43.4% for the year we studied. Of the patients who received NACT, 19 met full Aletti Criteria at diagnosis, precluding them from being considered for surgery. In addition, 21 patients had medical contraindications to surgery, meaning that a total of 40 patients who were given NACT were not able to be considered for PDS. If we then take into account only the patients who were medically eligible for PDS, the rate of NACT at MSKCC drops to 23.1%, almost half of the original value. These medically eligible patients are the population that should be receiving an MSKCC resectability score. Of the 98 patients who underwent PDS, 21% had a resectability score calculated by the MSKCC algorithm, 81.3% of those patients were deemed to be “low risk” and 15.2% were deemed to be “high risk” of a suboptimal debulking. The algorithm dictates that all “high risk” patients who go on to PDS should undergo a laparoscopy first to assess for resectability and potentially avoid an unnecessary open procedure. Hundred percent of the “high risk” cases that were taken to the OR had an initial exploratory laparotomy proceeding with PDS. Overall, 93.1% of those patients that underwent PDS had an optimal cytoreduction, or ≤1 cm residual disease at the conclusion of surgery. Of the 6 patients throughout the year that had a suboptimal outcome, or >1 cm residual disease, 3 were initially scored as “low risk,” 1 was scored as “high risk,” and 2 did not receive an MSKCC resectability score prior to their procedure. Of note, 3 of the suboptimal cases had unresectable disease in an anatomic location not accounted for in the resectability algorithm. DISCUSSION/SIGNIFICANCE OF IMPACT: The rates of PDS Versus NACT vary widely between institutions, and it is not always clear how calculations are made. High-volume centers likely see a higher percentage of sicker patients with more advanced disease, which could increase their rates of NACT. In many of our patients, we are not eligible for surgery. It is critically important to standardize the way our field quotes NACT rates, and to understand how treatment decisions are being made at a given institution. PDS has a demonstrated survival benefit, and while we would ideally use this modality for all of our patients, there will always be a baseline percentage of patients who cannot be considered for the surgery. Since we will never be able to offer those patients PDS, our objective should be to identify patients within our population that may benefit from our procedure and to work toward optimizing their outcomes. In this study we identified the population of patients who are truly the PDS Versus NACT cohort as they were eligible for both modalities. We then examined the application and utility of the MSKCC resectability algorithm in an attempt to further optimize treatment allocation. This scoring system was implemented at our hospital over the past year with the goal that 100% patients going on to PDS would receive a preoperative resectability score. Unfortunately, 26.5% of PDS patients were not scored prior to their procedure. This makes it more difficult to evaluate the efficacy of the scoring system, especially considering 1/3 of the suboptimal cases were not scored. Had these patients received a score, they might have been deemed “high risk” and could have avoided a lengthy operation with a significant chance of a suboptimal outcome. In addition, it is important to note that 3 of the suboptimal PDS outcomes were initially scored as “low risk,” and 3 of the suboptimal outcomes were due to disease locations not accounted for in the original resectability algorithm. We will continue logging disease locations of suboptimal cases, it is possible that a certain disease location not in the scoring system is responsible for a significant portion of suboptimal outcomes. The resectability score model had an overall predictive accuracy of 0.756 when it was initially published, and we must continue tracking scores and outcomes to determine its validity when applied prospectively in our population. In order to accurately do so however, an emphasis should be made to ensure 100% of patients being considered for PDS receive a score going forward.

**Effects of a novel 2-phase rehabilitation program on postural control in older adults: A pilot study**

Evan Papa, Mahdi Hassan, Sandra Hunter, Rita Patterson and Nicoleta Bugnaru

OBJECTIVES/SPECIFIC AIMS: Falls are a major source of morbidity and disability in the aging population. Twenty to thirty percent of older adults who fall suffer moderate to severe injuries such as lacerations, hip fractures, and head traumas. A serious component of falling often overlooked is the fear of falling. The fear of falling is part of a debilitating spiral that leads to decreased activity and muscle weakness. The goal of this investigation was to determine if a novel 2-phase rehabilitation program designed to reduce the fear of falling and increase muscle strength could improve postural control during falls in older adults with balance impairments.

**METHODS/STUDY POPULATION:** Four older adults participated in 8 cognitive restructuring workshops entitled A Matter of Balance (AMOB); 2 hours/week, total of 16 hours, designed to restructure thought patterns relative to falls and reduce the fear of falling. Within 1–2 weeks of completion, participants enrolled in Phase II: a standardized 10-week lower-extremity strengthening program. Participants performed high-intensity concentric resistance exercise on a modified seated ergometer (Eccentric, BTE Technologies) twice per week for up to 20 minutes per session. Fear of falling was assessed using the Activities-Specific Balance Confidence (ABC) scale. Postural control was assessed during reproduced falls after 3 replicates at a rate of 10–15% 1 sample, 2 failed (T1) and after Phase II strengthening (T2). Falls were induced by treadmill perturbations (VGait system, MotekForceLink) occurring at slow and fast belt accelerations. A 3 × 3 ANOVA was conducted on postural control outcomes with phase and stepping cycle as independent factors. Pairwise comparisons were analyzed with the Bonferroni correction. RESULTS/ANTICIPATED RESULTS: Statistically significant main effects were found for phase and stepping cycle (p = 0.003, p = 0.00). No statistically significant interaction effects were found. However, a trend toward increasing Center of Pressure-Center of Mass (COP-COM) distance occurred after each intervention phase (T1 and T2) during fast treadmill perturbations. The greatest increase in COP-COM distance was found at 100% of the stepping cycle during fast perturbations following 10 weeks of resistance training compared with baseline (p = 0.006). No significant differences were found in fear of falling between phases (p = 0.682). DISCUSSION/SIGNIFICANCE OF IMPACT: A large COP-COM distance suggests the individual is able to allow straying of the COM outside of the functional base while recovering balance. Meanwhile, a small COP-COM distance represents a conservative approach to postural tasks, in that the performer does not feel stable enough to allow separation of the COP and COM. These pilot data suggest that a 2-phase rehabilitation program can improve specific components of postural control during recovery from falls. Rehabilitation interventions aimed at reducing falls in older adults should consider adding a component of cognitive restructuring in conjunction with standard of care resistance training.

**Lower rates of influenza infection following 2 dose series of high-dose vaccination in plasma cell disorders: Results of a randomized, double-blind, placebo-controlled study**

Andrew Brangan, Eamon Duffy, Terri Parker, Stuart Seropian, Connor Foster, Lin Zhang, Rakesh Verma, Gелиang Gan, Daniel Zelterman, Debra Brandt, Jeremy Kortmansky, David Witt and Madhav Dhodapkar

**Yale School of Medicine, New Haven, CT, USA**

OBJECTIVES/SPECIFIC AIMS: (1) Evaluate safety of a novel influenza vaccination strategy in patients with plasma cell disorders. (2) Measure laboratory-confirmed influenza infection rates following a novel influenza vaccination strategy in patients with plasma cell disorders. (3) Evaluate clinical correlates of response following a novel influenza vaccination strategy in patients with plasma cell disorders. METHODS/STUDY POPULATION: We conducted a double-blind, randomized study over the 2015–16 flu season, comparing 2 doses of Fluzone® High-Dose influenza vaccine (separated by 30 d) to the current standard of care influenza vaccine. Patients were allocated to the experimental arm in 2:1 ratio compared with standard of care arm. Standard of care influenza vaccination was considered single age-based vaccination (standard dose for those <65 y and high dose for those ≥65 y) and patients in this arm received 1 dose of Fluzone high-dose vaccine. Median age was 67 years (range 42–90). This 2-dose vaccination strategy was safely tolerated in all patients with no grade 2 adverse events attributed to vaccine. With close clinical follow-up, only 4% of patients receiving 2 vaccine doses developed laboratory confirmed influenza virus (8.3% of those receiving single vaccine). When compared to the expected CDC influenza infection rates for the age group 65+ in the general population, the vaccination testing revealed patients receiving 2 vaccines experienced a significantly lower rate of infection than the expected rate (p < 0.05) whereas those receiving single vaccine showed no significant difference (p = 0.38). DISCUSSION/SIGNIFICANCE OF IMPACT: This randomized study demonstrates that the 2-dose strategy using Fluzone® high-dose influenza vaccine is safely tolerated in patients with plasma cell disorders and associated with significantly less than expected laboratory-confirmed influenza infections. The results suggest that this novel
Gender differences in the pharmacology of buprenorphine sublingual tablets in Hispanics/Latinos: An underrepresented population
Darlene Ivelisse Santiago and Jorge Ducung
University of Puerto Rico-Medical Sciences Campus, San Juan, Puerto Rico

OBJECTIVES/SPECIFIC AIMS: The objective of this study is the pharmacology of sublingual Buprenorphine in Hispanic/Latino men and women. Specifically we plan to: (1) Administer sublingual buprenorphine to Hispanic/Latino men and women volunteers, and measure the circulating amounts of the drug in the bloodstream as a function of time; that is, pharmacokinetics of buprenorphine. The goal of the proposed study is to evidence that there are gender and ethnic differences in the pharmacokinetics of sublingual buprenorphine between not only Hispanics/Latinos and non-Hispanics/Latinos (Caucasian), but also within Hispanic/Latino men and women. METHODS/STUDY POPULATION: We are proposing a phase 1 of buprenorphine using 12 healthy volunteers. To test for differences in pharmacokinetics between Hispanic/Latino men and women, 6 Hispanic/Latino men, and 6 Hispanic/Latino women 21 years of age and older will be recruited. The volunteers should be living in Puerto Rico, and must have both parents born in Puerto Rico. Sublingual buprenorphine will be administered using a low dose of 16 mg one time only. Blood samples will be collected from each volunteer at t = 0, 1, 2, 4, 6, 8, 12, and 24 hours after administration. The amount of circulating drug in the bloodstream of the volunteers will be measured using liquid chromatography combined with mass spectrometry. Pharmacokinetic obtained parameters will be maximal plasma concentration, minimal plasma concentration, predose concentration, 24 hour post predose concentration, the time for maximum concentration. The area under the curve will be determined by the trapezoidal rule. Male Versus female data will be compared using 2-tailed t-test. RESULTS/ANTICIPATED RESULTS: We anticipate that: (1) Hispanic/Latino women will have longer circulating times of the drug in the bloodstream and higher maximum concentrations, compared with men. (2) Hispanic/Latino men and women will have higher amounts of the circulating drug, compared with already reported pharmacokinetic data of non-Hispanic Caucasian men. DISCUSSION/SIGNIFICANCE OF IMPACT: Gender differences have been elucidated in the prevalence rates of substance abuse, health service utilization, treatment outcomes, and physiological consequences of drug consumption in the United States. It is known that in general, women present different drug dependence patterns than men; women usually suffer more severe physical and emotional consequences than men, yet women seek treatment for drug addiction in lower rates compared with men. Women also show lower pharmacological treatment effectiveness as they are less likely to feel satisfied upon entering a substance abuse treatment and they show higher craving levels. Sublingual buprenorphine is a very popular and relatively new medication used primarily for opioid addiction since 2002. Gender differences have been elucidated in the pharmacology of buprenorphine sublingual tablets used for the treatment of opioid addiction. One study showed that women had higher concentrations of circulating parent drug and it is metabolites compared with men. One metabolite in particular norbuprenorphine was found in almost lower ef f icacy outcomes but also higher toxicity and undesired effects. Unfortunately, the lack of pharmacological effectiveness and lack of satisfaction in women undergoing drug treatment programs has not been adequately studied to understand the gender difference in pharmacological treatment outcomes between Hispanic/Latino men and women. Due to the under-representation of Hispanic/Latino men but most importantly women in a studying the pharmacology of sublingual Buprenorphine, and considering the well-established gender difference of the principal enzyme (CYP 3A4) responsible for the pharmacology of Buprenorphine, we are proposing a pilot study of the pharmacology of sublingual Buprenorphine in Hispanic/Latino volunteers living in Puerto Rico with equal number of male and female patients. We expect our research to clinically and scientifically elucidate the gender differences of sublingual buprenorphine for opioid addiction in Hispanics/Latinos. The outcome of such research will be the foundation of subsequent clinical studies that aim in updating the current standard of care for Hispanic/Latino men and women that require therapy for opioid addiction.

Engraftment and gene expression of an HIV resistant immune system in a Phase I trial of an HIV stem cell gene therapy strategy
Joseph Anderson, Kyle Hendrix, Julie Beegle, Jan A. Nolta and Mehrdad Abedi

OBJECTIVES/SPECIFIC AIMS: To date, only 1 documented case of an individual cured of HIV has been reported. He received an allogeneic bone marrow transplant with cells harboring an HIV-resistant genotype. To mimic this result, we have initiated a Phase I to evaluate the safety of an autologous stem cell gene therapy bone marrow transplant in HIV-related lymphoma patients. METHODS/STUDY POPULATION: The first cohort of patients will receive a 1:1 ratio of unmanipulated CD34 hematopoietic stem cells (HSC) and lentivirus modified CD34 HSC expressing a combination of HIV-resistant genes and a selectable marker for cell sorting prior to transplantation. Safety of the HIV-resistant stem cells will be assessed by evaluating engraftment, expression of the anti-HIV genes, and the stability and sequence of the vector. RESULTS/ANTICIPATED RESULTS: One patient has been enrolled and transplanted with the HIV-resistant stem cells. After 1 and 2 months post-transplant, patient blood samples were received, processed for genomic DNA, analyzed by quantitative PCR (qPCR), and displayed successful engraftment of 16 and 12 vector copies per 100 cells, respectively. Expression of all anti-HIV genes was confirmed by qPCR. PCR on genomic DNA confirmed the correct sizes and sequences of the integrated vector and confirmed the successful engraftment of our gene modified cells. Currently, we are enrolling more patients into the trial. DISCUSSION/SIGNIFICANCE OF IMPACT: If successful, this therapy has the potential to change HIV treatment.