broader differential. Altered nutrition habits is the cornerstone of therapy with which the primary aim is to reduce post-prandial glucose spikes in these patients after they eat carbohydrates. These spikes in turn lead to hyperinsulinism leading to subsequent hypoglycemia. Primary diet modifications include controlled carbohydrate consumption of less than 30g per meal, avoiding high glycemic carbs, and always taking in ample fat and proteins with every meal.

Genetics and Development (including Gene Regulation)

ENDOCRINE DISRUPTING CHEMICALS

Estrogen Receptor Alpha as a Potential Target for Bisphenol A-Mediated Epigenetic Reprogramming: An in Vitro Analysis

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SAT-726

Perinatal exposure to bisphenol A (BPA) has been shown to reprogram the hepatic epigenome of rodents and may promote the development of various metabolic diseases later in life, such as nonalcoholic fatty liver disease (NAFLD). This developmental reprogramming is characterized by the creation of "super promoters" at target genes implicated in metabolic pathways. While it is unclear how these "super promoters" are created, their creation is potentially mediated through BPA and estrogen receptor (ER) interaction. In order to test this potential mechanism, *in vitro* methods were used to examine ER target gene expression via RT-qPCR in 2 human hepatic cell lines transiently transfected with the ER isoform, ER alpha, prior to BPA exposure for various lengths of time. Within individual time points, there were no significant differences in target gene expression levels between cells that had been transfected with ER alpha and the vector control. Gene expression levels in the target genes were visibly increased at the 24-hour exposure mark in both transfection groups in comparison to the 0- and 6-hour time points, however only a fraction of these increases were found to be statistically significant. These gene expression patterns are not only consistent with previous studies examining target gene expression in BPA-treated hepatic cell lines, but more importantly, suggest BPA does not act via ER alpha to orchestrate the epigenetic changes seen *in vitro*. BPA may interact with a different ER isoform or an unknown target to create the observed "super promoters" at target genes, reinforcing the promiscuity of BPA and other xenoestrogens in facilitating epigenetic modifications, and ultimately, disease phenotypes.

Diabetes Mellitus and Glucose Metabolism

CLINICAL AND TRANSLATIONAL GLUCOSE METABOLISM AND DIABETES

Using Machine Learning on Electronic Health Records to Predict Inpatient Glucose Levels and Physicians' Insulin Dosing

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MON-611

The current optimal inpatient diabetes management schema involves administration of basal, prandial, and correctional insulin to maintain blood glucose (BG) within a target range. Nonetheless, practical management often fails to reach the ideal in both insulin dosing regimens and patients' BG outcomes. Given the challenges of achieving adequate BG control for hospitalized patients using guidelines and expert knowledge alone, we attempted to use machine learning methods to predict (1) individual BGs, (2) average daily BGs, and (3) physician-ordered insulin doses based on data in an electronic health record-based repository between January 2014 and December 2018. We considered inpatients on subcutaneous insulin having a BG ≥ 200 mg/dL or ≤ 70 mg/dL or with an A1c percentage ≥ 6.5%. We excluded those missing critical data (such as weight), with fewer than five BG checks in 72 hours, or those on hemodialysis, resulting in a cohort of 3,461 patients with 175,934 BG checks among them. In this cohort, the average age was 61.4 years, the average A1c was 7.1%, and the average BG was 171.6 mg/dL, with approximately 25% of BGs ≥ 200 mg/dL and 1.7% of BGs < 70 mg/dL. Using linear regression, we identified features that contributed most to prediction of each of the outcomes. For all three outcomes, the average glucose in the past 24 hours was the most important feature. For prediction of glucose levels, previous BG, BG at the same time the previous day, A1c, BG variance, recent long-acting insulin dose, and glucocorticoid dose were all in the top 10 features. Similar features were important for predicting physician-ordered insulin doses. Surprisingly, neither weight nor creatinine were identified as top features for any outcome. Using these features in our predictive model, we found that individual BGs were highly erratic and could not be predicted precisely (R^2 0.24). Similarly, and perhaps unsurprisingly, how physicians would order insulin for patients was also difficult to predict (R^2 0.25). However, average daily glucose levels were predicted more reliably (R^2 0.36), as was prediction of frank hyperglycemia (BG ≥ 200 mg/dL) in the next day (sensitivity 0.73, specificity 0.79). Given the typical practice pattern of a clinician evaluating the previous day's insulin regimen performance and adjusting it by anticipating BGs for the next day, prediction of hyperglycemia in the next 24 hours can support decision-making for inpatient BG management.

Diabetes Mellitus and Glucose Metabolism

CLINICAL STUDIES IN OBESITY, DIABETES RISK, AND CARDIOVASCULAR OUTCOMES

Associations Of Body Mass Index And Waist Circumference In Young Adulthood With Later Life Incident Diabetes

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SAT-616

Background: Overweight and obesity are known risk factors for incident diabetes, but it remains unclear if exposures during young adulthood (age 18 to 39 years) contribute to mid and late-life (age ≥40 years, collectively labeled here as "later-life") risk of incident diabetes independent of later-life risk factor exposures.
Objective: We sought to assess the independent associations between young adult exposures to overweight and obesity, as assessed by body mass index (BMI) and waist circumference (WC), with later-life incident diabetes, accounting for later-life exposures.
Methods: We pooled data from six US cohorts (ARIC, CARDIA, CHS, Framingham Offspring, Health ABC, and MESA), and imputed life-course risk factor trajectories for BMI and WC, as well as for multiple cardiometabolic risk factors, annually from age 18 years to end of follow-up for each participant. Incident diabetes was defined by observed fasting blood glucose ≥126 mg/dL, non-fasting glucose ≥200, or use of diabetes medications. We used Cox proportional hazards models to examine the independent associations between time-weighted average exposures to BMI and WC during young adulthood and incident diabetes. We also performed mediation analyses to assess whether these associations were mediated by young adult exposures to other cardiometabolic risk factors (blood pressure, lipids, insulin resistance).
Results: 30,780 participants were included (mean age at first in-person visit 53.1±16.2 years; 56.1% female). Over a 9-year median follow-up, 4,323 participants had incident diabetes. Both young adult BMI and WC were associated with diabetes risk in a dose-dependent manner, independent of later-life BMI and WC. Compared to BMI 18.5–24.9 kg/m^2, hazard ratios (HR) for incident diabetes were 1.27 (95%CI: 1.14–1.41) and 1.99 (95%CI: 1.67–2.37) for BMI 25–29 kg/m^2 and ≥30 kg/m^2, respectively. Similarly, compared to normal WC (≤80 cm women; ≤94 cm men), the HRs were 1.42 (95%CI: 1.26–1.59) for WC 81-88cm (women)/95-102cm (men) and 2.13 (95%CI: 1.87–2.43) for WC >88cm (women)/>102cm (men). Young adult homeostatic model of insulin resistance (HOMA-IR) mediated 49% (95%CI: 23–76) and 44% (95%CI: 26–62) of the association between young adult BMI and WC with later-life incident diabetes, respectively.
Conclusions: Elevated BMI or WC during young adulthood were independently associated with later-life incident diabetes, after accounting for later-life BMI and WC, with insulin resistance suggested as a key mediator.

Adrenal

ADRENAL CASE REPORTS II

Resistant Hypertension After Shockwave Lithotripsy: The Rude Awakening of an Adrenal Incidentaloma

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SUN-154

BACKGROUND
The National Institutes of Health defines adrenal incidentalomas (AIs) as clinically inapparent adrenal masses discovered inadvertently in diagnostic testing or treatment for conditions not related to the adrenal glands. Non-functional adenoma remains the most frequent (60–85%) cause, while functional adenomas at 5–16%.
CLINICAL CASE
A previously healthy 41 year-old female consulted for a 2-month history of left flank pain. Computed tomography (CT) scan of the kidneys revealed left calculi and incidental right adrenal mass. She was asymptomatic at this time. She then underwent shockwave lithotripsy for the renal calculi. However, postoperatively, she had elevated blood pressure and was started on anti-hypertensives. She remained hypertensive despite being on four different medications. Pertinent physical examination findings: plethora of the face and extremities, Moon facies, Buffalo Hump, and pendulous abdomen with grayish striae. Further work-up revealed the AI to be cortisol-secreting. Pertinent laboratories: 1 mg dexamethasone suppression test - 800 nmol/L (<50 nmol/L), 24-hr urine free cortisol - 1014.86 ug/24 hr (20–90 ug/24 hr), Adrenocorticotropic Hormone (ACTH) - 5.0 pg/ml (9–52 pg/ml). She then underwent a right laparoscopic adrenalectomy. Post-operatively, her blood pressure normalized without her anti-hypertensive medications. Tissue biopsy of the mass was consistent with an adrenocortical adenoma. On her follow-up after one month, signs of Cushing's Syndrome were clinically improving.
CONCLUSION
This is the first case that demonstrated shockwave lithotripsy converting a non-functioning adrenal incidentaloma into a functioning one. It also shows how internists and surgeons (i.e. Urologists) can manage various aspects of patient care through the facilitation of medical treatments, surgical interventions, and ensuring a proper multidisciplinary approach based on the endocrinology clinical guidelines. So as not to delay the delivery of proper management to the patient.
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Genetics and Development (including Gene Regulation)

G PROTEIN-COUPLED RECEPTOR SIGNALING IN ENDOCRINE SYSTEMS: NOVEL MECHANISMS IN HEALTH AND DISEASE

GRK2 Mediates Beta-Adrenergic Receptor Crosstalk to Enhanced Adrenocortical AngII-Dependent Aldosterone Production

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