of 1062 individuals participated in an online study, and as part of the study design they were separated into two groups. One group of participants viewed advertising materials on smokeless tobacco products, while the other participants viewed advertisements on three different beverages: Coca Cola, Vitamin Water and Minute Maid. Participants were shown the advertising materials and then asked questions to assess their demand for the different products.

**RESULTS:** We conducted an ANOVA test to see if participants who viewed the beverage advertisements were willing to pay a higher price for the product compared to participants who did not view the ads. After conducting the analysis, we did not see any significant differences due to the different ad groups (p = 0.332). The mean break points for the beverages were: $2.06 for Coca Cola, $1.85 for Vitamin Water, and $2.10 for Minute Maid orange juice. We did see a significant difference in the mean price participants were willing to pay for Vitamin Water compared to the other products.

**CONCLUSIONS:** Our results indicate that there are no statistically significant differences between the breakpoints for the two different advertisement groups. Participants were willing to pay a greater mean price for Coca Cola and Minute Maid orange juice compared to the mean price for Vitamin Water.

*Insulin-like growth factor biomarkers and genetic polymorphisms are associated with adenomatous polyp risk*

Caila Vaughn, Heather M. Ochs-Balcom, Jing Nie, Zhengyi Chen, Cheryl L. Thompson, and Li Li

**OBJECTIVES:** Obesity is an established risk factor for colon cancer. Colorectal adenomas are precursors to colorectal cancer that have been previously linked to insulin resistance. In this study we examined the association of circulating levels of IGF-1 and its main binding protein, IGFBP-3, as well as single nucleotide polymorphisms (SNPs) in the IGF1R and IG2R genes with risk of adenomatous polyps in the *Case Transdisciplinary Research on Energy and Cancer (TREC) Colon Polyps Study.*

**METHOD:** At colonoscopy, 410 incident and pathologically confirmed adenoma cases were identified, as were 1070 polyp-free controls. Levels of the circulating biomarkers were categorized into tertiles based on the distribution in the controls. Logistic regression modeling was used to adjust for age, sex, body mass index, smoking status, NSAID use and family history of colorectal cancer to test for associations with circulating IGF-1 and IGFBP3, as well as SNPs in candidate genes.

**RESULTS:** In logistic regression models stratified by race, we identified higher odds of adenomatous polyps with high circulating IGF-1 in African Americans only; the adjusted odds ratios for tertiles 2 and 3 compared to the lowest tertile were 1.68, 95% CI: 1.06-2.68 and 1.68, 95% CI: 1.05-2.71, respectively. Of ten tag-SNPs genotyped in the IGF1R gene, one SNP, rs4966011, was found to be associated
with reduced odds of polyps in Caucasians only.

**CONCLUSIONS:** Our study suggests that there may be race-specific differences in the association on the IGF pathway and risk of adenomatous polyps, however further studies are needed to replicate our findings.

**Periodontal disease and lung cancer incidence in the Women’s Health Initiative Observational Study (WHIOS)**

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**OBJECTIVES:** While there is some evidence that periodontal disease history (PDhx) is positively associated with lung cancer (LC), prospective studies in women are limited. Previous findings may inadequately account for residual confounding by smoking.

**METHOD:** Prospective analyses were conducted in a cohort of 66,171 postmenopausal women (mean age = 68.8; 43.5% former and 3.9% current smokers) enrolled in the WHIOS. PDhx was self-reported, with 645 subsequent incident LC cases occurred during follow-up (6.9±2.5 years). Cox regression analysis was used to estimate hazard ratios (HR) and 95% confidence intervals (CI) for the association of PDhx (prevalence of 26.1%) and incident LC adjusting for detailed smoking history measures and other potential confounders.

**RESULTS:** Among all women, the association between PDhx and LC was significant in unadjusted analysis (HR=1.76, 95% CI: 1.50-2.06), and was attenuated but remained significant after adjusting for detailed smoking history and other potential confounders (HR=1.25, 95% CI: 1.06-1.48). In analyses restricted to never smokers, PDhx was not associated with LC (HR=0.97, 95%CI 0.64-1.51). However among ever smokers, there was a suggestion of a synergistic association when stratified jointly on tertiles (T) of pack-years smoking and PDhx (PDhx- = No; PDhx+ = Yes): T1 (PDhx-: referent; PDhx+: HR=0.995, 95%CI 0.50-1.97), T2 (PDhx-: HR=1.97, 95%CI 1.32-2.96; PDhx+: HR=3.16, 95%CI 2.05-4.87), and T3 (PDhx-: HR=2.79, 95%CI 1.79-4.34; PDhx+: HR=3.54, 95%CI 2.25-5.58).

**CONCLUSIONS:** Periodontal disease was not independently associated with LC in non-smoking postmenopausal women. Among smokers, the potential synergism between periodontal disease history and smoking on LC should be further examined.

**Pilot Evaluation of a Dedicated Institutional Tobacco Cessation Service for Thoracic Clinic Cancer Patients**

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**OBJECTIVES:** Assess initial response rates and quit outcomes from a mandatory tobacco assessment and cessation program for patients presenting at a thoracic oncology clinic at Roswell Park Cancer Institute.

**METHOD:** Using a combination of the electronic medical records, finance records, and tobacco cessation service notes, descriptive statistics were used to describe 1) the numbers of patients eligible for the service; 2) the proportion of patients interested in the service; 3) the demographic characteristics of these patients; and 4) the quit rates of these patients at screening, 1st and 2nd contact by a tobacco cessation specialist.

**RESULTS:** A total of 980 new thoracic clinic patients were referred to the cessation service from January 2011 and October 2012. Among the 788 patients with contact attempts by the cessation service, 81.2% (n=640) were successfully contacted and only 2.5% (n=20) refused the offer of cessation support. The first successful telephone contact was made an average of 28 days after referral, where 75.6% (n=484) of patients reported continued current tobacco use. Follow-up calls were placed for 53.1% (n=340) of those who participated in the first contact an average of 39 days after the first
successful contact. The follow-up had a 93.2% (n=317) participation rate which revealed that 33.3% (n=106) reported not smoking.

CONCLUSIONS: Data demonstrate that an automated tobacco assessment and cessation program for thoracic oncology patients can effectively generate a large referral base with high patient interest in cessation, and that cessation support can be implemented and maintained in high risk cancer patients.

TB misclassifications amongst resettled refugees in Buffalo, NY from 2005-2012

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BACKGROUND: Various studies have described TB misclassification suggesting systematic errors in the use of microbiological, clinical and radiographic diagnostic measures. Jericho Road Family Practice (JRFP), a family medicine clinic on the west side of Buffalo, offers primary care to refugees and other underserved populations. We decided to analyze the degree of TB misclassification observed among recently resettled refugees in Buffalo between 2005-2012. We were specifically interested in exploring the types of misclassification (overdiagnoses vs. underdiagnoses) as well as the possible reasons propagating such error (i.e. random vs. systematic).

METHOD: This was a retrospective chart review among refugees who were resettled in Buffalo between January 2005 to December 2012 and who were registered patients at JRFP (n=282). We reviewed all DGMQ Class B1-3 and ATS Class 2 (LTBI) cases in existent records at JRFP refugee clinic. Required independent variables were country of origin, country of refugee camp internment, year of resettlement, purified protein derivative (PPD) induration (in mm), chest x-ray (CXR) findings, treatment status, as well as HIV/AIDS status.

RESULTS: Out of a total of 282 charts reviewed, 229 were misclassified (81.2%). Of those classified as B1/B2 (TB infection), 24.2% actually had no infection upon arrival (i.e. underdiagnosed).

DISCUSSION: The public health implications of misclassification range from costs of unnecessary treatment to stigma associated with misdiagnosis to the potential to spread disease. We strongly urge policymakers to implement the use of interferon-gamma release assays (IGRAs) as a part of the screening process for all refugees – particularly those targeted for resettlement in the US.

Use of a Human Haploid Cell Based Loss of Functional Genetic Screening Model to Identify Human Susceptibility Genes for Chlorpyrifos Toxicity

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OBJECTIVES: Chlorpyrifos (CPF), one of the most widely used organophosphorous pesticides, has been known to cause neurotoxicity through the inhibition of cholinesterase activity. However, other neurobehavioral deficits, unrelated to cholinesterase inhibition, have been linked to chlorpyrifos exposure. The mechanisms behind these effects are not fully known or understood. High-throughput loss-of-function genetic screening tools in yeast or other non-mammalian model systems have been successfully used to study human susceptibility to chemical exposure and decipher chemical compounds mode of action. We recently obtained a newly developed human haploid cell based loss of functional genetic screening model and applied this haploid cell model to identify human susceptibility genes for Chlorpyrifos.

METHOD: Human leukemia haploid cells were treated with 200 µM CPF, a dose causing 30% death of haploid cells after 3 days of treatment. After 21-days of treatment, cells resistant to CPF-induced toxicity were collected and splinkerette-PCR and sequencing techniques were applied to identify the depleted genes in these collected cells.

RESULTS AND DISCUSSIONS: Using this human haploid cell based loss of functional genetic screening model, we were able to identify cells carrying genes with deficient functions that play a role in the resistance to CPF-induced
toxicity. We are currently conducting functional tests to validate their association with CPF toxicity. Ultimately, this approach will help identify novel susceptibility genes and gain insight into potential mechanisms of CPF-induced toxicity.

Validation of an index of proxy measures and self-reported handwashing behavior in Dhaka, Bangladesh

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OBJECTIVES: Handwashing with soap reduces diarrhea, a leading cause of death in children. Structured observation permits direct measurement of handwashing, but is inefficient and costly. Efficiently collected measures of handwashing include rapid observation and self-report, but in isolation are poor indicators of behavior. Using data from primary caregivers in a case-control study, we developed an index of handwashing measures, and tested its validity by comparing it to structured observation measurements.

METHOD: We used a data reduction technique to generate handwashing index scores for caregivers based on the efficiently collected measures. We assigned caregivers to handwashing index quintiles and used logistic regression to compare quintiles to observed handwashing with soap in a structured observation, accounting for repeated events.

RESULTS: We observed 1,958 fecal contact events, 39% of which were followed by handwashing with soap. Each quintile except the third was associated with an increased odds of observed handwashing with soap compared to the first quintile [2nd quintile OR=1.41, p=0.03, 3rd OR= 0.96, p= 0.81, 4th OR=1.34, p=0.05, 5th OR=1.30 p=0.08]. There was no significant linear trend (p-trend=0.11).

CONCLUSIONS: This method did not identify progressive increases in observed handwashing. Construction and validation of indices represents one approach to addressing the need for low-cost, efficient, and reliable handwashing measures.