originally published central 95%. However, a striking difference exists in calculated ULs from data of European and US origin: For ages 10-18 years, calculated UL on average was 149.3 ng/mL (34.6%) higher in boys and 94.9 ng/mL (19.8%) in girls from the US. In adults (19-95 years), calculated UL on average was 45 ng/mL (20.3%) higher in males and 29.7 ng/mL (13.8%) in females from the US. Within the US, mean IGF-I was significantly higher in samples from Colorado (lower mean BMI) than in Alabama (p<0.0001) across age- and sex groups, although the difference between the two states was smaller than between each of them and Europe. Conclusion: This study provides evidence that in sufficiently large datasets, both, direct sampling (as in the original publication) and the indirect Hoffmann algorithms provide statistically comparable RI limits and may be considered as accurate representation of results distribution in the disease-free populations. More importantly, we demonstrate that even with tight cross-correlation and continuous monitoring of IGF-I assay performance RIs generated in different populations can be different. Notably, in our extremely large study, the difference between Europe and the US was clinically relevant only at the UL. Although our study cannot reveal the cause of the difference, we suggest using adapted RIs for the US.

Diabetes Mellitus and Glucose Metabolism
CLINICAL AND TRANSLATIONAL STUDIES IN DIABETES

Transcutaneous Magnetic Stimulation: A Novel Treatment of Diabetic Peripheral Neuropathy

Medha Satyarengga, MD[1], Kashif M. Munir, MD[2].
[1]University of Maryland Shore Regional Health, Easton, MD, USA, [2]University of MD Medical Center, Baltimore, MD, USA.

MON-LB109

Objective: Transcutaneous Magnetic Stimulation (TCMS) is reported to be an effective treatment in multiple neurologic conditions such as migraine headaches, lower back pain, and post-traumatic peripheral neuropathic pain[1-3]. The efficacy and safety of TCMS for diabetic peripheral neuropathy is not known. We evaluated whether TCMS is effective and safe in patients with diabetic peripheral neuropathy. **Method:** Eight patients with a previous diagnosis of diabetic peripheral neuropathy and baseline numerical pain-rating scale (NPRS) of 5 or greater in both feet were enrolled. NPRS scale was set from 0 to 10, 0 represents no pain and 10 representing the most severe pain. Each patient was treated with a single session of TCMS applied first on the plantar then the dorsal surface of both feet. Magnetic pulses (1.2 Tesla) were delivered every 6 seconds for 5 minutes in each foot on the plantar and dorsal surfaces, respectively. NPRS was repeated post-treatment over the course of 28-days follow-up period. **Results:** The mean baseline NPRS was 5.8 (± 1.0). Immediately post-treatment, mean NPRS improved to 1.3 (± 1.9), a 77.7 (± 36.5) % decrease. Mean NPRS at 7 and 28 days of follow-up was 2.9 (± 2.8) and 4.1 (± 3.3), respectively. These represent a 53.2(± 42.4) % improvement at 7 days and 30.5(±52.4) % improvement at 28 days of follow-up compared to baseline NPRS. None of the patients reported significant

discomfort during the treatment, and no major side effects were observed during the study period. **Conclusion:** In this pilot study of patients with diabetic peripheral neuropathy, TCMS appears to be a safe and effective alternative in providing temporary pain relief. Longer and more frequent treatment sessions need to be explored to see if these can increase the effective duration.

References: 1. Barker AT, Shields K. Transcranial Magnetic Stimulation: Basic Principles and Clinical Applications in Migraine. *Headache*. 2017 Mar;57(3):517-524. 2. Leung A, Fallah A, Shukla S. Transcutaneous Magnetic Stimulation (tMS) in Alleviating Post-Traumatic Peripheral Neuropathic Pain States: A Case Series. *Pain Medicine*. 2014 Jul; 15(7): 1196-1199. 3. Lim YH, Song JM, Choi EH, Lee JW. Effects of Repetitive Peripheral Magnetic Stimulation on Patients with Acute Low Back Pain: A Pilot Study. *Ann Rehabil Med*. 2018 Apr; 42(2): 229-238.

Healthcare Delivery and Education
EXPANDING CLINICAL CONSIDERATIONS FOR PATIENT TESTING AND CARE

Association Between Cancer Related Beliefs and Diabetes Medication Adherence Among Breast Cancer Survivors With Comorbid Type 2 Diabetes

Jody-Ann McLeggon, MPH[1], Jennifer Itty, MPH[1], Janey James, MPH[2], Wenjing Chen, MD[1], Mita Goel, MD, MPH[3], Yael T. Harris, MD, PhD[1], Jenny J. Lin, MD, MPH[2].
[1]Zucker School of Medicine at Hofstra/Northwell Division of Endocrinology, Great Neck, NY, USA, [2]Icahn School of Medicine at Mount Sinai, New York, NY, USA, [3]Northwestern Medicine Feinberg School of Medicine, Chicago, IL, USA.

MON-LB306

Introduction: Cancer and diabetes mellitus (DM) are leading causes of death in the United States. Each year, over 245,000 women are diagnosed with breast cancer, and approximately 18% of patients diagnosed have preexisting DM. The presence of a comorbidity, such as DM increases women's mortality risk by 40%. While studies have shown decreased adherence to hypoglycemic medications after cancer diagnosis, the effect of cancer related beliefs on DM medication adherence has not been fully explored. In this study, we evaluated the association between cancer related beliefs and DM medication adherence in survivors of breast cancer.
Hypothesis: Patients with greater positive beliefs about cancer (including personal control, treatment control and understanding) would exhibit greater adherence to DM medication.
Methodology: We enrolled women >55 years with Stage 0-IIIA breast cancer diagnosed in the past 10 years, who had completed chemotherapy and/or were prescribed hormonal therapy and had pre-existing type 2 DM treated with at least 1 oral DM medication. Cancer related beliefs were assessed using the Illness Perception Questionnaire (IPQ). Medication adherence was evaluated using the Medication Adherence Rating Scale (MARS). Adherence was dichotomized at a mean MARS score of ≥4.5. Wilcoxon rank-sum tests were used to examine the relationship between patients' cancer related beliefs and DM medication adherence.

Results: Thus far, 108 women have completed baseline surveys. Of these participants, 37% were black, 31% white, 14% Hispanic, 6.5% Asian, and 8.3% other. The mean age was 65 years. Cancer survivors who were adherent to DM medication had a greater sense of personal control over their cancer (median score 22.0 vs. 19.0, p<0.001) and endorsed a better understanding of their cancer (median score 20.0 vs. 14.0, p=0.03). No associations were seen between beliefs about the duration and consequences of cancer and DM medication adherence.

Conclusion: Among breast cancer survivors with comorbid DM, having a greater sense of control over and understanding of cancer was associated with DM medication adherence. Working with breast cancer survivors to increase their perceived control over and understanding of their cancer may help improve adherence to DM medication.

Bone and Mineral Metabolism
OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

Is It Possible to Optimize Resources in Bone-Alkaline Phosphatase Medical Request?

Ana M. Sequera, MSC[1], Gabriela Fernanda Ruibal, Biochemist[2], Eleonora Nuñez Chavarria, Biochemist[1], Gabriel Fideleff, Biochemist[1], María Jose Iparraguirre, Biochemist[1], Hilda Ines Farelo, Biochemist[1].

[1]Endocrinology Laboratory-Endocrinology Unit, Medicine Department. Hospital Dr. T. Alvarez, Caba - Buenos Aires, Argentina, [2]Endocrinology Laboratory-Endocrinology Unit, Medicine Department. Hospital Dr. T. Alvarez, Caba-Buenos Aires, Argentina.

SUN-LB73
INTRODUCTION: Bone metabolism assessment includes total alkaline phosphatase (ALP) and more specifically the bone-alkaline phosphatase (BAP) as markers of bone formation. Its measurement is important for diagnosis and in bone pathology treatment following-up. In our setting, a ten-fold price for BAP has raised the necesity to review in how many cases its request has been justified. **AIM**: Establish through an appropiate statistical analysis, cut-off values of ALP that could guarantee to perform BAP measurements. Its analysis would allow us to make a demand adequacy. **MATERIALS AND METHODS:** A retrospective study was carried out on laboratory analysis orders of 405 adult women. We separate them into the following groups: (G1): 48 premenopausal womens (pre) and 357 post menopausal women (pos): (G2)133 <60 years-old, (G3)135: 60-69 years-old and (G4)89: >70 years-old. All patients had measurements of both analytes; ALP (colorimetric method, Roche Cobas, Reference value (RefV)=40-130 UI/L) and BAP (QLIA, Liaison Diasorin, RefV pre=3-19 ug/mL, pos=6-26 ug/mL). Statistic analysis: ROC-Plot to define cut-off value (we define as true positive BAP values over RefV). Kruskal Wallis, Dunn test to compare all the groups. **RESULTS:** (median and range): ALP(UI/L) G1: 81(38-265) G2: 88(47-211)*, G3: 85(39-213) y G4: 80(40-138) (*p<0.05 G2vsG4). BAP (ug/L) G1: 13.6(5.1-106), G2: 14.3(3.5-61.5)*, G3: 13.9(2.9-52.5) and G4: 11.6(2.0-29.6), (*p<0.05 G2vsG4). We observe that 73% of G1, 93.5% of G2, 92.6% of G3, 97.7% of G4 has showed normal values. The ROC plot analysis showed the best cut-off for ALP in G1=87 (S=92%,Sp=85%,AUC=0.955). If, using this cut off we had processed 18 BAP which 6 patients would have been normal (33.4%). In G2=127 (S=100%, Sp=97.6%, AUC=0.996) using this cut off we had processed 13 BAP, which 4 patients would have been normal (30.8%). Meanwhile in G3=102(S=100%, Sp=85.6%, AUC=0.97) we had processed 30 BAP and G4=120 (S=100%, Sp=96.5%, AUC=0.966) we had processed only 6 BAP. **CONCLUSIONS:** Application of the calculated cut-off allowed us to investigate 97% of the pathological BAPs. The measurement of ALP first, would guarantee to process only 17% of the requested BAPs. This suggestion would result in a significant saving of our resources, maintaining the quality of care. It is necessary to apply cut-off according to age to justify the BAP assesment. Physicians must define the appropriate exceptions.

Adrenal
ADRENAL PHYSIOLOGY AND DISEASE

The Role of Androgen Receptors in Female Mouse X-Zone Loss During Aging and Pregnancy

Emily C. Frucci, Undergraduate[1], Matthew J. Taylor, PhD[2], Yewei Xing, PhD[1], Gary D. Hammer, MD,PhD[1], William E. Rainey, MS PhD[1].

[1]University of Michigan, Ann Arbor, MI, USA, [2]Northwestern University, Chicago, IL, USA.

SUN-LB41
Introduction: Sex differences are prevalent in the risk and manifestation of numerous human diseases as well as in the response to most therapeutic interventions. While marked sexual dimorphism is observed in the development, homeostasis and most diseases of the adrenal cortex, the impact of these differences on adrenal function remains poorly understood. Sex differences include the timing of adrenal fetal zone (X-zone) regression, which occurs during male mouse puberty but only after pregnancy or advanced age in females. The mechanisms driving regression, particularly in females, are unknown. A potential regulator of adrenal sexual dimorphism and X-zone regression is androgen exposure. Through adrenocortical-specific deletion of the androgen receptor (AR), we tested the hypothesis that androgen signaling is responsible for X-zone post-pubertal regression in male mice and post-pregnancy/aging related regression in female mice.

Methods: Adrenocortical-targeted *Ar* deletion was accomplished by crossing heterozygous aldosterone synthase-Cre mice to mice with a floxed exon 2 of *Ar* (AR$^{\Delta\Delta dr}$). Mice were sacrificed at 25 or 50 weeks of age and compared to AR$^{f/f}$ littermates (controls). Adrenals were processed for histology (H&E), immunofluorescence (IF) and whole adrenal mRNA RT-PCR to detect AR and X-zone specific markers *Akr1c18* (20αHSD) and *Pik3c2g*.

Results: In all mice, *Ar* mRNA expression was significantly decreased in AR$^{\Delta\Delta dr}$ mice compared to control littermates. As expected, 25 week control females had higher expression of *Akr1c18* (6740-fold) and *Pik3c2g* (198-fold) compared to 25 week control males. 25 week AR$^{\Delta\Delta dr}$ males retained expression of *Akr1c18* (20864-fold) and *Pik3c2g* (2802-fold)