FEBRUARY 2019 THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS OCCOUNTS OF THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS OCCOUNTS OF THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

Mr. Robot: Artificial Intelligence in Healthcare

No longer the fodder for Steven Spielberg movies, artificial intelligence is finding a home in the healthcare industry that could optimize the care patients receive. From applications that can improve diabetes outcomes to reducing the number of needless thryoidectomies, this once fanciful concept could be another tool that clinicians can use to individualize care.

TRENDING: Endocrine Society's updated guidance for flash CGMs

LABORATORY NOTES: Joel Habener's legacy of mentorship in the lab



Hormone Science to Health

Endocrine

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PRESIDENT'S VIEWPOINT



An Exciting ENDO 2019 Awaits You in New Orleans!

Soon we will be packing our bags for ENDO 2019. I could not be more excited for you to experience this year's program, which is designed to stimulate exploration, enrich our community, and enhance our understanding of the fundamentals. Your talented Annual Meeting Steering Committee (AMSC) embraced these concepts as they developed an outstanding scientific and clinical program that showcases leading-edge research and guidance for the most significant clinical challenges in endocrinology. Under the exceptional leadership of our chairs — Greg Brent, MD, W. Lee Kraus, PhD, Ghada El-Hajj Fuleihan, MD, PhD, and Susan Sherman, MD — the AMSC has created a meeting that you need to attend.

I am particularly thrilled to share that our popular Basic Science Pathways are returning with enhanced programming. To plan your schedule, all you need to do is choose from among the pathways: Neuroendocrinology, Nuclear Receptors and Gene Regulation, and Reproductive Endocrinology. These special "meeting within a meeting" tracks integrate focused discussions, symposia, special sessions, and networking opportunities. The Basic Science Pathways provide an ideal way to surround yourself with the latest research and opportunities to meet others who share your interests.

Highlights of ENDO 2019 include:

- The Presidential Plenary from National Institutes of Health director Francis Collins, MD, PhD, on translating whole genome approaches to unraveling diseases;
- Research pioneers, inductees into the National Academy of Sciences, and other luminaries will deliver plenaries on topics such as gene editing and stem cells, therapeutic targets in metabolic disease in cancer, big data in science and care, and targeting senescence in aging in disease;
- New Endocrine Society guidelines, including the Clinical Practice Guidelines on Treatment of Diabetes in Older Adults and on Pharmacologic Management of Osteoporosis in Post-Menopausal Women;
- Sessions dedicated to new technologies relevant for endocrine investigation, such as single cell sequencing, CRISPR, RNAi, and shRNA screens; big data and bioinformatics for biologists; and artificial intelligence and digital health;
- Newly featured Year in Health Care Delivery special sessions on osteoporosis and thyroid diseases, exploring breaking science, guidelines, and research to close treatment gaps;



- Popular Master Clinician Sessions by global experts on subclinical Cushing's syndrome and therapy selection in type 2 diabetes based on cardiovascular disease outcomes;
- World-class, career-shaping resources for our clinical and basic science trainees;

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I could not be more excited for you to experience this year's program, which is designed to stimulate exploration, enrich our community, and enhance our understanding of the fundamentals.

- Heated debates examining target hemoglobin A1c levels as well as the best screening test for thyroid disease in pregnancy; and
- Expanded opportunities for you to showcase your discoveries and educate your colleagues.

ENDO 2019 will bring our community together in a vibrant and warm city and help each of us take the next steps on our personal and professional journeys. I look forward to seeing you in New Orleans, Louisiana, from March 23 to 26, 2019.

- Susan J. Mandel, MD, MPH, President, Endocrine Society

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FROM THE EDITOR

Stressed Out: The Perils of Burnout

n January, Medscape issued a report on the incidence of burnout, suicide, and depression from over 15,000 U.S. physicians across 29 specialties. Endocrinologists were the seventh most burned out of the specialties at 47% of those who responded; urology was the most burnt out (54%) while public health/preventative medicine physicians were the least stressed (28%).*

By a huge margin, the factor that contributes most to physicians' burnout is bureaucratic tasks such as charting and paperwork, which was the chief complaint among 59% of respondents, followed by spending too many hours at work at a distant second with 34%. One of the endocrinologists surveyed seemed to indicate that electronic health records were a major source of strife: "There's so much redundant work due to incompetent third parties' data collection," according to the survey. However, the topic that caused the least amount of burnout turns out to be the topic that bothered Rodney Dangerfield the most: Lack of respect (from patients). It will be interesting to see how the latter trend fares in the future as the patient population ages at the same time that access to technology increases, thus leading to an ever-expanding number of patients who show up in their doctor's office having already Googled their perceived illness or condition and ready to tell their physician what's wrong with them before they even say "Ahh."

In terms of work setting, however, burnout among all physicians is greatest at healthcare organizations with almost half of all those indicating they suffered from burnout at 49%. To nobody's surprise, those least affected by burnout were physicians who had their own office-based solo practice, but that setting was only eight percentage points behind at 41%. Obviously, doing things your own way does have its advantages, one of which is less burnout.

Regarding physicians who are depressed and the likelihood that they will seek out professional help, it's not surprising that psychiatrists are at the top (45%). Allergists/immunologists are the least likely to seek out help (13%), but endocrinologists are smack dab in the middle at 26%. Comments from some of the surveyed physicians about why they don't seek help range from "It could have serious repercussions on my career" if it ever got out, to the fact that professional counseling won't change

Endocrine news

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the [electronic health records], physician shortage or the expectations of patients, adding "The system is broken, not my psyche."

When it comes down to which specialists are happiest at work, plastic surgeons were happiest (41%) and physical medicine and rehabilitation specialists were the least happy (19%) while endocrinologists were again, right in the middle at 26%.

Burnout at the Bench

Of course, burnout doesn't just affect physicians; plenty of researchers and scientists also feel the stress of burnout. In her February column, "Well Students = Well Field: An Equation for Success," *Endocrinology* editor-in-chief Teresa K. Woodruff, PhD, discusses a survey from *The Atlantic* regarding graduate student stress and resident/fellow burnout. Since these early-career endocrinologists spend the bulk of their lives at the bench developing their theses, defending their work and ideas, all while preparing to make the next step in their scientific careers, it's easy to see why burnout is often so prevalent.

A Harvard study found that 18% of PhD candidates at elite universities experienced moderate or severe depression and anxiety symptoms. That's three times the national average. Roughly one in 10 of those students surveyed reported having suicidal thoughts! In her column, Woodruff says that to ensure the health of the field of endocrinology, "we must ensure the health of our students," adding "Naturally, there is no singular route to feeling well—well-respected, well-enabled, wellbeing — but there are ways to integrate the 'ands' of life if you find yourself at a winter solstice of the soul."

While a grad student in the lab has a day filled with going down different paths to prove and test theories and support hypotheses, many times he or she will become exasperated by a particular outcome. Therefore, it is not surprising to learn of those numbers stated above. As frustrating as it may sometimes be, Woodruff writes that "Not making the outcome of an experiment a referendum on our worth is the first step toward a healthy career."

Woodruff further writes that she hopes that talking about the topic of wellness can create a better understanding of the stressors of science for what they are: "Hypothesis testing and retesting with answers never assured, with personal pains along the way, and with work and life as a continuum. And by making this topic communal, we will perhaps be better able to see signposts of distress and hold each other up so that no graduate student, postdoc, or faculty member ever feels alone."

To read Woodruff's entire column, go to: www.endocrine. org/wellstudents.

A more in-depth look at burnout among endocrine clinicians will be featured in a future issue of *Endocrine News*. Stay tuned.

- Mark A. Newman, Editor, Endocrine News





WHY ENDOCRINOLOGY?

The All-Encompassing Endocrine System

BY LAUREN FISHBEIN, MD, PHD, Assistant Professor in Medicine, University of Colorado School of Medicine, Division of Endocrinology, Metabolism and Diabetes with a secondary appointment in the Division of Biomedical Informatics and Personalized Medicine

n the mid 1990s, my father, a gastroenterologist, sent me an article on personalized medicine being the future of healthcare. Although the human genome had not been sequenced yet, this article suggested that in the future, physicians would use our personal genome to predict health and treat disease. This concept was fascinating to me!

At that time, I was a Vassar College student working in a *Drosophila melanogaster* laboratory with my mentor, Dr. Nancy Pokrywka, studying developmental genetics. Because I was at a small liberal arts college, I was privileged to work directly with Dr. Pokrywka for two years to learn how to run sucrose gradients, dissect *Drosophila* ovaries, run Northern and Southern blots, and perform transgene injections into *Drosophila* oocytes. My interest in research and genetics stems from this time in the laboratory.

Meanwhile, I was enrolled in a biochemistry class where my professor, Dr. J. William Straus, related each biochemical pathway to a specific human disease. In particular, I remember him discussing how alterations in the enzymes and channels involved in insulin signaling and gluconeogenesis could lead to diabetes mellitus. Relating biochemical pathways directly to human disease struck a chord with me. At the intersection of all these experiences, I decided to pursue an MD/PhD degree to combine my interest in genetics with clinical medicine to participate in personalized medicine research.

During my MD/PhD training at the University of Florida, I knew cancer genetics was the area of biomedical research for which I had a passion, and yet I could not ignore my love of endocrinology. In fact, as a first-year medical student, my fellow study group members predicted I would become an endocrinologist. They teased me that I became more

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animated with every discussion about hormone pathways, feedback mechanisms, and clinical endocrine syndromes. Whereas cardiology focuses on the heart and nephrology focuses on the kidney, endocrinology involves the entire body, and every organ is affected by the hormone system.

During my PhD training, my mentor, Dr. Margaret Wallace, helped me develop a new project in the lab

If you would like to share your story with our readers around the world, contact Editor Mark A. Newman at mnewman@endocrine.org.

to combine my interest in endocrinology with cancer genetics by investigating the effects of estrogen and progesterone on neurofibroma development associated with neurofibromatosis type 1. Later, as a fourth-year medical

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The experiences that led me to pursue a career as a physician scientist in the field of endocrinology exemplify the multi-disciplinary nature of endocrinology, which is something I continue to appreciate.

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student, I had the privilege of rotating with endocrinologist Dr. Laurence Kennedy in the multi-disciplinary pituitary clinic. I was hooked! Seeing patients with acromegaly and Cushing's disease with Dr. Kennedy and the neurosurgeons and radiation oncologists all at the same time was fascinating. I knew these were "my people," so to speak. I moved on to an internal medicine residency at Beth Israel in Boston, which solidified my passion for endocrinology.

During my endocrinology fellowship at the University of Pennsylvania, I was fortunate to have many mentors both in and outside of endocrinology. Dr. Peter Snyder was and continues to be one such mentor. I remember my fellowship interview with Dr. Snyder very well. He immediately made me feel at ease by sharing that he had trained at Beth Israel as well (and he didn't mention it was "before the merge").

EDITOR'S NOTE: The opinions and views of the author do not necessarily represent those of *Endocrine News* or the Endocrine Society.

He spoke about his prior laboratory research in pituitary disease, and we discussed clinical trials for treatment of pituitary disorders. I knew I would have excellent training in neuroendocrine disorders if I could train with Dr. Snyder. I also recognized the excellent training I would receive in thyroid neoplasia with Dr. Susan Mandel. Among many other things, both Drs. Snyder and Mandel taught me how to effectively and empathically care for patients living with endocrine cancer. In addition, Dr. Mandel has been a champion mentor for me. She was the first to recommend that I become involved with the Endocrine Society, thus leading me to my professional home.

During my fellowship, I learned about the high hereditary component to pheochromocytomas and paragangliomas, with up to 35% – 40% of patients with these tumors having a germline pathogenic variant increasing their risk of disease. However, very little was known about tumorigenesis and even less about metastatic disease. Researching this disease allows me to investigate the connection between germline and somatic genetics as it relates to cancer development and progression. With the guidance of my research mentor, Dr. Katherine Nathanson, a medical geneticist, and my clinical mentor, Dr. Debbie Cohen, a nephrologist, I developed a passion for neuroendocrine tumor patient care and research.

The experiences that led me to pursue a career as a physician scientist in the field of endocrinology exemplify the multidisciplinary nature of endocrinology, which is something I continue to appreciate. I work closely every day with colleagues in endocrine surgery, medical oncology, radiation oncology, cardiology, and medical genetics, to name a few.

Every patient is different, and the prevention and treatment we provide must be personalized for them, whether we are working with diabetes, thyroid disease, adrenal disorders, or endocrine cancers. This is why I love endocrinology. This field has allowed me to pursue my interest in cancer genetics by studying endocrine neoplasia.



Mary M. Lee, MD, Appointed Enterprise Chief Scientific Officer at Nemours Children's Health System



n December, it was announced that Endocrine Society member Mary M. Lee, MD, had been appointed enterprise chief scientific officer for Nemours Children's Health System, a multi-state pediatric health system.

Lee will oversee and lead the organization's efforts in developing better treatments and new cures to help tomorrow's children.

Nemours' research operations have been a pillar of the organization's efforts in battling disease and improving the lives of children by helping to advance lifechanging medical care. In addition to a strong commitment to basic science and clinical research, Nemours has been a leader in digital health, with nearly 30 years of continuous electronic health records, and a telemedicine infrastructure. While these tools have been primarily tapped for clinical care, Nemours' research has begun to identify novel ways to utilize these tools to make pediatric research more efficient, as well as reduce the burdens on patients and families.

"In order to provide the best care possible for children and to be a world-class children's health system, we need to couple the delivery of state-of-the-art patient centered care with rigorous scientific inquiry and discovery research," Lee says. "I am excited to advance these efforts and further embed discovery and innovation in our clinical practice to help us to transform pediatric healthcare."

Prior to joining Nemours, Lee served as physician-in-chief, and professor and Stoddard Chair of Pediatrics at UMass Memorial Children's Medical Center and University of Massachusetts Medical School. She brings strong operational, financial and strategic leadership experience to Nemours, having served for 13 years in academic, clinical, and administrative leadership roles. Lee has a significant history of funded and published research, faculty recruitments and promotions, and is nationally recognized for her research in the field of endocrinology and her keen interest in mentoring others.

Beyond her professional appointments, Lee has invested her time and energy in the scientific community having chaired several study sections at the National Institutes of Health (NIH) and served on the Scientific Advisory Council for National Institute of Environmental Health Sciences at NIH. She is the immediate past-president of the Pediatric Endocrine Society, a past-president of the American Society of Andrology, and is an active member of the Association of Medical School Pediatric Department Chairs, American Pediatric Society, and the Society for Pediatric Research. She has also routinely been recognized among the Best Doctors of America (2005-2018), and Top Pediatricians in America (2012-2015).

INTOUCH



HHN manager, Lynette Fludd (left) and HHN coordinator Karissa Charles welcome visitors to try their luck on the "signs & symptoms wheel," where participants test their knowledge of hormone disorders.

Hormone Health Network at DC Health & Fitness Expo

s the first winter snow fell in the DC Metro Area, Washingtonians gathered by the thousands to reenergize their health and fitness goals at the 26th annual NBC4 Health & Fitness Expo.

The Hormone Health Network, the patient education affiliate of the Endocrine Society, was onsite along with Society members from GW University Hospital educating the public on diabetes, menopause, and healthy eating. Attendees were able to pick up free resources, test their knowledge for premier prizes and find their local endocrinologist using the Network's physician directory.

This two-day event, which was held January 12 and 13 in the nation's capital offered a great opportunity for the Network to raise more awareness and improve public education about endocrine-related diseases and conditions.



Expo attendees looking at the various patient guides that the Hormone Health Network had to offer.



BY DEREK BAGLEY Senior Editor



The published literature is limited by inconsistent methodologies for assessing physical performance, by very short postoperative follow-up duration, and, often, by small sample sizes. Gastric Bypass Surgery May Benefit Muscle Strength More than Previously Thought

astric bypass surgery improves relative muscle strength and physical performance in people with obesity, according to a study recently published in *The Journal of Clinical Endocrinology & Metabolism*.

Researchers led by Anne L. Schafer, MD, of the University of California, San Francisco, point to a recent review that suggested physical performance improves after bariatric surgery, but it was unclear whether those results stemmed from changes in body composition after the surgery or increased physical activity or other factors. "In addition, the published literature is limited by inconsistent methodologies for assessing physical performance, by very short postoperative follow-up duration, and, often, by small sample sizes," the authors write. "Furthermore, studies addressing the effects of bariatric surgery on body composition or physical performance generally have not concurrently assessed muscle strength, physical activity, and a wide range of hormonal and dietary factors that may influence performance."

So the team wanted to characterize the effects of Roux-en-Y gastric bypass (RYGB) — the most common bariatric procedure in recent years — on lean mass, muscle strength, and objective measures of physical performance. RYGB is already widely accepted as an effective short- and long-term weight loss intervention for morbid obesity, leading to a reduction in all-cause mortality and improvement in obesity-related comorbidities including type 2 diabetes mellitus, dyslipidemia, and obstructive sleep apnea. "We also examined potential predictors of these outcomes, including hormonal changes and changes in physical activity and dietary protein intake," the authors write. "We hypothesized that despite the loss of lean mass after RYGB, muscle strength relative to body mass would increase, as would physical performance."

In the prospective cohort study, researchers examined the body composition, handgrip strength, physical activity, and physical performance of 47 obese adults before and six and 12 months after gastric bypass surgery. They found that dramatic weight loss causes a decline in a person's lean mass and absolute grip strength after surgery. However, relative muscle strength, walking speed, and other measures of physical function improved meaningfully in these patients.

"Our research found while Roux-en-Y bariatric surgery patients are likely to see the maximum amount of strength they can exert decline as they lose weight, they actually see an increase in their relative strength — a measure of strength relative to their size," says the study's first author, Diana Alba, MD, of the University of California, San Francisco. "Our participants' physical performance also improved following surgery. The findings suggest that postoperative loss of muscle mass and absolute strength may not be a meaningful problem."

Findings: The authors write that they speculate the improvements in physical performance after RYGB could be due to changes in biomechanics that result from substantial weight loss, which make it easier for people to move around. "The magnitude of the physical performance improvements is clinically significant and suggests that RYGB improves a person's ability to perform activities of daily living."

"Having good muscle strength and physical function is essential to helping people carry out their day-to-day lives," Alba says.

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TRENDS & INSIGHTS

Researchers Provide Baseline Characteristics of Infants with Atypical Genital Development

team of researchers has provided baseline characteristics for infants with atypical genital development born in the U.S., according to a paper recently published in the *Journal of the Endocrine Society*.

The researchers, led by Amy B. Wisniewski, PhD, of Cook's Children's Hospital in Fort Worth, Texas, write that little is known about the phenotypes, diagnoses, and sex of rearing practices of infants who present with atypical genitalia to clinics in the U.S. They point out that the 2006 Consensus Statement changed the approach for individuals with many types of 46,XY disorders of sex development (DSDs), who would have previously been assigned a female gender, to recommend male rearing. "As a result of these recommendations, the male sex designation has been increasing in Europe," the authors write. "It is unknown, however, whether sex is being assigned according to the consensus recommendations in the United States."

The researchers initially enrolled 99 subjects with moderate-to-severe genital atypia, aged <3 years, who had not undergone previous genitoplasty. Six withdrew, and one did not have a documented karyotype. "Of the 92 children, 53 (57%) had a 46,XX karyotype, 31 (34%) had a 46,XY karyotype, and 8 (9%) had [sex chromosome abnormality]. Of those with a 46,XX karyotype, the most common diagnosis was congenital adrenal hyperplasia



(CAH) due to 21-hydroxylase (21-OH) deficiency (21-OH CAH; 48 of 53)," the authors write.

Two of the subjects with CAH underwent a change in sex of rearing from male to female within two weeks of birth. The researchers found that the presence of a uterus and a shorter phallic length were associated with the child being raised female, meaning future fertility could factor into the decision of sex of rearing or surgery.

Findings: Based on their findings, the authors conclude: "An increased phallic length was positively associated with rearing male. Among the U.S. centers studied, sex designation followed the Consensus Statement recommendations. Further study is needed to determine whether this results in patient satisfaction."



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66 Our results suggest that duration of infertility should be considered a potential risk factor for impaired sperm parameters in infertile men. Also, infertile couples should be made aware of the associations found in this study.



Duration of Infertility in Men May Affect Sperm Count

longer duration of infertility was associated with lower sperm count and other parameters of impaired sperm, according to a study recently published in *BJU International*. The study also shows that older age and higher body mass index were associated with a longer duration of infertility.

Researchers led by Andrea Salonia of the Division of Experimental Oncology/Unit of Urology, URI-Urological Research Institute, IRCCS Ospedale San Raffaele, University Vita-Salute San Raffaele in Milan, Italy, point out that approximately 15% of couples of reproductive age fail to achieve a wanted pregnancy within a 12-month period, despite regular unprotected sexual intercourse. Prolonged infertility has been considered a psychosocial stress for the infertile couple that may lead to poor marital adjustment and decreased quality of life, but the potential role of the duration of infertility in terms of the couple's reproductive health remains understudied.

The researchers analyzed data from 1,644 infertile men. "Patients were grouped according to the self-reported [duration of infertility (DI)] into 12-month time frames," the authors write. "Semen analysis values were assessed based on 2010 World Health Organization reference criteria. Descriptive statistics tested the difference in clinical, hormonal and seminal parameters between groups. Logistic regression models assessed the impact of DI on semen parameters."

The group found that a DI of <12, 13–24, 25–36, 37–48, 49–60, and >60 months was found in 207 (12.6%), 651 (39.6%), 387 (23.5%), 168 (10.2%), 92 (5.6%) and 139 (8.4%) men, respectively. Patients' age (P < 0.001) and body mass index (P < 0.001) significantly increased along with DI. Hormonal



values were similar across the groups. The authors write: "Sperm concentration significantly decreased with DI (P = 0.01). Similarly, a higher rate of non-obstructive azoospermia (NOA) was more frequently found in men with a longer DI (P = 0.03). There were no differences in semen volume, sperm progressive motility, total motile sperm count (TMSC), and normal morphology across groups. Multivariable logistic regression analysis showed that DI was significantly associated with the risk of oligozoospermia (P < 0.001), TMSC <5 × 106 (P < 0.001), and [non-obstructive azoospermia (NOA)] (P < 0.001)."

Based on these results, the authors conclude: "This cross-sectional study showed that DI had a negative impact on semen parameters in primary infertile men. Sperm concentration was negatively associated with DI and patients with a longer DI reported higher rates of azoospermia. Furthermore, DI was significantly associated with a higher risk of oligozoospermia, low [total motile sperm count], and NOA."

Findings: "Our results suggest that duration of infertility should be considered a potential risk factor for impaired sperm parameters in infertile men. Also, infertile couples should be made aware of the associations found in this study," says lead author Luca Boeri, of IRCCS San Raffaele Hospital and University Vita-Salute San Raffaele."

Study Shows that Individual Genetic Variation Can Predict Response to Anti-Diabetes Drugs

ndividual genetic variation can be used to predict whether rosiglitazone will produce the unwanted side effect of increasing cholesterol levels in certain individuals, according to a study recently published in *Cell Stem Cell*.

Researchers led by Mitchell Lazar, MD, PhD, director of the Institute for Diabetes, Obesity, and Metabolism in the Perelman School of Medicine at the University of Pennsylvania in Philadelphia, point out that while thiazolidinediones (TZDs) reverse insulin resistance in patients with type 2 diabetes by targeting the activity of a receptor protein, an array of side effects, including weight gain, edema, and high cholesterol, limits their use in the clinic.

"Obesity has reached global epidemic proportions and is a major risk factor for type 2 diabetes, so any steps we can take toward understanding how patients respond to treatment is crucial," Lazar says. "We



found that genetic variation impacts how PPARγ [a receptor protein] interacts with the genome DNA in fat cells. This determines an individual's responses to anti-diabetic drugs and has direct implications for developing personalized therapies for diabetes."

By studying the genome of fat cells derived from patients treated at Penn Medicine, Lazar's team discovered a genetic variation that predicted whether rosiglitazone would increase expression of a gene called *ABCA1*, which regulates cholesterol levels. The variation does not appear in the protein-coding region of the *ABCA1* gene but is found in regions that code for molecules that regulate the level of *ABCA1* expression. The team demonstrated the causal relationship between the genetic variation and increased *ABCA1* expression by editing the variant from its inactive form to the active one using CRISPR/Cas9.

The ability of the active variant to predict whether rosiglitazone treatment will increase cholesterol was confirmed by studying 84 patients treated with the drug in Shanghai. While the overall effects of TZDs are clearly governed by many genes, the Penn study showed that individual genetic variations can predict effects of drugs on gene expression and metabolic physiology.

"Understanding the underlying mechanism driving a differential response to TZDs could inform personalized and precision approaches to treating type 2 diabetes," Lazar says. "Doctors could test for this genetic variation and choose to avoid rosiglitazone treatment of diabetic patients whose genes predict that the drug would have a greater chance of increasing their serum cholesterol levels."

Findings: These principles can be applied not only to TZDs but more broadly to other classes of drugs that work at non-coding regions of the genome, including those targeting steroid hormone receptors. The hope is to be able to predict which patients will have beneficial versus detrimental responses to drugs for tailoring drug therapy for individuals.



66

Obesity has reached global epidemic proportions and is a major risk factor for type 2 diabetes, so any steps we can take toward understanding how patients respond to treatment is crucial.



ENDOCRINE ITINERARY



New Orleans, Louisana March 23 – 26, 2019

KEY DATE: HOUSING DEADLINE February 22, 2019

With more than 7,000 attendees, nearly 2,000 abstracts, and more than 200 other sessions, ENDO 2019 is the leading global meeting for endocrinology research and clinical care. Join us for the most well attended and valued translational endocrinology meeting in the world. Bringing together leading experts, researchers, and the most respected clinicians in the field, ENDO 2019 represents a convergence of science www.endocrine.org/endo2019

and practice that highlights and facilitates breakthrough discoveries in the field of endocrinology. Spend time connecting with peers and colleagues, exchanging ideas and information, and getting out in front of the latest trends and advancements in hormone health. The meeting also hosts other satellite and pre-conference events.

MEN 2019: 16th International Workshop on Multiple Endocrine Neoplasia

Houston, Texas, March 26 - 29, 2019 In keeping with the spirit of the original MEN workshop, MEN 2019 will focus on emerging topics in the genesis and therapy of malignant endocrine tumors associated with multiple endocrine neoplasia. The goal of the workshop will be to provide an outline for basic and clinical research focused on these malignant manifestations. The meeting will bring together local and international experts on multiple endocrine neoplasia to focus on these subjects. A significant portion of the meeting will be spent in workshops centered on emerging topics and the

development of an international roadmap for future research and clinical trials. and the remainder of the meeting will be composed of large group didactic sessions.

https://www.mdanderson.org/conference

Endocrine Fellows Series: Type 1 **Diabetes Care and Management** New Orleans, Louisiana March 19 - 21, 2019

This comprehensive conference is for adult and pediatric endocrine fellows interested in type 1 diabetes. The unique and highly sought-after program is an opportunity to learn from leaders in the field through interactive sessions. The curriculum is specially designed to support early-

career endocrinologists by enhancing skills with comprehensive education not typically taught in fellowships and providing the opportunity to connect with thought leaders and peers. https://www.endocrine.org/T1Dfellows

International Pituitary Congress New Orleans, Louisiana March 20 - 22, 2019

The Sixteenth International Pituitary Congress will present an exciting group of member and guest international experts in pituitary problems. It will include distinguished clinicians and clinical researchers, fellows in training, and experts in basic science. There will be cutting-edge in-depth topics that will permit each attendee to

ENDOCRINE ITINERARY

become familiar with the latest trends in pituitary endocrinology. The format of the meeting is intended to facilitate maximum interaction and free exchange of ideas among the participants and speakers. http://pituitarysociety.org

Society for Inherited Metabolic Disorders (SIMD) 41st Annual Meeting

Bellevue, Washington, April 6 – 9, 2019 The SIMD meeting will feature a half-day joint session with the American College of Medical Genetics and Genomics. Topics discussed include novel IEMs and treatments, diagnosis of IEMs, complementary use of genomics and metabolomics, and a satellite session on cerebral creatine deficiency syndromes hosted with the Association for Creatine Deficiencies.



2019 Clinical Endocrinology Update

Seattle, Washington September 19 – 21, 2019

Each year CEU brings together hundreds of endocrine clinicians for a unique learning experience and opportunities to network with expert faculty and colleagues. Attend the 71st CEU to receive the most trusted and clinically relevant information about recent advances in the field of endocrinology. The educational programming at CEU appeals to clinicians at all levels of practice, as well as fellows and other members of the clinical practice team. https://www.endocrine.org/ceu

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INTERNATIONAL ITINERARY

ATTD 2019

Berlin, Germany, February 20 – 23, 2019

The 12th International Conference on Advanced Technologies and Treatments for Diabetes (ATTD 2019) focuses on technology in diabetes and how healthcare professionals and patients can use those technologies for the best outcomes in treatment. International experts will discuss breakthroughs in diabetes treatments, technological innovations, and showcase the latest developments in new insulin analogues, delivery systems, pumps, glucose sensors, closed-loop systems, and much more. Featuring the International Fair of New Technologies, this conference will highlight start-ups and emerging companies displaying cutting-edge technologies.

https://attd.kenes.com/2019#.W9CXKIWnHbg

Thyroid Fest®

Mazatlan, Mexico, April 4 – 6, 2019

Thyroid Fest® is a celebration of knowledge born from the efforts of an international and interdisciplinary team aiming to promote comprehensive education in the area of thyroid health. The Thyroid Fest leadership team is composed of Latin American doctors with world-class training that include endocrinologists, pathologists, radiologists, and endocrine surgeons who believe that teamwork from the point of view of each specialty makes a significant difference in thyroid patients and, in turn, contributes to healthcare science.

www.thyroidfest.org

World Peptide Congress

Tokyo, Japan, April 17 – 18, 2019

The World Peptide Congress will bring together world-class biochemists, scientists, professors, and scholars to concentrate on "Accelerating Current Innovations in Peptide Research." Peptides play important roles in living body systems by controlling, directing, and coordinating inter- and intra-cellular communications and cellular function, and this conference will focus on the latest stimulating patterns and advancements in the field of peptide science.

https://www.meetingsint.com/conferences/peptide

Keystone Symposia on Immunometabolism and Metaflammation and Metabolic Disorders

Vancouver, BC, Canada, April 14 - 18, 2019

This conference will cover the molecular mechanisms and physiological outcomes of immunometabolic interactions in the context of chronic metabolic diseases. www.keystonesymposia.org/19D6

9th International Conference on Children's Bone Health Salzburg, Austria, June 22 - 25, 2019

ICCBH meetings provide an international forum for the presentation and discussion of current basic and clinical science in the field of bone metabolism and bone mass in children, adolescents, and young adults. The conference topics will include bone and mineral metabolism, development, pediatric endocrine practice, among others. (20 CME credits offered)

www.iccbh.org

Artificial intelligence - once only found in a Steven Spielberg movie – is being adapted by the healthcare industry more and more from improving diabetes outcomes to reducing unnecessary thyroid surgeries. As these technologies improve, clinicians will soon have yet another ally to individualize patient care.

rtificial intelligence. Machine learning. Those very phrases stir up Philip K. Dick's paranoid vision of replicants or the eerie, calm voice of Stanley Kubrick's sadistic spacecraft control system.

But it's best to leave the more ominous connotations of machine learning where they belong: in the realm of science fiction. Here, at the beginning of 2019, the world is seeing a rise in new technologies that employ artificial intelligence and machine-learning techniques — apps that use algorithms to predict when someone might be craving pizza; self-driving cars that learn not only what other cars might do on a busy highway, but whether a pedestrian might walk when it's not his or her turn; robots that can do parkour. Several in the healthcare industry and in clinical settings are already seeing the benefits from this brave new world, and they're hoping to soon pass these benefits on to patients, especially as personalized, individualized medicine becomes the standard for optimal care.

BY DEREK BAGLEY





I think the biggest thing is to understand how cutting-edge molecular diagnostics are improving care. And I think with continual evolution of these tasks, they're improving. And we are also increasingly individualizing care to each specific patient."

- ERIK ALEXANDER, MD, CHIEF, THYROID SECTION OF THE DIVISION OF ENDOCRINOLOGY, DIABETES AND HYPERTENSION, BRIGHAM AND WOMEN'S HOSPITAL, BOSTON, MASS. For example, several thyroid experts recently presented their findings from real-world data they collected using a new version of a test that uses machine learning to determine whether nodules were benign or malignant. The goal here is to increase the identification of benign nodules and save patients from the risk and expense of unnecessary surgeries. This test uses an ecosystem of algorithms to analyze data from deep ribonucleic acid (RNA) sequencing so that it can leverage more enriched and previously undetectable genomic information.

"We are employing the same machine-learning methods that are being used in other fields such as social media and self-driving cars, but applying them to thyroid cancer diagnosis," says Giulia C. Kennedy, PhD, chief scientific officer of Veracyte, the company marketing the aforementioned test as the Afirma Genomic Sequencing Classifier. "Our approach uses ribonucleic acid (RNA) sequencing to interrogate the entire genome, and takes advantage of newer methods in machine learning to combine valuable features that provide a higher-resolution genomic picture of thyroid nodules." Advances using artificial intelligence are being made in diabetes care as well; new devices and apps that help patients control their glucose levels are being developed and brought to market at an ever-increasing pace. One of these new apps is called Sugar.IQ, the result of a partnership between IBM Watson Health and Medtronic. The app works in tandem with Medtronic's Guardian Connect Continuous Glucose Monitor and is designed to learn a patient's patterns and habits so that the app can predict a high or low and the patient can make better decisions for self-care.

"Sugar.IQ as an artificial intelligence will get to know your patterns over time," says Lisa Latts, MD, deputy chief health officer at IBM Watson Health. "We're basically creatures of habit, and we tend to eat the same things over time. We tend to get the same amount of exercise at the same time of day. And as it gets to know you through the artificial intelligence components it starts to be able to surface insights about your patterns and whether you're likely to develop a very high blood sugar after something that's coming up or develop a very low sugar. And then you can take action based on those insights with a goal of spending more time in range."

Patients with suspicious thyroid nodules and patients with diabetes (especially type 1 diabetes) are seeing positive results using these technologies that can learn and predict and prevent adverse health outcomes. As we welcome 2019, we'll take a look at what insights physicians using these products are gaining and what those insights might mean for the future of tailored endocrine care.

Reducing Unnecessary Thyroid Surgery

Researchers at Cleveland Clinic wanted to determine just how well the Afirma Genomic Sequencing Classifier (GSC) performs, or, more specifically, how much of an improvement the GSC is over its predecessor, the Gene Expression Classifier (which didn't use machine-learning techniques). They compared results of 46 samples tested with the GSC between July 2017 and December 2017 with 182 samples tested with the GEC between December 2011 and July 2017and found that the GSC identified 67.4% as benign, compared to 41.8% with the GEC — an increase of 61.0%. The overall surgery rate for nodules tested with the GSC was 32.6%, compared to 47.3% with the original test, a decrease of 31.0%. The results were presented in Washington, D.C., at the annual meeting of the American Thyroid Association.

The researchers looked mostly at thyroid nodules in the Bethesda 3 and Bethesda 4 categories, where the risk of malignancy ranges from about 20% to 50%, according Christian Nasr, MD, medical director of the Thyroid Center in the Endocrinology & Metabolism Institute at Cleveland Clinic. "We looked at how the GEC helped us, until we switched to GSC," he says. "Then we compared our outcomes of GSC compared to GEC. We actually found more benign rates with the GSC, which seems to detect more benign signatures, if you will, compared to the GEC. We're relying on machine-learning technology. Based on our findings



AT A GLANCE

- The healthcare industry is incorporating artificial intelligence and machine-learning techniques into more and more products.
- Here we look at a test that's able to deem more thyroid nodules benign, thereby saving patients from unnecessary surgeries, and an app that "learns" patients with diabetes' patterns and helps them spend more time in target range.
- As these new technologies continue to improve, physicians can increasingly individualize care to each of their patients.

5 6 There is a role for artificial intelligence in managing diabetes and helping to make some of the decisions that an individual has to make a little bit easier. Using artificial intelligence, we're able to lead to more time in the target range for individuals on multiple daily injections, which is the ultimate goal of diabetes care. So fewer episodes of hypoglycemia and fewer time in hyperglycemia."

- LISA LATTS, MD, DEPUTY CHIEF HEALTH OFFICER, IBM WATSON HEALTH

and those of others, we believe that this is a useful technology. We are planning to monitor patients who did not have surgery to make sure those nodules are still benign long term."

Investigators at Brigham and Women's Hospital in Boston conducted a similar study, evaluating results for 583 thyroid nodules tested with either the GSC (n=97) or GEC (n=486) between 2011 and 2018. They found that the GSC identified 64.9% of nodules as benign, compared to 47.9% with the GEC, an increase of 35.0%.

"We've used the GEC for many years and found it to be very useful in reducing a lot of unnecessary surgery," says Erik Alexander, MD, chief in the Thyroid Section of the Division of Endocrinology, Diabetes, and Hypertension at Brigham and Women's Hospital. "And now the GSC has been out for a bit of time, and we wanted to understand its performance. When we analyzed a large series of patients, we found, first, that the proportion of patients that had a benign result was higher with the GSC."

Alexander goes on to say that this updated test improved the ability to help analyze and deal with the unique population of hurthle cell neoplasms. "In the past, there has been some difficulty in adequately identifying if those were benign or malignant," he says. "So this updated version does appear to have significantly improved the ability to detect those cancers."

Better Diabetes Outcomes

In April 2017, 256 Medtronic MiniMed Connect users were invited to take part in a 90-day Sugar.IQ app pilot program, during which researchers looked at the percentage of time in target range (TIR, 70-180 mg/dL), <70mg/dL, >180mg/dL, and excursions (periods >20 minutes and <70mg/dL or >180mg/ dL) 30 days before Sugar.IQ onboarding, and compared to those results to results from 90 days later, in August 2017.

The researchers collected 10,761 unique Sugar.IQ usage sessions out of 11,356 sensor-wear days and identified behaviors associated with excursions. The Sugar.IQ app was used about twice a day, and the researchers found that compared to baseline, participants were in range about 36 minutes more per day and hypoglycemia events were reduced by one per month. The researchers found that users were able to make better decisions about bolusing and carb consumption after gaining insights from the app.



Veracyte's Afirma Genomic Sequencing Classifier uses RNA sequencing and machinelearning methods to provide a clear genomic picture of thyroid nodules, helping patients avoid unnecessary surgeries.

The researchers, led by Yuxiang Zhong, the data science manager for Medtronic Diabetes, concluded that "[t]imely and personalized insights, such as those provided during the Sugar.IQ pilot, may advance patient understanding of glucose trends, aid in behavioral change that improves therapy adherence, and lead to better outcomes." The results were presented at the American Diabetes Association's annual meeting this past June in Orlando.

"[Thirty-six minutes a day] adds up to nine extra days per year where you are totally in range," Latts says. "The presumption is that by spending more time in range and less time in the highs and less time in the lows, you will develop better glucose control overall and then that again presumably will lead to lower complications, lower episodes of hypoglycemia requiring hospitalization or ER use, and will lead to better overall outcomes in care of an individual with diabetes."

Improving and Individualizing Care

Patients would certainly prefer to avoid a surgery they don't need or a hypoglycemic episode such as fainting in traffic and applying artificial intelligence to already existing therapies and tests can work to show that an ounce of prevention is indeed worth more than the cost of a trip to the emergency room or time lost while recovering from a lobectomy.

"We don't want to send patients to have surgery that could be avoided," Nasr says. "Our surgeons are excellent surgeons. They're high-volume surgeons, every one of them. Still, if someone can avoid surgery from the anxiety to having surgery, to the anesthesia, to the cost, to the possible, although remote risk of vocal cord damage, or even hematoma. I think by using this, for me, for our group here, for the Society, I think this is going to help all of us avoid sending patients unnecessarily to have a lobectomy, just by using this [test]."

Now more than ever, patients should be able to make better medical and lifestyle decisions, especially with the help from a device or a test that is able to rapidly learn and relearn about an individual and tailor a plan that works best for them.

"There is a role for artificial intelligence in managing diabetes and helping to make some of the decisions that an individual has to make a little bit easier," Latts says. "Using artificial intelligence, we're able to lead to more time in the target range for individuals on multiple daily injections, which is the ultimate goal of diabetes care. So fewer episodes of hypoglycemia and fewer time in hyperglycemia.

"I think the biggest thing is to understand how cutting-edge molecular diagnostics are improving care," Alexander says. "And I think with continual evolution of these tasks, they're improving. And we are also increasingly individualizing care to each specific patient."

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- BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. HE WROTE THE OCTOBER COVER STORY ABOUT THE EFFECTS OPIOIDS CAN HAVE ON VARIOUS ENDOCRINOPATHIES.



END©2019 Preview

Stephen M. Rosenthal, MD, Micol S. Rothman, MD, and Joshua D. Safer, MD, FACP, talk to *Endocrine News* about their **ENDO 2019** Meet-The-Professor session on treating transgender patients and how they hope to further educate endocrinologists who are more likely than ever before to encounter these types of cases.

BY DEREK BAGLEY



Stephen M. Rosenthal, MD



Micol S. Rothman, MD



Joshua D. Safer, MD, FACP

D NDO 2019 is next month, and that means it's time to start solidifying plans for New Orleans — restaurants in which to dine, jazz clubs in which to cut loose, sessions to attend. One of the highlights this year is a Meet-The-Professor session on Monday, March 25, titled "Challenging Cases in the Endocrine Management of Gender Dysphoria/Gender Incongruence."

As the name suggests, the 45-minute session will feature three cases of endocrinologists treating transgender patients, pediatric and adult, presented by three leaders in the field: Stephen M. Rosenthal, MD, professor of pediatrics and medical director of the Child and Adolescent Gender Center at the University of California, San Francisco; Micol S. Rothman, MD, associate professor of medicine and co-founder of the UC Health Integrated Transgender Program at the University of Colorado School of Medicine in Aurora; and Joshua D. Safer, MD, FACP, executive director of the Center for Transgender Medicine and Surgery at Mount Sinai Health and Icahn School of Medicine at Mount Sinai in New York, N.Y.

This is a relatively new field in endocrinology, but it's growing quickly, as more people are identifying as transgender and becoming comfortable enough to see physicians for their care. A June 2016 study from the University of California Los Angeles School of Law's Williams Institute found that about 0.6% of the U.S. adult population identifies as transgender. "This figure is double the estimate that utilized data from roughly a decade ago and implies that an estimated 1.4 million adults in the U.S. identify as transgender," the authors (Flores, et al.) write.

Primary care providers can take care of many transgender patient needs, but our role is to be experts in hormone management and serve as consultants for more challenging cases. This is what we are trained in and what we do well. I would love to see more endocrinologists on the forefront of research and education in this area."

— MICOL S. ROTHMAN, MD, ASSOCIATE PROFESSOR OF MEDICINE; CO-FOUNDER, UC HEALTH INTEGRATED TRANSGENDER PROGRAM, UNIVERSITY OF COLORADO SCHOOL OF MEDICINE, AURORA, COLO. But while the number of individuals identifying as transgender or gender non-conforming grows, the fact remains that these individuals still face barriers to optimal care, whether they report mistreatment or negative experiences with their healthcare providers, are denied insurance coverage for transition-related treatment or medications, or fear seeking medical care at all.

It is still the case that transgender people report unknowledgeable providers. However, where 10 years ago, the norm might have been for endocrinologists to look for centers where their patients might go, more often now endocrinologists are keeping the patients and simply asking for guidance with challenging situations."

- JOSHUA D. SAFER, MD, FACP, EXECUTIVE DIRECTOR, CENTER FOR TRANSGENDER MEDICINE AND SURGERY AT MOUNT SINAI HEALTH AND ICAHN SCHOOL OF MEDICINE AT MOUNT SINAI, NEW YORK, N.Y.

The presenters point out that a 2017 Mayo Clinic and Endocrine Society anonymous survey showed that of the practicing U.S. Society members who responded, 80% had treated a transgender patient but 81% had never received training in transgender health management. Endocrinologists have the opportunity to be the go-to resource for transgender patients, and as the transgender population grows, so too does the likelihood that a practicing endocrinologist will treat a transgender patient. *Endocrine News* caught up with Rosenthal, Rothman, and Safer to discuss their presentations and the Endocrine Society's role in optimizing care of transgender patients.

ENDOCRINE NEWS: Since this is a preview of the upcoming Meet-The-Professor session, what can you share about your talk?

ROSENTHAL: There's been a longstanding commitment of the Endocrine Society, recognizing that the number of people seeking services who identify as transgender has steadily increased. I'm a pediatric endocrinologist. The patients that we see range from toddlers, whose parents are not seeking medical services, but primarily emotional support, all the way through young adults. We take new patients up to about 21, and then we'll follow patients into their mid-20s.

We came up with three cases. One of them is more pediatric adolescent focused; the others are more adult focused. I think that the idea would be that each of the three of us would lead a discussion on one of the three cases. Then, work together as a panel to provide different perspectives on different questions that would come up as people bring their own concerns or questions to the discussion.

ROTHMAN: We will cover some of the basics of genderaffirming hormone therapy (GAHT), but we will present three more complex cases for discussion that address some of the less well studied aspects of GAHT that many endocrinologists are seeing in their practice such as: adolescent patients, nonbinary patients, and patients who may ask about regimens they learn about online.

SAFER: Because endocrinologists are likely to be called in for more difficult hormone treatment decisions for transgender individuals, the session is meant to provide an opportunity to talk through scenarios that might arise.

EN: How do you view the current state of the care of transgender people?

ROSENTHAL: If you're a patient, it's a bit anxietyprovoking if you feel, because maybe of your own background work, that you end up knowing more about what you need than the provider that you're going to end up seeing. It just underscores the need for increased training or educational opportunities.

ROTHMAN: Although many endocrinologists are now providing GAHT, data suggest they still desire more education and training to feel comfortable with caring for gender-diverse patients. A recent survey of fellows who attended Endocrine University indicates that trainees consider this an important area, and one where they would like more didactics sessions and clinical experience. (*Endocrine Practice* 2018, Davidge-Pitts, et al.).

SAFER: It is still the case that transgender people report unknowledgeable providers. However, where 10 years ago, the norm might have been for endocrinologists to look for centers where their patients might go, more often now endocrinologists are keeping the patients and simply asking for guidance with challenging situations.

EN: What are some gaps or potential pitfalls that need to be addressed, short term and long term?

ROSENTHAL: I can give you an insight on the pediatric and adolescent side of this. For early pubertal youth and for adolescents, all of these medications involved in gender care are "off-label." Some estrogen and testosterone preparations are not that expensive, but pubertal blockers are.

Puberty takes three-and-a-half to four years from start to finish. If you put somebody on a blocker after they've been in puberty for maybe six to 12 months, you're still intervening at a relatively early stage in the whole process. Typically, before the person has developed some of what are often thought of as irreversible physical characteristics. One of the benefits of a blocker is if it's used early enough after puberty has started, you can avoid having to go all the way through the wrong puberty and prevent experiencing some of the irreversible physical changes associated with that.



No one ever recommends using a pubertal blocker in a really young kid to try to prevent the onset of puberty. A pubertal blocker is never meant to block the onset of puberty. It's just meant to block the progression of puberty once it's started because once it's started, then there's a much greater predictability of that person's gender identity.

These medicines have been used for more than three decades for a different clinical context, which is the treatment of precocious puberty. [Pubertal blockers] are approved for precocious puberty, but they're not currently FDA-approved for use in transgender youth. These are not inexpensive medications. They could be in the \$20,000 to \$30,000 range, and some insurance companies will deny them. That is the kind of thing that isn't really highlighted in the Endocrine Society clinical practice guidelines. You might have somebody coming in who says, "I'm having trouble getting access. What do you recommend?" Those are the kinds of things that we'll talk about, because there are other approaches.

ROTHMAN: Many patients still do not have access to knowledgeable providers. Survey data indicates that many patients still are denied care by insurers or providers, and negative experiences in a healthcare setting are unfortunately still all too common. There are data that suggest access to a trans-inclusive provider can help ensure patients have primary care needs met, such as wellness checks or cholesterol screening.

SAFER: One of the current challenges is addressing the Internet myths that have developed in a field neglected by the medical establishment. Gaining the credibility to push back on problematic Internet myths will be important.

If you're a patient, it's a bit anxiety-provoking if you feel, because maybe of your own background work, that you end up knowing more about what you need than the provider that you're going to end up seeing. It just underscores the need for increased training or educational opportunities."

- STEPHEN M. ROSENTHAL, MD, PROFESSOR OF PEDIATRICS; MEDICAL DIRECTOR, CHILD AND ADOLESCENT GENDER CENTER, UNIVERSITY OF CALIFORNIA, SAN FRANCISCO

Another challenge is to avoid getting lulled into believing that holding estrogen will actually protect a patient from thrombosis risk. The risk of thrombotic event from estrogens is small. If a patient has significant thrombosis risk, simply holding estrogens may not only be unnecessary, it also is likely to be insufficient, with the patient requiring a more serious protective intervention.

EN: What do you hope attendees will take away from your presentation?

ROSENTHAL: Maybe some reduced discomfort, having gained a bit more knowledge. There are likely two groups of people that will be there: Some who haven't yet had the experience of providing care for a transgender person, and some who have and are looking to learn more. My hope would be that for each of those two groups, they feel that they've gotten something out of it.

ROTHMAN: My main hope is that endocrinologists will not only provide GAHT but become more comfortable taking leadership roles in this area. It is very exciting that Dr. Vin Tangpricha just began his term as president of the World Professional Association for Transgender Health, and many other endocrinologists are emerging as national and international leaders. There are many research questions that remain regarding long-term outcomes, best practices, and care of patients over the lifespan. Primary care providers can take care of many transgender patient needs, but our role is to be experts in hormone management and serve as consultants for more challenging cases. This is what we are trained in and what we do well. I would love to see more endocrinologists on the forefront of research and education in this area.

SAFER: Attendees should have increased confidence in approaching hormone treatment of transgender individuals. The session will allow attendees to see how current experts approach the more common conundrums in the field and test their own thinking for such circumstances.

- BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS.* HE WROTE ABOUT TARGETING CELLULAR SENESCENCE IN AGE-RELATED OSTEOPOROSIS IN THE JANUARY ISSUE.

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RENDING: New Guidance on Using Flash CGMs

BY ERIC SEABORG



H igh-tech options for diabetes management continue to proliferate so quickly that it can be difficult to keep up. The Food and Drug Administration approved Abbott's FreeStyle Libre flash glucose monitoring system late in 2017 — and the Endocrine Society has responded with new guidance for providers and patients on how to make the most of its feature of providing trend arrows to alert users to which way their glucose levels are headed.

In 2017, the Endocrine Society published a similar guidance for the first "trend arrow" continuous glucose monitoring (CGM) on the market, the Dexcom G5. Dexcom soon followed that model up with an even more advanced model, the G6, which requires no calibration by the user through fingersticks.

The FreeStyle Libre system comes in two versions, one designed for use over 10 days and one over 14 days, with neither system requiring calibration by the user.

The Libre differs from the Dexcom models in that the Dexcoms communicate with a reader device (including a cell phone) with no patient intervention, whereas the Libre requires the patient to scan a reader over the sensor — hence it is often referred to as a "flash" glucose monitoring system. The Libre systems also do not have the automatic alarms that are built into the Dexcom models.

The important feature that the two systems share is that in addition to glucose readings, they display trend arrows that alert users about whether their glucose levels are holding steady or heading up or down.

Glucose monitoring systems can provide information on trends in glucose levels that can be a key in making dosing decisions. Specific to the newest entry, the Endocrine Society has issued a usage guide to make life easier for both clinicians and patients.





Meeting the Need for Education

"There are more and more CGM options available, but there is a lack of educational materials for both patients and providers on how to use them" says Yogish Kudva, MD, of the Mayo Clinic, in Rochester, Minn., who chaired the panel that wrote the document. "This is the second initiative from the Endocrine Society to provide more educational material.



[This expert panel built on the experience of the previous panel] by developing patient educational material in parallel with the provider document."

For providers, "Approach to Using Trend Arrows in the Freestyle Libre Flash Glucose Monitoring System in Adults" was published in the December print edition of the *Journal of the Endocrine Society*, and for patients, the Society developed a web page about CGM systems in general and a downloadable brochure specific to the Libre: **hormone.org/cgm**.

Impact of Trend Information

These new systems are affecting treatment by showing the importance of putting glucose readings into the context of which way the level is headed, says L. Kurt Midyett, of St. Luke's Hospital of Kansas City, Mo., and a member of the guidance-writing committee. For example, glucose readings of 180 mg/dL can result in different actions, depending on the context. "If you put [the numbers] into the context of directionality, they are dramatically different. [You would take different actions] if you had a blood sugar of 180 that was rising very rapidly versus a blood sugar of 180 that was falling very rapidly versus a blood sugar of 180 that was very stable and flat. The number itself becomes immaterial. It

66 There are more and more CGM options available, but there is a lack of educational materials for both patients and providers on how to use them. This is the second initiative from the Endocrine Society to provide more educational material. [This expert panel built on the experience of the previous panel] by developing patient educational material in parallel with the provider document."

- YOGISH KUDVA, MD, MAYO CLINIC, ROCHESTER, MINN.; CHAIR, GUIDE WRITING PANEL

is the movement that we want to try to focus on. Someone might actually give themselves insulin if the blood sugar was rising very rapidly [and do the opposite if it were falling] to try to prevent a low blood sugar. Yet the number is exactly the same," Midyett says.

The information from a few fingersticks in a day provided only a snapshot of a patient's status, and "we couldn't figure out why a patient might have a completely opposite reaction to the same treatment," says Midyett. The information on how the patient's glucose was trending helps explain the diverse reactions.

Expert Opinion

Trending information is still so new that there is not a published evidence base for decision making, so the new guidance is based on the expert opinions from clinicians who have experience with patients using CGM systems. Hence, it is titled an "approach" instead of a guideline. But this lack of a formal evidence base could make the recommendations all the more important for clinicians who do not deal with the new technology every day and could use help in getting up to speed. The expert panel's work was supported by an unrestricted educational grant to the Endocrine Society from the Libre's manufacturer, Abbott Diabetes Care.

Developing recommendations on how to use the trend information is made more difficult by the fact that the Dexcom and Libre display different arrow combinations — the Dexcom has seven combinations compared with the Libre's five. (The



AT A GLANCE

- Following the Food and Drug Administration approval of another innovative continuous glucose monitoring (CGM) system for standalone use

 the FreeStyle Libre –
 the Endocrine Society has responded with guidance on using the system's "trend arrows" in insulin dosing.
- Diabetes experts are increasingly learning that insulin administration and management decisions should be based not simply on a glucose level but on information from these trend arrows — whether the glucose level is heading up, heading down, or holding steady.
- This guidance is the second the Endocrine Society has produced on a trend arrow device and contains even more information than the guidance for the Dexcom CGM model — including extensive recommendations related to physical activity and exercise.

RESOURCES

- "Approach to Using Trend Arrows in the Freestyle Libre Flash Glucose Monitoring System in Adults" is available here: https://academic.oup.com/jes/ article/2/12/1320/5181247
- General information for patients from the Hormone Health Network on CGM: https://www.hormone.org/ diseases-and-conditions/ diabetes/diabetes-management/ continuous-glucose-monitoring
- Patient guide to the Freestyle Libre: https://www.hormone.org/-/ media/hormone/files/diseasesand-conditions/diabetes/hhn_ libre_final1107.pdf?la=en

Our goal is to provide guidance that facilitates individualized recommendations for trend arrow use and data assessment. Our approach focuses on typical insulin sensitivity ranges used in adults and provides a range of adjustments in discrete insulin units. We believe this simplified approach reduces numeracy requirements and the number of calculations, which will help patients improve glucose control and increase glucose time in range without hypoglycemia, while promoting clinical discussion."

> – FROM "APPROACH TO USING TREND ARROWS IN THE FREESTYLE LIBRE FLASH GLUCOSE MONITORING SYSTEM IN ADULTS" PUBLISHED IN THE DECEMBER 2018 EDITION OF THE JOURNAL OF THE ENDOCRINE SOCIETY

Dexcom includes "double up" and "double down" arrows that the Libre does not.) Midyett says that the guidance-writing process drove home to him "the importance of developing a universal language of glucose management with more uniformity in nomenclature."

Tips on Exercise

Kudva says that one area in particular in which the Libre expert panel could add information that was absent from the Dexcom guidance "was about physical activity and exercise and how patients could use the CGM signal to manage their glucose." The guidance and the patient brochure both contain tables with recommendations. For example, in the case of a "pre-exercise glucose concentration" of 100–180 mg/dL, it gives the general advice to "exercise carefully; rescan every 30 minutes to avoid hypoglycemia." Specific advice relating to the trend arrow is: If the arrow is pointing straight up or 45 degrees up, "rescan in 30 minutes." If the arrow is stable or pointing 45 degrees downward, "consider ingesting 15g carbohydrate." If the arrow is pointing straight down, "consider ingesting 30g carbohydrate."

"Our recommendations are intended to provide a safe, practical approach to using the FreeStyle Libre systems, in general, and trend arrows, in particular," the guidance document concludes. "Our goal is to provide guidance that facilitates individualized recommendations for trend arrow use and data assessment. Our approach focuses on typical insulin sensitivity ranges used in adults and provides a range of adjustments in discrete insulin units. We believe this simplified approach reduces numeracy requirements and the number of calculations, which will help patients improve glucose control and increase glucose time in range without hypoglycemia, while promoting clinical discussion."

- SEABORG IS A FREELANCE WRITER BASED IN CHARLOTTESVILLE, VA. HE WROTE ABOUT THE ENDOCRINE SOCIETY'S NEW CLINICAL PRACTICE GUIDELINE ON TREATING ADULT SURVIVORS OF CHILDHOOD CANCERS IN THE DECEMBER 2018 ISSUE.



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SURVIVAL OF THE FITTEST:

Thyroid Cancer Survivors and Cardiovascular Disease Risks

A study published in *The Journal of Clinical Endocrinology & Metabolism* demonstrates a number of risks between thyroid cancer and cardiovascular disease. While the research shows typical co-morbidities in certain populations, could there be an actual link between the two?

BY KELLY HORVATH

www reations in cancer management and treatment, patients with cancer diagnoses are living longer. However, that very treatment may carry its own proprietary risks. "Cancer survivors are living longer today and need to be aware of long-term disease risks of certain diseases that can be a result of their cancer treatment and lifestyle factors," says Jihye Park, PhD candidate in the Department of Epidemiology at UNC Gillings School of Global Public Health in Chapel Hill, N.C. For thyroid cancer survivors, in particular, who tend to be young adults with very high five-year survival rates at 98.1%, does survival expose patients to additional disease risk? What is their quality of life, given their near-normal life expectancy?

Who's at Risk?

In "Risk Factors for Cardiovascular Disease Among Thyroid Cancer Survivors: Findings from the Utah Cancer Survivors Study," published in *The Journal of Clinical Endocrinology & Metabolism*, lead author Park and team set out to answer these very questions. With thyroid cancer incidence on the rise in the U.S., it is expected to become the fourth most common cancer here in just a dozen or so years, rapidly outranking its current status as the eighth most common cancer, with 64,300 new cases diagnosed in 2016. However, some states

have higher rates than others, possibly — but not definitively — due to environmental exposures. Utah has the third highest incidence rate of thyroid cancer at 19.03 per 100,000 population and was the location of the research team's study cohort. Using the Utah Cancer Registry coupled with demographic and clinical data from electronic medical records (EMRs) (e.g., sex, birth year, age at thyroid cancer diagnosis, race/ethnicity, body mass index [BMI], year of cancer diagnosis, cancer stage, cancer histologic type, number of cancers, cancer treatment) and Utah Department of Health vital records, the team was able to find primary thyroid cancer cases diagnosed from 1997 to 2012 and link them with treatment data as well as assign a Charlson comorbidity index (CCI) score to establish baseline health before the thyroid cancer was diagnosed.

The team reasoned that the thyroid cancer treatments that commonly accompany thyroidectomy might be correlated with long-term adverse health outcomes, with nearly half of patients with thyroid cancer receiving radioactive iodine (RAI) to prevent recurrence. Additionally, in some cases, thyroid-stimulating hormone (TSH) suppression may be done. Both adjunctive treatments have been suggested to increase risk of cardiovascular disease (CVD). So, the team set out to elucidate the connections among potential risk factors (both clinical and demographic), treatment effects, and CVD outcomes in thyroid cancer **66** In the United States, there are more than 800,000 thyroid cancer survivors today. With more thyroid cancer patients surviving for longer periods, it is important to know which thyroid cancer survivors are at higher risk of developing life-threatening conditions such as CVD."

- JIHYE PARK, PHD CANDIDATE, DEPARTMENT OF EPIDEMIOLOGY, UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH, CHAPEL HILL, N.C.

AT A GLANCE

- Patients with thyroid cancer who received adjunctive TSH suppression therapy had increased risk of developing CVD one to five years after diagnosis; those who received RAI had a somewhat greater risk of developing cerebrovascular disease in the same time frame.
- Among thyroid cancer survivors, most of those who did not have a CVD diagnosis had no baseline comorbidities, but those with a CVD diagnosis were more likely to be elderly, male, and overweight or obese. Those with any comorbidity had more than a fourfold increased risk of developing CVD compared with those with no comorbid conditions.

Patients with thyroid cancer with a diagnosis from 2005 to 2009 or 2010 to 2012 had an increased risk of CVD compared with the patients who were diagnosed from 1997 to 1999, possibly due to increased use of adjunctive TSH suppression and RAI in the most recent time period studied. survivors. "In the United States, there are more than 800,000 thyroid cancer survivors today," Park explains. "With more thyroid cancer patients surviving for longer periods, it is important to know which thyroid cancer survivors are at higher risk of developing life-threatening conditions such as CVD."

Saving Their Necks

The study cohort comprised 3,822 thyroid cancer survivors, most of whom (almost 92%) had a diagnosis of papillary carcinoma. They were predominantly white (96.1%) and female (78.8%). More than half of them underwent postoperative adjuvant RAI treatment in addition to surgery. Almost half of them (1,719; 45.0%) developed at least one cardiac or vascular disease one to five years after their cancer diagnosis.

"We studied potential risk factors, treatment effects, and CVD outcomes among nearly 4,000 thyroid cancer survivors over a 15-year period using the statewide Utah Population Database, and we identified who are at high risk of developing CVD after their primary thyroid cancer diagnosis," Park says. "We found that male thyroid cancer survivors have an almost 50% higher risk of developing CVD versus female, and obese thyroid cancer survivors have a 41% increased risk. TSH-suppression therapy was also associated with a 25% increased risk of CVD. Patients who received radiation therapy following surgery also had a higher risk of developing cerebrovascular disease compared to patients who received surgery only." The latter risk is possibly because of the proximity of the carotid arteries to the thyroid gland in the neck. Thus, the role and dosage of RAI after thyroid surgery, a treatment strategy that grew more common over the study period, needs to be fully examined to assess the risk of developing life- and quality-of-life-threatening circulatory system disorders.

"Our research findings provide important clinical implications for future interventions for better outcomes among thyroid cancer survivors," says Park. Their findings are supported by their large sample size as well as by the use of EMR data rather than patient self-report as previous studies have done. Related knowledge gaps that still need to be filled include specifics about types of TSH-suppression therapy and the RAI treatment, dose, and frequency used to clarify what treatment has what long-term effect. An evaluation of lifestyle choices like diet and level of physical activity also needs to be factored in to see what role, if any, these potential cofounders might play. Finally, a more diverse cohort should be studied to investigate potential race/ethnicity-related differences in outcomes.

In the meantime, according to Park and team, there are clear implications for both patients and clinicians. "We hope our results help them acknowledge potential risk factors for CVD," she says. "We hope cancer survivors who are at higher risk can be continuously monitored and screened for CVD for both earlier detection and preventative care."

- HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. SHE WROTE ABOUT PRENATAL THYROID SCREENING IN THE JANUARY ISSUE.

THE ENDOCRINE SOCIETY IS THRILLED TO ANNOUNCE AND CONGRATULATE THE 2019 LAUREATE AWARDS WINNERS

FRED CONRAD KOCH LIFETIME ACHIEVEMENT AWARD Edward M. Brown, MD

GERALD D. AURBACH AWARD FOR OUTSTANDING TRANSLATIONAL RESEARCH Helen H. Hobbs, MD

> INTERNATIONAL EXCELLENCE IN ENDOCRINOLOGY AWARD Ana Claudia Latronico, MD, PhD

> > OUTSTANDING CLINICAL INVESTIGATOR AWARD Wiebke Arlt, MD, DSc, FRCP, FMedSci

> > OUTSTANDING CLINICAL PRACTITIONER AWARD James W. Findling, MD

> > > OUTSTANDING EDUCATOR AWARD Kenneth D. Burman, MD

OUTSTANDING INNOVATION AWARD John J. Kopchick, PhD

OUTSTANDING LEADERSHIP IN ENDOCRINOLOGY AWARD William F. Young, Jr., MD, MSc

> **OUTSTANDING MENTOR AWARD** Dolores J. Lamb, PhD, HCLD (ABB)

OUTSTANDING SCHOLARLY PHYSICIAN AWARD lan D. Hay, MD, PhD

RICHARD E. WEITZMAN OUTSTANDING EARLY CAREER INVESTIGATOR AWARD Patrick Seale, PhD

> ROY O. GREEP AWARD FOR OUTSTANDING RESEARCH Cheryl Lyn Walker, PhD

SIDNEY H. INGBAR AWARD FOR DISTINGUISHED SERVICE

Carole R. Mendelson, PhD

Awards will be presented at ENDO 2019: The 101st Annual Meeting & Expo in New Orleans, LA, March 23-26, 2019.

Hormone Science to Health

QRA: the Endocrine Society's 2018 Outstanding Mentor Laureate Award, explains why it's never too early to have a mentor and why — into his 80s — he still values his own mentor! A Legaccy of Mentorship

Joel F. Habener, MD, who received

BY GLENDA FAUNTLEROY SHAW

hen the Endocrine Society honored Joel Habener, MA, MD, with the 2018 Laureate "Outstanding Mentor" Award, many heads were certainly nodding in laboratories across the country. Habener is the chief of the Laboratory of Molecular Endocrinology at Massachusetts General Hospital and professor of medicine at the Harvard Medical School in Boston. He's recognized for creating an outstanding laboratory environment, enabling discovery and characterization of peptide hormone genes, transcription factors, and mechanisms regulating β -cell function and survival.

Over several decades, the 81-year-old trailblazer has trained dozens of scientists who, in turn, have mentored hundreds of trainees and fellows. Habener's legacy of mentorship has produced leaders in the fields of clinical medicine, academic administration, industry, and basic science — especially encouraging them all to participate in the Society. *Endocrine News* caught up with him to talk about the legacy of young scientists who are fortunate to call him "mentor."

Endocrine News: What comes to mind when you're reminded of all those past young scientists you've help guide through the years?

Habener: It's been a gift. I'm certainly fortunate to have been in the middle of this academic center we have in the Harvard area — our medical school and the different universities — all pretty compact in Boston and at Mass General Hospital, with its size and being one of the top five best hospitals in the country. I've

been able to interact with many postdocs or fellows who were in their middle to late stages of training. A number of the fellows went through their clinical training program here in endocrinology, so they had a really tremendous background as many of them held MD and PhDs.

But I've just had so much fun, and I think the one main point about mentoring is that it's bi-directional, not uni-directional. I learn as much from them as the other way around because they're doing the background research on my projects and the clinical investigations. They help guide the studies, so I'm learning, too.

EN: What advice do you give young scientists about the timing of finding a mentor? Is it ever too soon?

Habener: No, I think it should start very early in their career and last a very long time. I'm in the latter category. I'm in my 80s, and I still have a mentor. My mentor is Dr. John Potts who was chief of the Department of Medicine here at the Massachusetts General Hospital. He actually recruited me back in 1968. I came to the hospital to finish my medical residency as an endocrine fellow in the endocrine training program here, and he was my mentor. And still is. I think people should start looking for mentors early, even if it's in college before you get a baccalaureate degree. So, if you do research, you're doing it with somebody who has a grant, who's funded, and is a researcher, so that person becomes a sort of a mentor at the early stages.

EN: With Dr. Potts still being your mentor since the 1960s, your relationship surely is more than just the work. Do you find that most mentor-mentee relationships become a friendship?

Habener: It certainly does, as time goes on. I have more and more postdocs who are out there and are now independent. They have their own academic careers, and a lot of them are in academic institutions in the United States and other countries like Germany and France. They come and visit me, and it's wonderful to see them again, to see how they're doing and to see that their careers are booming and moving forward. Some of my past postdocs have become deans and department heads. **EN:** It looks like you're not slowing down. You're still going to conferences and still working on your research, so there's surely still people who will enjoy your mentorship.

Habener: I'm still coming into work mostly five days a week, and I have a small group now in my lab, about four or five people, and we're pretty much focused on the work. One

6 6 I think the one main point about mentoring is that it's bi-directional, not uni-directional.
I learn as much from them as the other way around because they're doing the background research on my projects and the clinical investigations. They help guide the studies, so I'm learning, too."

of them, Violeta Stanojevic, has been with me for about 23 years and we're doing experiments and getting nice results. It's exciting. I really enjoy it. Any time you have people who enjoy what they're doing, whether it's playing tennis, going fishing, or playing cards, anything that keeps your mind moving and thinking, it's good.

--FAUNTLEROY SHAW IS A FREELANCE WRITER BASED IN CARMEL, IN. SHE IS A REGULAR CONTRIBUTOR TO *ENDOCRINE NEWS*.

Endocrine Society Opposes "Plan S" Initiative; Advocates for Researchers, Scholarly Publications The Endocrine Society is working with the broader research community to oppose a European initiative, known as Plan S, that would require researchers who receive funding from any of the plan's supporting organizations to publish exclusively in open-access journals beginning January 1, 2020.

Initially conceived by a coalition (Coalition-S) with the backing of the European Commission and European Research Council, the initiative seeks to build international and organizational support. The list of supporters includes some national funding organizations such as the Wellcome Trust, the Research Council of Norway, the French Agence Nationale de la Recherche, and also foundations and institutions such as the Bill & Melinda Gates Foundation (currently the sole U.S. supporter) and the European Molecular Biology Organization.

Although Plan S funders currently account for only a small percentage of global research funding, as attention to Plan S has grown, professional societies, research organizations, and journal publishers, including the Endocrine Society, are examining how a transition to Plan S-compliant

> publishing would impact their work and affect their members and scholarly enterprise worldwide.

> The consequences of broad adoption of the requirements of Plan S as presently envisaged could be extremely disruptive. Subscription and "hybrid" journals (a subscription journal that allows individual articles to be published open access), including those published by the Endocrine Society, would in general not be compliant, unless the journals had agreed to become fully "Gold" open access in the near future. This means that researchers funded by Coalition S members would not be able to publish in the vast majority of top-quality journals. Additionally, authors and publishers would be required to cede control over published works under the Creative Commons licenses (CC-BY) required by Plan S, with no control over republication, commercial use, and derivative works by third parties.

Plan S requires that articles appear in compliant journals even if only one coauthor received Plan S funder support and some details of Plan S remain vague or unexplained in terms of operational application. It remains uncertain how journals and authors will be able to adapt to a business model reliant on the "capped" article processing charges (APCs) that Plan S funders have undertaken to announce.

Drug Pricing Takes Center Stage in Congress

Ithough there is gridlock over many important legislative issues, one issue that is getting increasing agreement and prioritization in Congress and the administration is the rising costs of prescription drugs. One of the first acts of several members in the House of Representatives was to introduce legislation:

- Representative Peter Welch (D-VT) introduced a bill (HR 275) that would require the administration to negotiate directly with drug makers to set better prices for the Medicare Part D plans administered by private insurers. So far, the bill has one Republican co-sponsor, Representative Francis Rooney (R-FL).
- Senator Chuck Grassley (R-IA), who is the new chairman
 of the Senate Finance Committee, said he wants to pursue
 legislation to lower drug prices but opposes allowing
 the government to negotiate Medicare drug prices. His
 priorities are to work on legislation that would ban "pay
 for delay" settlements between brand name and generic
 drug companies; give generics easier access to the product
 samples they need to develop their products; and to let
 Americans import cheaper drugs from Canada.
- Senator Bernie Sanders (I-VT) also plans to introduce three new bills aimed at lowering the price of prescription drugs.

 Representative Bobby Rush (D-IL) introduced legislation (HR 366) — the Insulin Access for All Act of 2019 — to eliminate the cost-sharing requirement under Medicare and Medicaid for insulin. The bill is co-sponsored by 33 Democrats.

The Endocrine Society released a position statement (**www. endocrine.org/insulin**) last November providing several recommendations for policy makers. We continue to work with the Congressional Diabetes Caucus on potential solutions to reduce the price of insulin, and we plan to meet with the newly appointed senior advisor for drug pricing reform in the administration to share our policy recommendations.

Take Action

The new U.S. 116th Congress was sworn in on January 3, 2019. A new Congress presents an extraordinary opportunity for you to contact the new members of the Senate and the House of Representatives, offer your expertise as endocrinologists and/or researchers, and share what issues you and the Endocrine Society find important.

Join our campaign at *www.endocrine.org/takeaction* to welcome your new member of Congress today!

LOVE YOUR HEART: LOWERING THE RISK FOR HEART DISEASE

Cardiovascular or "Heart" disease is a range of conditions that can affect your heart. Hormones play a necessary role in maintaining healthy cardiovascular function. Heart disease symptoms can be different for both men and women and is easier treat when detected early. Talk to your healthcare provider about ways to keep your heart healthy.

UNDERSTANDING

CARDIOMETABOLIC RISK is a person's chances of damaging their heart and blood vessels when one or more is risk factor is present. Obesity, high levels of cholesterol, high blood pressure, and insulin resistance can put you at risk.

DYSLIPIDEMIA is having an abnormal level of cholesterol and fats (lipids) in the blood. Fats are important, but too much of it can increase the chance of having a heart attack or heart disease. Women with PCOS are at a higher risk for dyslipidemia.

HYPERLIPIDEMIA means that there are high levels of fats in the blood. These fats include cholesterol and triglycerides, which are needed for our bodies to function. But if they are too high, these fats can increase the risk for heart disease and stroke.

HYPERTENSION (HIGH BLOOD PRESSURE) is the leading cause of heart disease. Hypertension greatly raises your risk of having a heart attack, stroke, or kidney failure. Many people with hypertension may not have any symptoms and is often known as "the silent killer."

TRIGLYCERIDES, a type of fat in the blood, are an important source of energy. After you eat the body converts the calories that you don't need into triglycerides and stores them in the fat cells to be used for energy later. When triglyceride levels are too high (a condition known as hypertriglyceridemia), it can increase the risk for pancreatitis, heart disease, and other serious health problems.

PREVENTION

CARDIOMETABOLIC RISK can be prevented. Exercise is a cornerstone in prevention and improving your risk factors. Aerobic exercises like walking, swimming, running and even dancing can reduce inflammation related to chronic diseases.

LIFESTYLE changes can prevent dyslipidemia! Establishing a well-balance diet low in saturated fats and cholesterol and including fruits, vegetables, fish, and healthy fats found in foods like avocados can prevent lipid abnormalities . Talk to your health care provider to find the perfect diet for you!

Exercise, improving your diet, and weight loss can prevent the onset of hyperlipidemia. But **MEDICATION** can also help. The type and dose will depend on your blood fat levels, if you have heart disease, diabetes, or other risk factors for heart disease. Speak to your healthcare provider to learn more.

HEALTHY HABITS such as reducing your sodium intake, consuming less alcohol, eating potassium rich foods and exercise can reduce blood pressure. Lowering your stress levels can also keep blood pressure normal. Try mindbody activities such as yoga to lower your blood pressure and possible delay the need for drug interventions.

According to the CDC about 25% of adults have elevated levels of triglycerides. You can naturally reduce these levels by eating foods low in saturated fats, limiting your sugar intake, and following a low-carb diet. Diet and lifestyle factors have a major influence on your heart and a few small changes can improve your **OVERALL HEALTH**.

Hormone Health

FROM THE ENDOCRINE SOCIETY

0

Patients have questions. We have answers.

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Location

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Staff position in Endocrine Section with involvement in comprehensive clinical program. Clinical activities (80 percent) occur at an ancillary MedStar local facility. Education and research (20 percent) occur at the MedStar Washington Hospital Center (MWHC) in Washington DC. Interested candidates must be board certified (or eligible) in endocrinology.

Qualifications

- MD, DO, or International Equivalent
- · Board certified / eligible in Endocrinology

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PennState Health Milton S. Hershey Medical Center

ENDOCRINOLOGY CLINICAL INVESTIGATOR/SCIENTIST

The Division of Endocrinology, Diabetes, and Metabolism at Penn State Health Milton S. Hershey Medical Center, Penn State College of Medicine (Hershey, PA) is seeking an NIHfunded Clinical Investigator/Scientist with a focus on basic/ clinical diabetes related research to join an expanding Diabetes program. A highly competitive departmental and institutional start-up package will supplement the candidate's extramural support to strengthen and expand the candidate's ongoing research with the goal of developing novel scholarly initiatives within the division and the institution in the field of diabetes. Joint appointments in Basic Science Departments are anticipated.

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Qualified applicants should contact:

Andrea Manni, M.D. Professor and Division Chief of Endocrinology Diabetes, and Metabolism c/o Heather Peffley, PHR, FASPR Physician Recruiter Penn State Health hpeffley@pennstatehealth.psu.edu

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 EPIC fully integrated HIMSS Stage VII
 (Only 5% of hospitals in country are at this level of sophistication)
 - Easy to use; support department available

Benefit Packages

- Highly competitive salary offers (Negotiable MGMA guidelines)
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System Details

- Well established not-for-profit 3 hospital system
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- Some of the most favorable malpractice laws and regulations in the country

For additional information, please contact Alan Kumar, MD and Jennifer Malinowski via email at: alan.kumar@comhs.org and <u>ilmalinowski@comhs.org</u>

ENDOCRINOLOGY PHYSICIAN

The Division of Endocrinology, Diabetes, and Metabolism at Penn State Health seeks to fill a junior faculty clinical position. This is a fixed- term position for a **BC/BE Endocrinologist** at the **Assistant Professor** rank. While the primary focus of this position is in patient care, candidates are also expected to participate in teaching and scholarly activities. Candidates will join an academic department, dedicated to education, innovation, leadership and work among highly qualified, friendly colleagues who foster excellent networking opportunities.

Located in a safe family-friendly setting of central Pennsylvania, our local neighborhoods boast a reasonable cost of living whether you prefer a more suburban setting or thriving city rich in theater, arts, and culture. Known for home of the Hershey chocolate bar, Hershey's community is rich in history and offers an abundant range of outdoor activities, arts, and diverse experiences. We're conveniently located within a short distance to major cities such as Philadelphia, Pittsburgh, NYC, Baltimore, and Washington DC. We're proud of our community involvement and encourage you to learn more about our organization.

Appropriate candidates must possess a MD, DO, or foreign equivalent and be board certified/eligible in Internal Medicine and Endocrinology. Candidates should be energetic and highly motivated.

Qualified applicants should upload a letter of interest and CV at: <u>http://tinyurl.com/pj45tup</u> Ref Job ID#954

> For additional information, please contact: Andrea Manni, M.D. Professor and Division Chief of Endocrinology Diabetes, and Metabolism c/o Heather Peffley, PHR FASPR Physician Recruiter hpeffley@pennstatehealth.psu.edu

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