

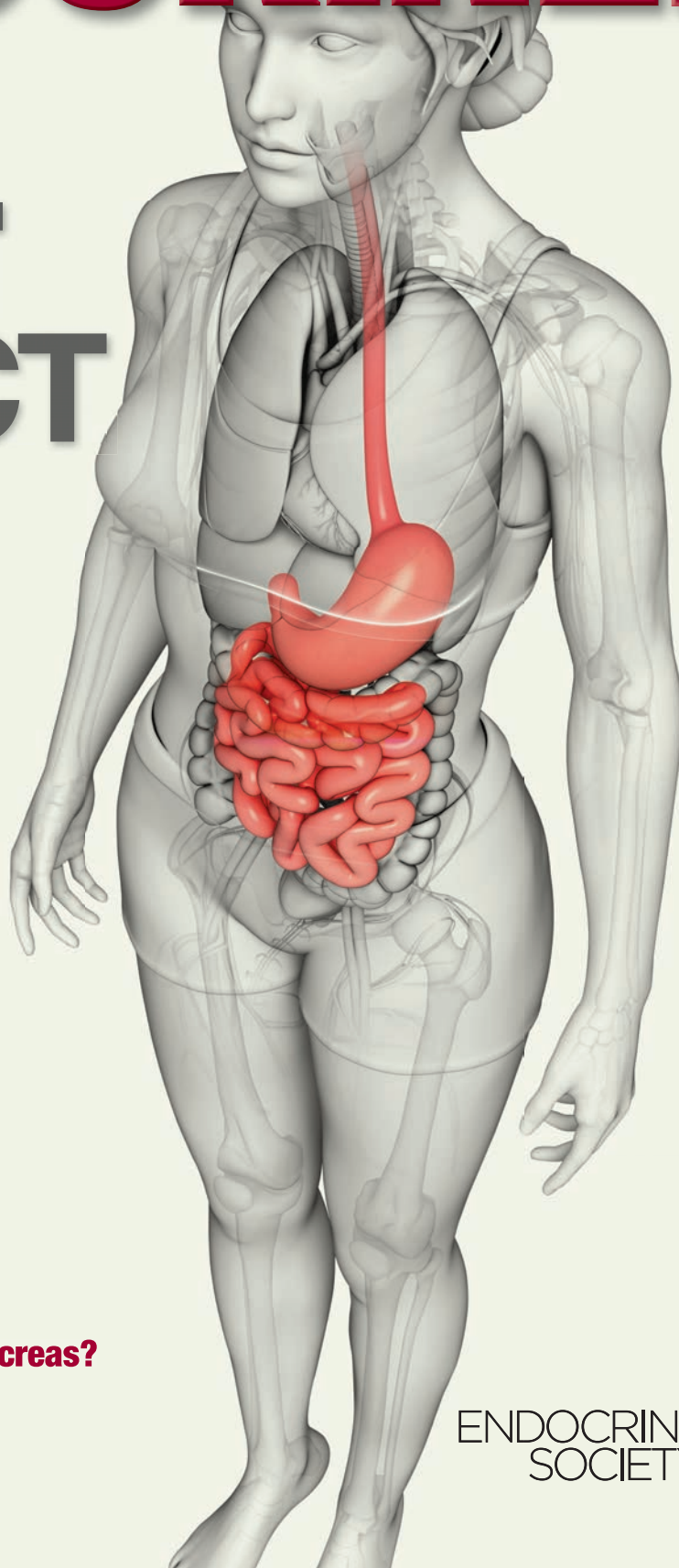
MAY 2015

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

ENDOCRINETM NEWS

GUT INSTINCT

Aside from the expected effects the gut microbiome has on metabolism, researchers are finding more and more consequences from the ecosystem inside every GI tract. From hypertension to depression, the gut microbiome influences the entire human body.



**NO CHILD LEFT BEHIND:
Where is the Pediatric Artificial Pancreas?**

**ENDO 2015 WRAP-UP:
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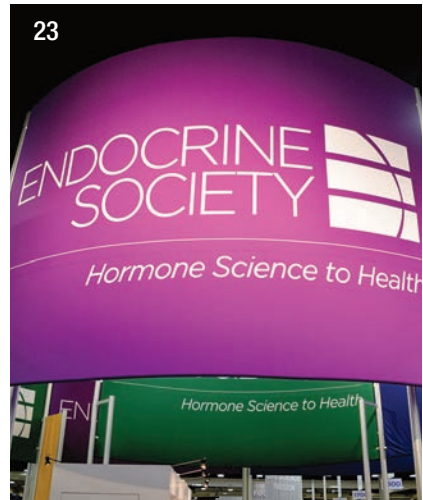
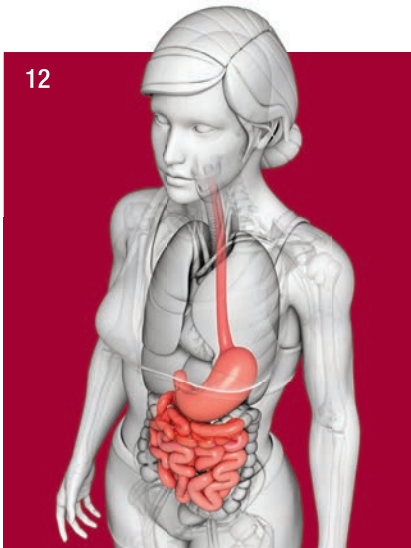
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ENDOCRINE BOARD REVIEW
SEPTEMBER 8-9, 2015

CLINICAL ENDOCRINOLOGY UPDATE
SEPTEMBER 10-12, 2015

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Moving Forward While **Honoring the Society's Past**



Lisa H. Fish, MD

As my presidential term begins, I would like to build upon some of the important initiatives and activities that have been started by those before me. Having said that, there are many new areas that will require our attention and focus as we move forward, and it will take a strategic and collective effort to accomplish all of our goals.

In the past few years, the Society has become more involved in certain areas such as health disparities, diabetes, obesity,

international outreach, and most recently, the next generation of endocrinologists.

These are all very important areas, and I would like to keep the momentum moving forward.

Some of the strategic activities that I will be championing this year are an extension of these previous initiatives.

Endo Cares

A key strategy moving forward will be to launch a social responsibility campaign in the coming year. The program, **Endo Cares**, will continue our strategic initiatives in health disparities and global outreach (such as the Ambassador Exchange Program). With our centennial year approaching, we felt that it was time for the Society to develop a program that gives back to the community through our expertise and resources. In the program's pilot, the Society will focus on giving back to the diabetes community through partnerships with AYUDA and other charities serving diabetes camps in the U.S. and around the world. Our members will have opportunities to staff these camps, interact directly with patients, and educate/advise local healthcare providers in diabetes care and management. For this program to be successful, we will need the support and participation of all of our members.

This will be the Society's first real opportunity to rally around the concept of giving back to the global endocrine community, and with your help we hope to enlist the participation of every member around the world. I am very committed to this important initiative and am looking forward to working with you to make this a successful initiative for the Society.

Centennial Celebration

The Endocrine Society is approaching the 100-year mark and the Society and its members plan to embark on a year-long celebration of endocrinology spanning the

2016 calendar year. I am very excited and honored to lead the Society through its 100th anniversary celebration. A Centennial Task Force has been working with staff to develop a concept that not only celebrates the past 100 years of the Endocrine Society and endocrinology but also looks to the future. We want to affirm the value of the Society and its unified membership base, celebrating its history and the history of the field. At the same time, we plan to position the celebration not just as a retrospective but as an opportunity to look forward toward what the future holds for the field, in scientific and medical advancements. This is our opportunity to showcase how therapies have evolved and were created, and more importantly, show the impact they have

had on patients. The celebration will be global, drawing in our sister and partner organizations from around the world to embrace the worldwide endocrine, medical, and scientific community.

In future letters, I will provide more details on some of the other strategic areas that will be pursued this coming year. Two separate task forces are being appointed to work on Knowledge Integration and Leadership Development, respectively. The Knowledge Integration group will focus on improving how we provide valuable content to our members, the medical community, and the public in an integrated, learner-centric platform to ensure that the end-users have an efficient and satisfying learning experience. The Leadership Development

task force will focus on creating an integrated and sustained plan for leadership development within the Society, not just at an early stage but throughout the members' career lifecycle and identifying greater and more flexible opportunities for member engagement and involvement with the Society worldwide.

This will be an exciting year, and I look forward to working with our dedicated members and staff to advance these initiatives in the coming months. If you have any comments or questions, please contact me at president@endocrine.org. **EN**

The Endocrine Society is approaching 100 years old, and the Society and its members plan to embark on a year-long celebration of endocrinology spanning the 2016 calendar year.

I am very excited and honored to lead the Society through its 100th anniversary celebration.

The celebration will be global, drawing in our sister and partner organizations from around the world.

Lisa H. Fish, MD, FACP
President, Endocrine Society

MAY 2015

ENDOCRINE news

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

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Endocrine News informs and engages the global endocrine community by delivering timely, accurate, and trusted content covering the practice, research, and profession of endocrinology.

The mission of the *Endocrine Society* is to advance excellence in endocrinology and promote its essential and integrative role in scientific discovery, medical practice, and human health.

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On page 12, Eric Seaborg takes us on something of a “fantastic voyage” as he explores our innards for his in-depth piece on the gut microbiome that might surprise a lot of you. In “Gut Instinct,” we actually learn that this microbiota is not a foreign body — as many people believe — but actually a part of the human body. “You have to be adapted to live in the gut, and that adaptation process has occurred over millions of years,” says Lee Kaplan, MD, PhD, director of the Obesity, Metabolism, and Nutrition Institute at Massachusetts General Hospital in Boston. “You can think of the microbiota as an organ, and one of its functions appears to be to help regulate metabolic functions in the other organs.”

For those of you who spend your days treating children, you have no doubt seen the rewards as well as the challenges of treating this precious — and often precocious — population. However, the lack of predictability in these patients is just one of the contributing factors that has made creating an artificial pancreas a challenge that has lasted over the past two decades. In “No Child Left Behind?” (p. 16), Melissa Mapes talks to the researchers who have spent their careers attempting to create such a device to serve this delicate group of patients.

The Endocrine Society’s Endocrine Press has released its second book, *Molecular Nutrition: A Practical Guide*, edited by Jeffrey I. Mechanick, MD; Michael A. Via, MD; and Shan Zao, PhD. *Endocrine News* conducted a Q&A with Mechanick about why this was such an important book for the Society to publish and what may surprise you about food and its molecular structure (p. 19). He told me that *Molecular Nutrition* is not a standard textbook, but rather a story, and it’s the reader’s epilogue he’s more interested in.

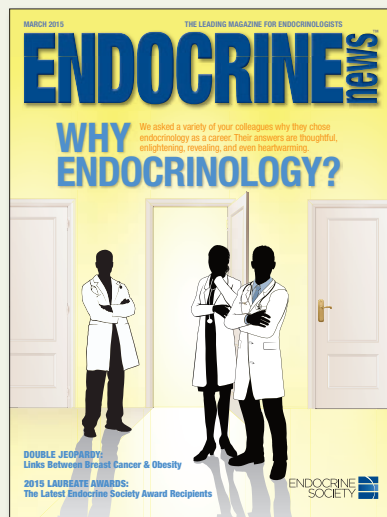
Associate editor Derek Bagley has assembled some of the highlights of ENDO 2015 in his wrap-up of the meeting in “On the Waterfront” on page 23. He touched on everything from a thyroid cancer-sniffing German Shepherd to a fitting tribute to the late Chip Ridgway, as well as a highlight of some of the hundreds of poster sessions. While it is by no means as comprehensive as ENDO itself, it should help to inspire you to prepare for Boston next April!

Finally, we’ve included a rather exhaustive “Letters to the Editor” section this month, something we rarely feature in *Endocrine News*, mainly because we get so few of them (p. 6). In this case, however, they are all about a single story: the “Why Endocrinology?” feature in March. I was surprised and heartened that such honest tales from your fellow endocrinologists struck such a chord with so many of you. Look for more stories of this nature going forward in the pages of *Endocrine News*. And if you have an idea for a story, please let me know at mnewman@endocrine.org. **EN**

Mark A. Newman,
Editor, *Endocrine News*



Mark A. Newman



Dear Mark –

I wanted to take a quick two minutes to thank you for the effort you put in to *Endocrine News* and to express my feelings about the excellent content you routinely include. I always read it the day I receive it. I must also point out, however, that when I happily saw the article about “Why Endocrinology?” with the idea that I would give it out to all my younger trainees, imagine my dismay when there was not one pediatric endocrinologist interviewed.

Pediatric endocrinologists see almost every pathology an adult endocrinologist sees — and then more — since we are the physicians diagnosing all the congenital endocrinopathies, syndromes with endocrine components, and maternal endocrinopathies that affect the fetus. We feel we make a real difference on so many levels, and validation is an important part of work satisfaction.

Yes, we have the satisfaction of replacement therapy and of treating hormone excess, but from a clinical perspective it goes beyond that. We have a privileged role as genetic counselors — we are heavy users of molecular diagnosis, and must

pursue genetic diagnoses when appropriate not only for the patient, but also for future siblings with the same congenital endocrinopathies — DSD, CAH, and PHP1a to name a few. Our practice is incredibly varied — and (at least for now) we are not overly solicited by the enormous demands of the type 2 diabetic community, which means that we routinely see at least 15 to 20 different ICD endocrine diagnoses in an average clinic day. At the same time our role in the prevention of obesity and its complications is paramount and as every parent knows, what you may not want to do for yourself you can often find the motivation to do for your child.

We play a critical role in transitioning our patients to adult care, and help to ensure that our adult colleagues who receive them are at ease with diagnoses that 30 years ago would not have had the same life expectancy or the same therapeutic approaches as today (childhood cancer survivors, T1D, and PWS come to mind here). Finally (at least in Canada), our practice is about 90% based in academic centers, which means that we have a mandate (and hopefully a bit more protected time) to do not only patient care, but also research and teaching. What could be better to keep our enthusiasm for the specialty and our quest for learning alive?

I wouldn't have bothered writing this if it weren't for the fact that when I was on the Steering Committee (2011 to 2014), the need to bring the Ped Endos to the Endocrine Society and to the annual ENDO meetings was frequently discussed. I personally think it is imperative, since we can all (Ped Endo, Adult Endo, PhD researcher) profit from these interactions from a patient care, research, and teaching perspective. Perhaps you might think of a future article comparing and contrasting pediatric and adult endocrinology practices,

which will enable the Society to highlight what your Ped Endo members do and help generate interest for the pediatric content of the meeting.

Keep up the good work, and thanks again.

Cheri Deal, PhD, MD, FRCPC, chief, Endocrine and Diabetes Service, CHU-Ste-Justine

Prof. of Pediatrics, Université de Montréal, Montréal, Canada

EDITOR'S RESPONSE:

Dear Dr. Deal,

Thanks so much for your great email.

And I totally agree with your comments. In planning the article “Why Endocrinology?” my aim was to get as big a cross-section of the Endocrine Society membership as possible from all three constituencies from around the world, as well as from endocrinology veterans and early career endocrinologists. Inevitably some groups were going to be left out and I apologize for not including a pediatric endocrinologist.

Endocrine News is well aware of the importance of pediatric endocrinology as we routinely feature articles on endocrine disorders and how they affect babies, children, young adults, and even pregnant mothers. In fact, in the past year alone we've had features on how EDCs affect children (April 2014); delayed puberty (October 2014); and obesity in teens and children (July 2014). Furthermore, we are planning more articles concerning endocrine disorders in children in 2015: Pediatric perspectives in insulin pumps and the artificial pancreas (p.16); pediatric thyroid cancer (June); EDCs during pregnancy (October); and there will likely be more.

Thanks again for your thoughtful email.

Regards,

Mark A. Newman

Dear Mr. Newman and Dr. Santen,

After reading the March edition of *Endocrine News*, I was struck by the wonderful article “Why Endocrinology?” in juxtaposition with the “Fast FACTS about Endocrinologists.” After reading about the rewards and intellectual stimulation of being an endocrinologist, I was very disheartened by the 45% of endocrinologists who report feeling “burned out.” The statistic of “47% of endocrinologists 35 and younger feeling burned out” is even more shocking and distressing for our future.

I am writing to ask what the Endocrine Society is doing to address such a high percentage of burnout. This is clearly one of the largest challenges for our future.

After being in private practice in metropolitan Chicago for 20 years and now working as a clinician educator at a large community hospital, I have witnessed firsthand the effects of such burnout.

Thank you for listening.

Sally M. Pinkstaff, MD, PhD, FACE, FACP, Sinai Hospital of Baltimore, assistant professor, Johns Hopkins University School of Medicine, Baltimore, Md.

EDITOR'S RESPONSE:

Dear Dr. Pinkstaff:

First off, thank you for your comments regarding the article, “Why Endocrinology?” in the March issue. It was interesting to hear from so many different types of endocrinology professionals from around the world about why they chose endocrinology. It was also an effort to focus a bit more on the members and bring their lives and accomplishments to the forefront in that particular issue.

I know Dr. Santen has already sent along his white paper on the next generation of endocrinologists, but I wanted to let you know that Endocrine News has addressed the issue of career burnout recently; in the August 2013 issue, we published a story addressing

this issue as well as the underlying causes and possible solutions.

Again, thank you for your kind comments and your concerns regarding this phenomenon.

Regards,

Mark A. Newman

RICHARD J. SANTEN'S RESPONSE:

When president of the Endocrine Society... I was concerned about the next generation of endocrinologists. Please read the “white paper” that I have written about this group but not specifically about burnout. We formed a task force to address all issues of the next gen. I will call this to the attention of the Trainee and Career Development Core Committee to discuss the problem

Thank you for the alert,

Dr. Santen

[Editor's Note: Upon reading the white paper that Dr. Santen authored — “Empowerment of the Next Generation of Endocrinologists” — Dr. Pinkstaff sent the following response.]

Dear Mr. Newman,

After reading the white paper by Dr. Santen and the article in *Endocrine News*, I hope that the Endocrine Society can develop and implement a strategy to significantly reduce burnout. In my opinion, there needs to be radical change with consideration for collective representation and demand for increased valuation, not only financial but also in personnel support. The corporate control of healthcare is demoralizing and mowing us down with an attitude that we are all “replaceable tomorrow.”

Again thanks for listening.

Sincerely,

Sally Pinkstaff, MD, PhD FACP, FACE

Dear Mr. Newman:

I read with interest your article in the new issue of *Endocrine News* (“Why Endocrinology?” March 2015).

You note the article last summer as well, predicting a shortage of endocrinologists in the near future.

You note that in 2011, 70% of endocrinologists would still choose to go into the profession of medicine, while one year later only 57% would. Also in 2011, 70% would still choose endocrinology, while in 2012 only 38% would make the same choice.

The article goes on to a series of comments by a cross-section of endocrinologists on why they entered or are entering the field, including clinicians, clinical investigators, and basic investigators, both MDs and PhDs.

In view of the obvious decline in interest in the field, it would have been very interesting, and in my opinion strengthened the article to get comments from individuals who would not choose the field.

I am a retired endocrinologist who probably would not choose medicine again, but if I did, I would definitely choose endocrinology.

Again, thanks for the interesting article.

Thad C. Hagen, MD, professor emeritus of medicine, The Medical College of Wisconsin, Milwaukee

EDITOR'S RESPONSE:

Dr. Hagen,

I agree with you about asking physicians why they DIDN'T choose endocrinology. After I received your email I started thinking about perhaps doing a follow-up article, “Why I Didn't Choose Endocrinology.”

However, since the goal of the Endocrine Society is to promote the practice and study of endocrinology, I would personally feel uncomfortable about an article that would potentially shine a negative light on this complicated and intriguing practice of medicine.

But you have certainly given me something to think about.

Regards,

Mark A. Newman

By Derek Bagley

UNITED STATES Most Expensive Place to Have T2D

People with type 2 diabetes in the U.S. have the highest health-care costs to treat the disease in the world, according to a recent study published in *PharmacoEconomics*. The lifetime price tag to treat T2D in the U.S. is around \$283,000, even higher than in other countries with comparable income levels.

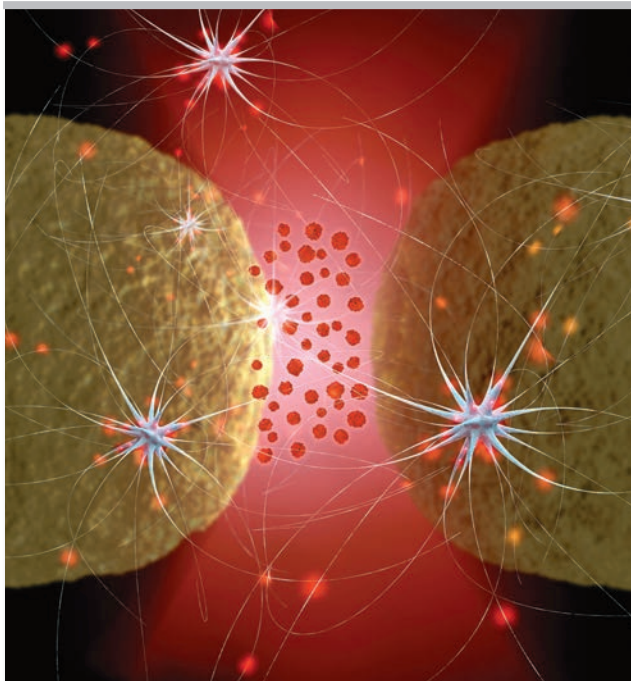
Researchers led by Till Seuring, of the University of East Anglia's Norwich Medical School in the United Kingdom, provided a systematic review of the global evidence on the cost of T2D. They identified data from 109 studies — 86 cost-of-illness (COI) and 23 labor market — in the largest global review of the economic impact of diabetes.

The team found that direct costs were generally higher than indirect costs. They wrote, "Direct costs ranged from \$242 for a study on out-of-pocket expenditures in Mexico to \$11,917 for a study on the cost of diabetes in the USA, while indirect costs ranged from \$45 for Pakistan to \$16,914 for the Bahamas." Seuring and his team went on to write that direct diabetes costs appear to be closely and positively associated with a country's gross domestic product (GDP), "and that the USA stood out as having particularly high costs, even after controlling for GDP per capita."

Diabetes hits poor countries the hardest since they have to bear higher costs burdens, and that's compounded by the fact that two-thirds of all cases of diabetes are now in low- and middle-income countries such as China, India, Mexico, and Egypt.



Seuring said in a statement: "Our findings underline the fact that diabetes not only has strong adverse effects on people's health but also presents a large — and at least partly avoidable — economic burden. We also found that the economic burden of diabetes increases over time. So early investments into prevention and disease management may therefore be particularly worthwhile. For both rich and poor countries, the results mean that better prevention and management of diabetes has the potential to not only bring good health but also economic gains. We would hope that the findings further increase the policy attention being paid to diabetes prevention and management in rich countries and it should in particular make health and economic policymakers in developing countries aware of the economic damage that diabetes can do."



KISSPEPTIN Expressed in Mouse Leydig Cells

Kisspeptin is expressed in mouse Leydig cells, meaning it may play an important role in male reproduction, according to a study recently published in *Endocrinology*.

Researchers led by Sajad Salehi, MD, of Johns Hopkins School of Medicine, noted that kisspeptin has been reported to be expressed in peripheral tissues, including the testes, but "factors regulating testicular kisspeptin and its role in reproduction are unknown." So Salehi and his team set out to address kisspeptin's function in the testis and to determine the level of kisspeptin in the testis in comparison with the brain and other tissues, "how these levels change from the prepubertal period through sexual maturation, and the factors involved in kisspeptin regulation in the testis."

The investigators used immunohistochemical analysis of testis sections in mice with a validated kisspeptin

antibody localized kisspeptin to the Leydig cells. They did not find kisspeptin in germ cells or Sertoli cells within the seminiferous tubules at any developmental time period studied, from prepuberty to sexual maturation. However, they did find that kisspeptin was expressed in the mice's Leydig cells, and that *in vitro* and *in vivo* studies indicated clearly that luteinizing hormone (LH) is involved in regulating levels of Leydig cell kisspeptin. "Interestingly," the authors wrote, "gonadectomy resulted in elevated LH but reduced serum kisspeptin levels, suggesting that testicular kisspeptin may be secreted. These data docu-

ment kisspeptin expression in mouse Leydig cells, its secretion into peripheral serum, and its regulation by changes in reproductive neuroendocrine function." The researchers pointed out that these data raise questions about where within the testes kisspeptin is present, when during testicular development it appears, how it is regulated, and what it does. They concluded that "kisspeptin is present in Leydig cells, developmentally responsive, and regulated by neuroendocrine mechanisms controlling LH. We propose that Leydig cell kisspeptin may play a pivotal role in peripheral and neuroendocrine modulation of male reproduction."

Night Owls Face **GREATER RISK OF DEVELOPING DIABETES** than Early Risers

Korean researchers have found that "night owls" are more likely to develop diabetes, metabolic syndrome, and sarcopenia than early risers, even when they get the same amount of sleep, according to a new study published in *The Journal of Clinical Endocrinology & Metabolism*.

The study, led by Nan Hee Kim, MD, PhD, of Korea University College of Medicine in Ansan, Korea, examined sleeping habits and metabolism in 1,620 participants in the population-based cohort Korean Genome Epidemiology Study (KoGES). The study subjects were between the ages of 47 and 59. Participants responded to questionnaires about their sleep-wake cycle, sleep quality, and lifestyle habits. Researchers took blood samples to assess participants' metabolic health, and the study subjects underwent DEXA scans to measure total body fat and lean mass, and CT scans to measure abdominal visceral fat. Based on the

questionnaire results, 480 participants were classified as morning chronotypes, and 95 were categorized as evening chronotypes. The remaining participants had a sleep-wake cycle between the two extremes.

Even though the evening chronotypes tended to be younger, they had higher levels of body fat and triglycerides than morning chronotypes. Night owls also were more likely to have sarcopenia. Men who were evening chronotypes were more likely to have diabetes or sarcopenia than early risers. Among women, night owls tended to have more belly fat and a great risk of metabolic syndrome.

"Regardless of lifestyle, people who stayed up late faced a higher risk of developing health problems like diabetes or reduced muscle mass than those who were early risers," Kim says. "This could be caused by night owls' tendency to have poorer sleep quality and to engage in unhealthy behaviors like smoking, late-night eating, and a sedentary lifestyle."



DOPAMINE Shows Anti-cretin, Anti-proliferative Action on β -Cells

Dopamine (DA) may regulate insulin secretion from β -cells and play an important role in homeostasis of β -cell mass, which could explain bariatric surgery's effects on type 2 diabetes, according to a study recently published in *Molecular Endocrinology*.

Researchers led by Antonella Maffei, PhD, of Columbia University, noted that human islet β -cells exploit an autocrine DA-mediated inhibitory circuit to regulate endocrine secretion. They also pointed out that in humans, a mixed meal stimulus is accompanied by contemporary serum excursions of incretins, DA, and its biosynthetic precursor L-3,4-dihydroxyphenylalanine (L-DOPA). That suggests that DA may act as an anti-cretin as postulated by the foregut hypothesis proposed to explain the early effects of bariatric surgery on type 2 diabetes.

So the investigators took a "translational step backwards" to characterize the kinetics of plasma DA and incretin production after a mixed meal challenge in a rat model and study the integration of incretin and DA signaling at the biochemical level in a rodent β -cell line and islets. "We found that there are similar excursions of incretins and DA in rats, as those reported in humans," the authors wrote, "after a mixed meal challenge and that DA counters incretin



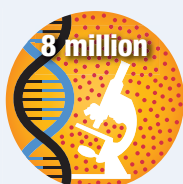
enhanced glucose-stimulated insulin secretion and intracellular signaling at multiple points from dampening calcium fluxes to inhibiting proliferation as well as apoptosis."

The researchers concluded based on their results that DA is an important regulator of insulin secretion and may represent one axis of a gut level circuit of glucose and β -cell mass homeostasis.

Fast FACTS About Gut Microbes



Microorganisms in the body outnumber human cells 10 to 1.



Researchers estimate that the human microbiome contributes some 8 million unique protein-coding genes or 360 times more bacterial genes than human genes.



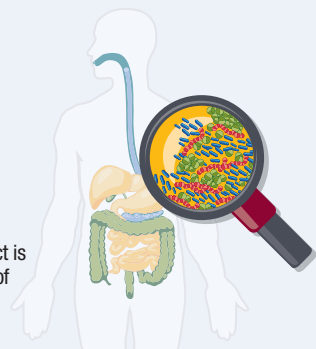
Researchers have found differences between obese and lean people in over 300 bacterial genes, many of which are involved in carbohydrate and lipid metabolism.



The human genome carries around 22,000 protein-coding genes.



Researchers calculate that they have identified between 81% and 99% of all microorganismal genera in healthy adults.

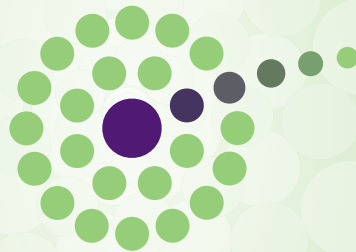


The digestive tract is home to trillions of microbes.



10,000 different species of microbes live in the human body.

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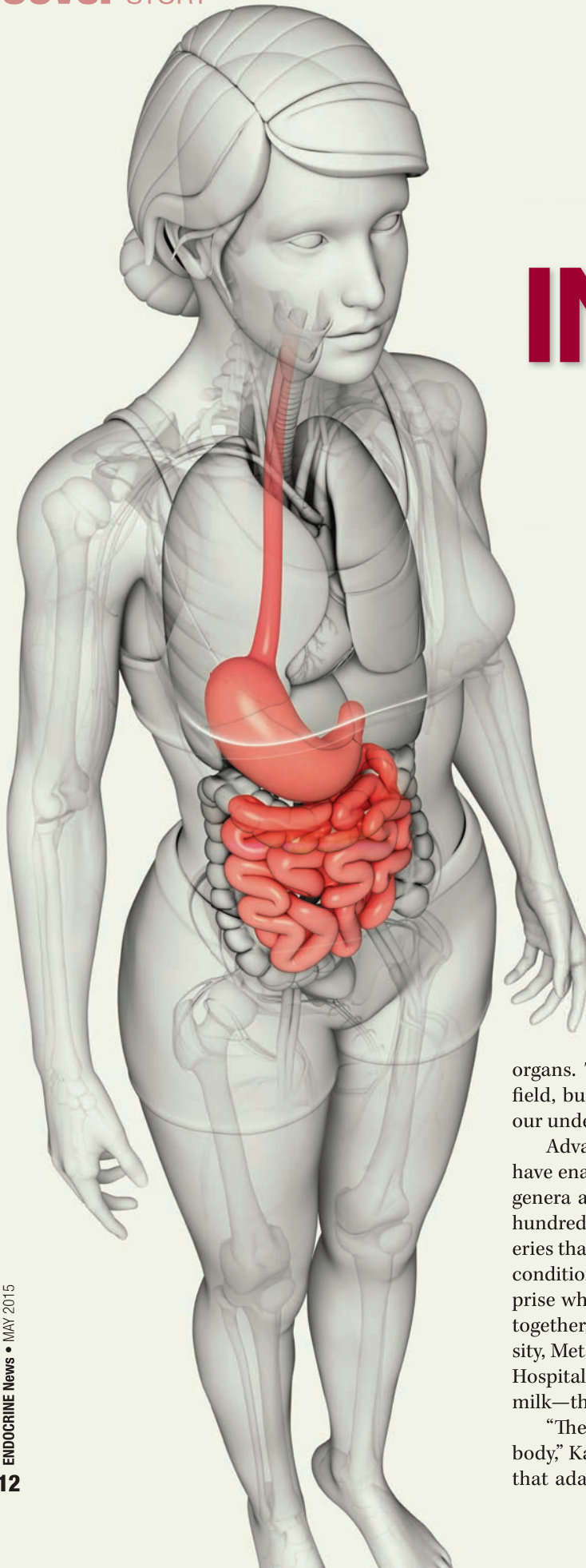


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GUT INSTINCT

Aside from the expected effects the gut microbiome has on metabolism, researchers are finding more and more consequences from the ecosystem inside every GI tract. From hypertension to depression, the gut microbiome influences the entire human body.

By Eric Seaborg

Rather than some disorganized mass of bacteria, the microbiota residing in the human gut can be conceptualized as an essential organ integrated into the body and interacting indispensably with the body's other organs. The study of this internal ecosystem is a relatively new field, but the findings are having wide-ranging consequences for our understanding of many of the body's functions.

Advances in gene sequencing and other genomic techniques have enabled researchers to unlock the effects of specific bacterial genera and species — a daunting task considering that there are hundreds of species in the average gastrointestinal system. Discoveries that the microbiome is a major player in important endocrine conditions, such as obesity and diabetes, should come as no surprise when you consider that humans and their microbes evolved together, according to Lee Kaplan, MD, PhD, director of the Obesity, Metabolism, and Nutrition Institute at Massachusetts General Hospital in Boston. Humans commonly eat food—even a mother's milk—that they could not digest without the help of bacteria.

“The microbiota is not a foreign body, it is part of the human body,” Kaplan says. “You have to be adapted to live in the gut, and that adaptation process has occurred over millions of years. You

AT-A-GLANCE

- Genomics techniques have spawned a new field of research that is revealing the far-reaching impact of the bacteria inside the GI tract on a host of conditions.
- The microbiota's impact is so great that fecal transplants from gastric bypass mice to normal-weight mice can transfer some of the surgery's weight-loss effects.
- In addition to affecting metabolism as might be expected, the gut microbiome has been associated with conditions ranging from hypertension to fatty liver disease to depression.

can think of the microbiota as an organ, and one of its functions appears to be to help regulate metabolic functions in the other organs.”

Why Gastric Bypass Works

One of the first places where this interplay became apparent was in the unexpected aftereffects of Roux-en-Y gastric bypass (RYGB) surgery, such as resolving diabetes long before weight loss occurs, effects on the secretion of gut hormones, and alterations in energy balance.

Researchers discovered several years ago that gastric bypass changes the microbiota, and mice have proven to be a good model for investigating the significance of the changes:

A fecal transplant from an obese human can lead to obesity in a mouse, and the bacterial changes that result from RYGB in mice are similar to those seen in humans. In order to see whether the microbiota itself conveys any of the effects of the surgery, Kaplan's team transplanted gut microbes from mice that had undergone gastric bypass to normal-weight mice. After the transplants, the mice lost about 5% of their body weight and had less body fat, without any alteration in their food intake. Published in 2013 in *Science Translational Medicine*, the report says: “These findings provide the first empirical support for the claim that changes in the gut microbiota contribute to reduced host weight and adiposity after RYGB surgery.”

“The bottom line is that if you transfer the microbiota from animals that had surgery, it transfers some of the weight loss effects and improvement in metabolic function. It tells us that the microbiota is mediating some of the therapeutic physiological benefits of surgery,” Kaplan says. “RYGB surgery does not work by limiting how much food you can eat, and it doesn't work by causing malabsorption. Those are the most common misconceptions. It works by changing physiology, and it changes physiology in hundreds of different ways. One of those ways is through the microbiota.”

This weight-changing power of the microbiome could cut both ways: A recent case in *Open Forum Infectious Diseases* described a woman treated with a fecal transplant for *C. difficile* who became obese. This patient gained 34 pounds over 16 months despite following a medically supervised liquid protein diet and exercise program. The transplant came from her healthy but overweight daughter, who was on her way to becoming obese.

More Calories from the Same Food

Obese people have different microbiota than normal-weight people, and one hypothesis is that the efficiency of their microbiota contributes to weight gain, according to Rosa Krajmalnik-Brown, PhD, an associate professor of environmental engineering at the Swette Center for Environmental Biotechnology at Arizona State University, who was a featured speaker at a recent obesity management workshop co-sponsored by the Endocrine Society and the Obesity Society. “You might have some really efficient microbes that might help you get a lot more energy out of your food, and you can have less efficient microbes that don't allow you to get so much energy out of your food,” she says.

Krajmalnik-Brown's team was the first to describe the changes after gastric bypass. In a 2009 study in the *Proceedings of the National Academy of Sciences*, they compared the microbiota of morbidly obese, normal weight, and gastric bypass patients. The obese subjects had a higher abundance of bacteria that produce hydrogen and of bacteria that take up that hydrogen to produce methane. The researchers proposed that the high hydrogen uptake by these methanogenic bacteria accelerates the fermentation of plant polysaccharides and allows the absorption of



“The microbiota is not a foreign body, it is part of the human body. You have to be adapted to live in the gut, and that adaptation process has occurred over millions of years.

You can think of the microbiota as an organ, and one of its functions appears to be to help regulate metabolic functions in the other organs.”

— Lee Kaplan, MD, PhD,
director of the Obesity,
Metabolism, and Nutrition
Institute, Massachusetts
General Hospital, Boston

otherwise indigestible material.

A 2013 study in the *Journal of Clinical Endocrinology & Metabolism* reported similar findings: People whose breath has high concentrations of hydrogen and methane gases are more likely to have a higher body mass index and percentage of body fat. These researchers also suggested that the breath gases indicated higher amounts of a microorganism that scavenges hydrogen from other bacteria, which helps the host extract nutrients more efficiently.

But improving digestion of some foods is just one way bacteria can affect metabolism. “They make all kinds of enzymes. They regulate ... carbohydrate metabolism, which is what underlies diabetes,” Kaplan says.

“They break down foods ... into short-chain fatty acids that can interact with hormones, like appetite hormones. So they could send signals to the brain of satiety or nonsatiety,” Krajmalnik-Brown says. They also affect bile acid metabolism, which can affect satiety feelings as well as fat production and storage.



“You might have some really efficient microbes that might help you get a lot more energy out of your food, and **you can have less efficient microbes that don’t allow you to get so much energy out of your food.**”

— Rosa Krajmalnik-Brown, PhD, associate professor of environmental engineering, Swette Center for Environmental Biotechnology, Arizona State University, Tempe

Effects Well Beyond Metabolism

Effects on metabolism are the most studied so far, but the known associations of the microbiota continue to grow and include such diverse conditions as colon cancer, hypertension, depression, asthma, irritable bowel syndrome, inflammatory bowel disease, *C. difficile*, fatty liver disease, depression, and brain function. “Microbiota has really only been studied in detail for a decade, so it probably does many more things than we know about,” Kaplan says.

For example, Krajmalnik-Brown’s group published a study in *PLOS One* in 2013 comparing the gut microbiomes of neurotypical and autistic children. They found that autism is closely associated with a distinct gut microflora characterized by reduced diversity.

That reduced diversity seems to be a hallmark of many conditions, and one effect of gastric bypass is to increase diversity. In experiments like Kaplan’s transplants, researchers transfer a whole pool of bacteria without regard to particular species, but researchers are moving toward finding associations of specific effects with specific genera and species. A 2013 study in the *American Journal of Clinical Nutrition* found that bacteria in the genus *Lactobacillus* had a positive correlation with decreases in BMI and leptin.

A 2010 study in *Diabetes* found that *Faecalibacterium prausnitzii*, a dominant species in healthy individuals, is less abundant in patients with diabetes. The researchers reported an inverse relationship between *F. prausnitzii* and the low-grade inflammation state characteristic of obesity and diabetes.

Krajmalnik-Brown says that such findings could one day lead to the development of targeted probiotics derived from humans that could replace the current ones, which are all cow-derived. For the present, clinicians might advise their patients to cultivate a better inner garden by eating more fiber, including more fruit and vegetables. Not new advice, but perhaps one more argument to convince patients that they are what they eat.

“The microbiota has a large role to play not just in disease, but in the normal conditions of healthy people. The microbiota is keeping you healthy, and so an altered microbiota could fail to keep you healthy, and potentially cause disease,” Kaplan concludes. **EN**

— Seaborg is a freelance writer based in Charlottesville, Va. He wrote about inherited endocrine disorders in the February issue.

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No Child Left Behind?

Children are the most delicate and unpredictable of all patients. As charming as their precociousness is, the unique challenges of treating pediatric diabetes make it difficult for researchers to create an artificial pancreas for this endearing population.

By Melissa Mapes

Twenty years ago, Frank Doyle, MS, PhD, wrote his first research proposal as a young professor for a device that could automate insulin delivery. Now known widely as the “artificial pancreas,” researchers around the world are working to refine this technology and bring various iterations to market. But a large problem remains: The current models do not work well for kids.

Teenagers with diabetes provide one subset of challenges. Their bodies demand higher doses of insulin, which leads to greater risk of low blood sugar hours after meals. Young children face entirely different obstacles.

Constant Vigilance

“Young children are quite insulin sensitive, so very small changes in insulin delivery can have a profound effect on the glucose levels,” explains Stuart Weinzimer, MD, associate professor of pediatrics and lead investigator of the Artificial Pancreas Program at Yale University, New Haven, Conn.

“And, behaviorally, young children are quite unpredictable,” he went on. One day may be spent running around a playground, and the next day may include hours of naps and cartoons. This variability in physical activity has tremendous influence on insulin needs, but diet is also a concern. “Young children are notoriously picky eaters. You might give them their insulin and then they decide that they’re not going to eat.”

Parents of children with diabetes often find themselves in this predicament: struggling to keep their son or daughter’s insulin and blood sugar levels in balance and worrying endlessly about a life-threatening dip or spike.

“This is something that can’t be stressed enough,” Weinzimer emphasizes. “Parents sacrifice their lives to this disease. They live in constant fear — *constant fear* — of very severe hypoglycemic reactions. And if they’re successful in avoiding those, they live in fear of long-term complications.”

Mothers and fathers trying to protect their child from blood sugar lows often then see glucose levels getting too high. If they try to avoid highs, then they run the risk of their child having a seizure. As a result, parents end up stressed, burnt out, and depressed. Weinzimer has witnessed time and time again the devastating toll that diabetes can take not just on children but also on their families. “Parents really do have to be constantly vigilant and hovering over their kids to protect them, and it’s hard to have a normal life when you’re doing that,” he says.



AT-A-GLANCE

- An artificial pancreas for adults is expected on the market within five years but will be part of a “staged solution,” meaning many improvements and iterations will be available in future models.
- A pediatric version is a few years behind the adult artificial pancreas due to children’s greater variability in habits, high insulin sensitivity, and their inability to self-manage the disease — all complicating factors for researchers to resolve.
- Scientists hope to implement features like remote monitoring to allow parents to view their child’s blood sugar levels and adjust insulin doses from afar.

Bespoke Mathematical Suites

In 2006, Eyal Dassau, PhD, joined Doyle’s group in the quest for the artificial pancreas, at a time when the team had begun clinical testing of the control design. In the intervening years, literally hundreds of adults have tested a version of the system operating on various forms of the software developed at the University of California, Santa Barbara (UCSB).

With the help of a \$1.8-million grant from the National Institutes of Health (NIH), Dassau — the principal investigator — is working with Doyle and Weinzimer to design a closed-loop system for young children that can offer families some relief. They hope that the pediatric artificial pancreas will allow parents to sleep through the night without worrying about blood sugar dips and even remotely monitor their child’s glucose levels from a mobile device.

Until this study, Dassau and Doyle’s research at UCSB has focused on an artificial pancreas system for adults with type 1 diabetes. They build algorithms that tell the device how much and when to provide insulin.

Doyle claims that the biggest challenge in building the artificial pancreas is uncertainty. “If we knew how the body behaved very precisely, and it was very reproducible hour-after-hour, day-after-day, this would not be a very hard problem,” he explains.

From an engineering perspective, this holds true for any medical control system. Our bodies frequently change, as do our diet and exercise regimens — making insulin demand a moving target. Because of these unpredictable variables, designing an algorithm that will work in all conditions and all people is next to impossible.

So, the UCSB team takes a different approach. Instead of a one-size-fits-all solution, they customize the algorithm to each individual. “We collect data, we inform the algorithm from their medical record, and that is used to initialize the first version of the algorithm

for the subject,” Doyle says.

The studies in adults have shown that the algorithm can learn over time, gaining insight into each patient’s habits and activities. The artificial pancreas further adapts to the individual’s needs as a result. Dassau, Doyle, and Weinzimer plan to take the same tailored approach in their NIH project with children. Their team is adjusting the algorithm to each pediatric participant, along with incorporating other effective techniques from the adult system.

Essential Features

A key part of their algorithm is zone model predictive control. Unlike most mathematical problems, there is no single numeric answer for the correct blood sugar level. The artificial pancreas needs to keep glucose within a certain range rather than trying to reach a specific number. The ongoing stream of information from the glucose sensor made this a challenge. “Glucose sensors are noisy, and that noise will drive a traditional algorithm to keep adjusting the pump,” Doyle explains.

Zone model predictive control combines two notions of engineering to allow the artificial pancreas to distribute the correct amount of insulin without becoming overactive. The first portion, called model predictive control (MPC), manages complex processes and has been used for a variety of tasks for decades, including oil refinement and chemical processing. Doyle and his colleagues developed the zone innovation, which allows it to keep glucose within a range rather than aiming for a target number. “The blood sugars can roam in that range, and the algorithm won’t fight to try to correct,” he continues.

The models of the artificial pancreas that are closest to reaching the market cannot entirely automate blood sugar management. Rather, they offer a hybrid system where patients



“Parents sacrifice their lives to this disease. They live in constant fear — constant fear — of very severe hypoglycemic reactions. And if they’re successful in avoiding those, they live in fear of long-term complications.”

— Stuart Weinzimer, MD,
associate professor, pediatrics;
lead investigator, Artificial
Pancreas Program,
Yale University,
New Haven, Conn.



Managing Diabetes in Children Versus Adults

Researchers are working to overcome a number of obstacles involved in treating children with diabetes, including:

1. Children are more likely to be insulin resistant
2. They cannot self-manage their insulin doses
3. They cannot monitor their blood sugar levels on their own
4. Children have more unpredictable physical activity habits
5. Kids can be picky eaters and may refuse food after receiving insulin
6. They tend to have worse residual beta-cell function than patients with type 1 diabetes that began in adulthood

still input insulin amounts for meals but can rest easy between meal times and at night.

When glucose does start to fall out of line, the device lets the patient know. The researchers are particularly excited to build a wireless tracking system for parents to receive these alerts, even when their child is at school or elsewhere.

“We developed a monitoring system, named E911, that can alert patients and their families on pending hypoglycemia with a GPS location of the event and a link to a Google map,” Dassau says. The warning would be sent to a mobile phone or other remote device.

Weinzimer believes that this is a crucial element of the pediatric artificial pancreas — worth sacrificing a bit of battery life for. “As a pediatric endocrinologist, I’d rather us have remote monitoring capabilities and change the batteries more frequently,” he says.

The scientists are experimenting with different types of technology, such as low-energy Bluetooth, to find a balance between functions and battery duration. They are, for example, trying to find the optimal communication frequency between the computer and the pump. The more often information is transmitted, the more energy the device needs.

Weinzimer has posed a number of additional questions that need answers. “What if you lose connection between your pump and your sensor? Do you have the system suspend, or do you have it fall back into a preset delivery pattern,” he ponders. “How many transmissions

do you need to miss before you get kicked out of closed-loop and fall back into a manual safety condition?” All of these details still need to be worked out.

Version 2.0 and Beyond

Both Doyle and Weinzimer emphasize that the artificial pancreas is a “staged solution.” Within about three years, artificial pancreas systems for adults will likely become available in the U.S., followed a few years later with systems for young children and then teenagers. It will continue to evolve from there.

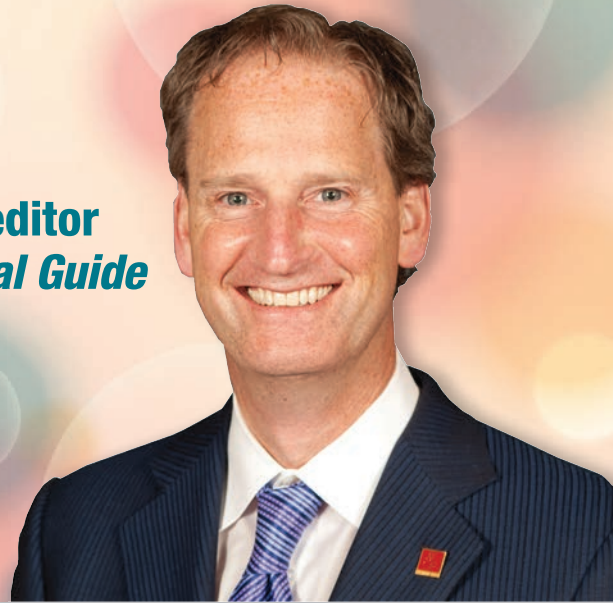
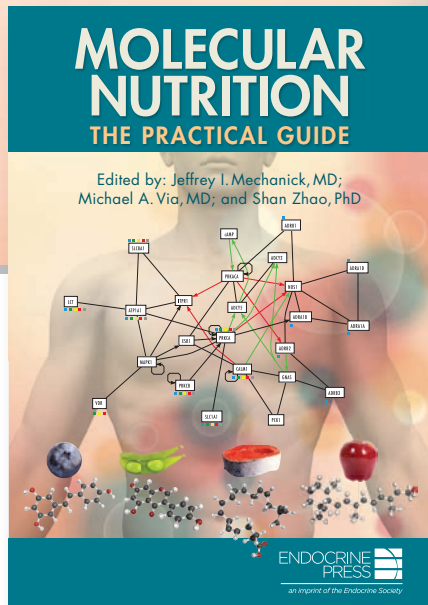
“These systems are not going to take away all the uncertainty, but if they allow for a good night’s sleep, it would be transformative in the lives of some parents,” Weinzimer says.

Doyle imagines a fully automated and invisible technology when he proposed the notion of an artificial pancreas two decades ago — something that could perhaps be implanted rather than external. Once in place, it would allow people with diabetes to live life without ever worrying over their blood sugar levels or injecting insulin. Such a device may someday exist, but for now he and his colleagues are excited to make advances toward a pediatric system. “It is really gratifying to see how far we’ve come,” Doyle says. **EN**

— Mapes is a Washington D.C.-based freelance writer and a regular contributor to Endocrine News. She wrote about advanced business degrees in the April issue.

QA

with **Jeffrey I. Mechanick, MD, editor**
Molecular Nutrition: The Practical Guide



About **JEFFREY I. MECHANICK**

Jeffrey I. Mechanick is clinical professor of medicine and director of metabolic support in the Division of Endocrinology, Diabetes and Bone Disease, Icahn School of Medicine at Mount Sinai, New York, N.Y., where he is responsible for training endocrine fellows at Mount Sinai in nutrition and metabolic support.

He received his MD from the Icahn School of Medicine at Mount Sinai, completed internal medicine residency at Baylor College of Medicine, and completed his endocrine fellowship at the Mount Sinai Hospital. Mechanick authored over 250 publications in endocrinology, metabolism, and nutrition support.

He is the immediate past president of the American Association of Clinical Endocrinologists, chancellor of the American College of Endocrinology, and past president of the American Board of Physician Nutrition Specialists, and also chairs the International Transcultural Diabetes Nutrition Algorithm Working Group. He was appointed as a member of the President's Council on Fitness, Sports and Nutrition Science Board for 2010–2013 and is the 2013–2016 editor-in-chief of the PCFSN quarterly publication *Elevate Health*.

His research interests range from predictive modeling in critical illness, to thyroid cancer, metabolic bone disease, diabetes, and nutrition.

By **Mark A. Newman**

“You are what you eat,” is a phrase that everyone has heard, but there really is some truth to the meaning behind this age-old adage; what you consume can have real effects on your health. This is certainly not a revelation to endocrinologists and other physicians, but as the complexities of nutrition are better understood, the importance of what patients consume is becoming even more apparent. To emphasize this realization, the Endocrine Society recently published *Molecular Nutrition: The Practical Guide* through its Endocrine Press book publishing imprint. Edited by Jeffrey I. Mechanick, MD, Michael A. Via, MD, and Shan Zhao, PhD, this new volume aims to address the discrepancies between the ever-increasing rates of chronic disease with the enhanced knowledge of the interactions between the foodome and nutria-epigenome/metabolome.

“Dr. Mechanick is a true expert in the art and science of nutritional medicine,” says Valentin Fuster, MD, PhD, director of Mount Sinai Heart and physician-in-chief, the Mount Sinai Hospital, and who also wrote the book’s foreword. “This excellent book is a guide to how a patient’s nutritional status may be impacting their overall wellness

and how we as physicians can better heal our patients. This book serves as a strong reminder that we must have the critical discussion with each of our patients about the importance of a healthy lifestyle and nutrition.”

Endocrine News reached out to Mechanick to discuss this intriguing new book that takes a fresh perspective on a well-researched topic, and which will no doubt be a vital tool for all practitioners in endocrinology and beyond. We asked him about what surprised him the most about the book as well as what might surprise readers, and why it should be in every endocrinologist’s library.

Endocrine News: Why was it important for a book like *Molecular Nutrition* to be published by the Endocrine Society?

Jeffrey Mechanick: Explaining the molecular and physiological underpinnings of endocrinology and metabolism has always been emblematic of activities of the Endocrine Society. The traditional teachings of nutritional medicine have now become invigorated with molecular biology and advances in biocomputational sciences, and moreover, have clearly demonstrated overlap with many aspects of endocrinology and metabolism, such as diabetes and obesity. Therefore, publishing *Molecular Nutrition* was a natural step toward this better understanding we all seek.

EN: Have lifestyle and dietary choices by patients been somewhat ignored too much by primary care physicians in the past?

JM: The issue is not whether lifestyle and dietary choices are ignored, for that would acknowledge their existence in formal and continuing medical education and a simple decision or act of omission. Rather, lifestyle medicine, healthy eating patterns, and the role of nutritional science in routine patient care have not risen to the level of even being included in standard medical curriculum, particularly in the clinic and/or bedside teaching settings. Admittedly, this is not a glaring knowledge gap historically, but looking forward, it is a necessary addition to our learning experience as part of furthering a preventive care paradigm and more effective healthcare delivery system.

EN: What will surprise readers the most when they pick up *Molecular Nutrition*?

JM: It should not be a surprise that the interaction of environmental factors (our diet) with our body (our metabolism) occurs at the molecular level. However, *Molecular Nutrition* may reveal new ways of comprehending these interactions and translating them into routine clinical recommendations. For instance, instead of recommending the standard fare of “healthy” foods gleaned from a library of consensus statements and guidelines, one could start with the patient and derive an individualized metabolic target, consider specific molecules that exert a beneficial role on that target, and then assemble a healthy eating pattern based on foods containing those healthy molecules. Perhaps the real wonder though is the use of molecular cooking, or gastronomy, to preserve those strategic molecules, which can be done in your home, outside of a restaurant setting, albeit with a little study and diligence.

EN: What do physicians and patients alike need to understand about food?

JM: That the nature of food is to provide substrate not

only for energy and protein, but also to exert effects at a molecular level that can improve health and potentially prevent disease. This ability is not constant, of course, but as we learn more about the molecular effects of food compounds, these benefits can be better understood and predicted. Also, food should not be vilified, especially in the setting of obesity or diabetes, but rather viewed favorably and even passionately. It is not just about the molecular nature of foods, meals, and eating patterns, but also the benefits from associated socialization and pleasure.

EN: Why has nutrition not been emphasized in medical training as much as it should be?

JM: This is a critical question, and when we have convened various summits in the past to address this, the answers gravitated toward some mysterious deprioritization compared with the “hard” sciences. Perhaps this is due to softer, less precise evidence bases, or perhaps due to a more pervasive nature where many other professional stakeholders lay claim to the field. However, now, with the rising popularity of preventive medicine and the rapid emergence of molecular and technological advances, nutritional medicine, it is hoped, will find a more prominent place in medical education. Along with lifestyle medicine, it is clear we need to fill many gaps in medical education to optimize healthcare.

EN: You state in your preface that *Molecular Nutrition* is not simply a review of the literature, but, rather a presentation of new ideas and treatment protocols. Is that due to more recent advances in the science of molecular nutrition?

JM: Yes. The concepts asserted in *Molecular Nutrition* are of two types. First, we present a fairly large evidence base replete with very recent references that serve as a foundation for later sections. Second, we present a particular way of thinking about molecular nutrition as it directly relates to patient care. In fact, it is the translation of the molecular information into clinical context that is crucial; we provide four scenarios that weave through the book to continually remind the reader about clinical context: wellness, aging, cardio-metabolic risk, and cancer (see graph, opposite page).

EN: What surprised you when you were in the process of compiling the various chapters of this book?

JM: Great question because as we speak of emergence in molecular biology, the process of developing this book was indeed emergent. Drs. Zhou and Via, as well as the invited authors, provided tremendous insight as the book progressed prompting many zigs and zags ultimately steering us toward a final protocol. The original intent was in fact to simply provide a high-quality review of molecular actions of nutrients in specific clinical contexts, but during the process,

Scenario IV: Cancer

Scientific

Clinical

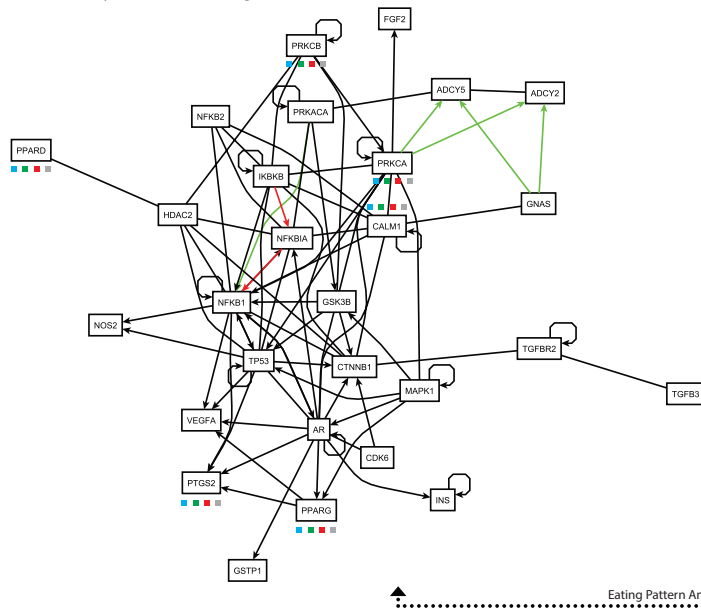
Databases:	Networks:	Current Knowledge:	Analysis Methods:
FoodDB	Protein Interaction Networks	Literature	Statistical Modeling
Gene Ontology	KEGG Pathways	Hypothesis	Network-based Modeling
		Available Metabolites	Combined Modeling

Step 1:
Food selection based on foodome-metabolome interaction

Fruits	Vegetable	Animal	Staple Food	Other
Loganberries	Cress		Potato flour	Alfalfa seeds
Pomegranates	Kohlrabi		Babyfood	Vanilla Extract
Watermelon	Chives		Green Peas	Yogurt

Construct Foodome-Metabolome Interaction Network for Cancer:

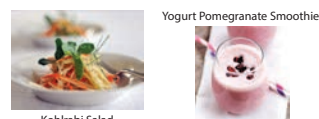
KEGG Pathways and Foodome-Targetable Network



Step 2:
Filtered food selection based on clinical decision factor and personalization

Fruits	Vegetable	Animal	Staple Food	Other
Pomegranates	Kohlrabi		Green Peas	Yogurt

Step 3:
Construction of dishes and meal plans



Step 4:
List of possible compounds to monitor along with clinical parameters

Compounds (S)-Malate	Proteins
9-cis-Retinoic acid	BMP4
Calcium cation	COL4A1
Cholesterol	FGF3
Fumarate	TGFA
Phosphatidate	WNT3A
Retinoate	WNT4
	VEGFA

This figure is featured in Chapter 15 of *Molecular Nutrition*, “Nutrition in Cancer,” which details the importance of proper nutrition in cancer patients. Specifically, this figure emphasizes the various approaches for cancer patients to meet their nutritional needs via adequate food intake as well as supplementation.

we realized that we could construct a cognitive pathway for clinicians to build healthy eating patterns and then communicate them to patients, while also incorporating practical tips on shopping and cooking. I should point out here that molecular nutrition in no way marginalizes traditional dietetics and basic nutritional precepts, but rather pulls all of this information together with new scientific discoveries to synthesize a more comprehensive portrayal of nutritional medicine.

EN: Finally, why is *Molecular Nutrition* a must-read for every endocrinologist?

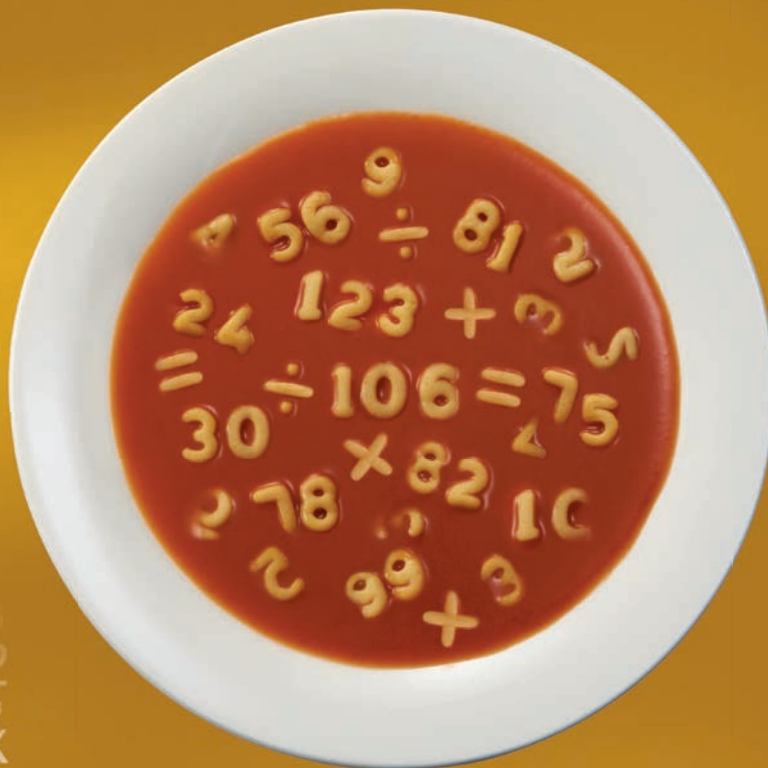
JM: Our belief is that all elements of endocrinology and metabolism incorporate molecular principles that share important pathways with nutritional medicine. And therefore, understanding molecular nutrition can potentially

drive insight and options when managing patients. The real answer will be the feedback received. This is not a standard “vanilla” textbook. This is more of a story, and it is the reader’s epilogue that I am interested in.

According to Fuster’s foreword, *Molecular Nutrition* presents nutritional medicine in a brand-new way, “one that not only offers up a great deal of valuable information for the clinician, but also one that inspires and causes one to ponder deeper questions about physiology and how we clinicians optimize care of our patients,” he writes. “We still are what we eat, but maybe now we are closer to understanding why.” **EN**

—Newman is the editor of *Endocrine News*. He wrote about why various endocrinology professionals chose this field in the March issue.

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48 = 90 82
70 100 42 28
31 ÷ 28 58 X
33 + 35 63



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ENDO 2015 ON THE WATERFRONT

From thyroid cancer-sniffing dogs to honoring the memory of an endocrinology giant, **ENDO 2015** in San Diego gave attendees the chance to bask in the sun as well as in the glow of the best and brightest from the field of endocrinology.

By **Derek Bagley**

For five sunny days in San Diego, California, the Endocrine Society held its 97th annual meeting, once again bringing the world's endocrinologists together to share their ideas. The signs of **ENDO 2015** were everywhere: Lampposts in San Diego's historic Gaslamp District were adorned with banners announcing the meeting. People with lanyards draped around their necks and black ENDO bags on their shoulders smiled at one another as they walked among the yachts and along the harbor.

Downtown San Diego was alive with thousands of attendees — 8,511 in total — all there to hear about the latest developments, the groundbreaking research, or even advice on setting up their own practices and labs.

But it was inside the soaring, 200,000-square-foot Convention Center where the real party happened, where

clinicians and researchers presented 2,428 abstracts, held sessions and press conferences and workshops, and discussed the latest initiatives, advocacy, and public policy.

Diabetes and the Affordable Care Act

The first day of **ENDO 2015** featured a session titled "Implementation of the ACA and the Future of Diabetes Care," moderated by Robert Vigersky, MD, director of the Diabetes Institute at Walter Reed Medical Center in Bethesda, Md., and past president of the Endocrine Society. The session was an update to the policy summit the Endocrine Society held on September 12 of last year in Washington, D.C., which explored the obstacles and challenges of the patient/provider/payer relationship now that the Affordable Care Act (ACA) is in full swing.



Photo credit: Beth Bagley



Photo credit: Beth Bagley

Diabetes is a growing epidemic in the U.S., with more and more people being diagnosed every year, which means ballooning costs to treat this chronic disease that often presents a number of challenges to patients, physicians, and payers alike. And now that the ACA has been introduced, this shift in healthcare policy is bound to have an impact on diabetes care, so it's essential to proceed carefully to benefit everyone involved.

Spending to treat diabetes has increased 41% over the past five years, according to Daniel Einhorn, MD, of the University of California San Diego, who spoke first and touched on the clinical and economic burdens of diabetes in the U.S. That increased spending, coupled with the ongoing shortage of endocrinologists in this country, is causing burnout. Diabetes is a complex disease and often frustrating to treat, Einhorn says, so more and more physicians are simply bowing out of treating it. New therapies are not covered by payors, so endocrinologists are not interested in learning about them; doctors have to "write a small essay" every time they order test strips; and physicians treating complex diabetes often end up in the red. "Those who provide care to patients with diabetes are in a losing proposition," Einhorn says.

Anne Peters, MD, of the University of Southern California, treats diabetes in both the rich and poor areas of Los Angeles, says that the key to treating diabetes is prevention, because "there will be way too many diabetic patients for us all to treat." Diabetes rates are twice as high in the poor areas of Los Angeles, so researchers and other parties have started community diabetes initiatives there. But these are complicated ecosystems that must be changed

carefully. For example, there are many fast food restaurants in poor areas, and fast food restaurants are often major employers of the people who live there, so just getting rid of fast food restaurants is out of the question. One of the first solutions was farmers markets with fresh fruits and vegetables, with these markets accepting food stamps and vouchers from endocrinologists' offices.

Another complication is that the people in these areas are often wary, because researchers typically just come in, gather data, and leave. The University of California Los Angeles had the idea to remake corner stores into nicer stores filled with fresh fruits and vegetables, but UCLA left, and these stores became the targets of crime because they were so much nicer than the others. According to Peters, it's important then to build trust. "You can't do this for a community," she says. "You have to do this with a community."

Right now, there is what Vigersky calls a "severe imbalance" in the supply and demand for endocrinologists, which is further compounded by the tension between guideline-driven care and reimbursement. And that gap could continue to grow as diabetes prevalence increases. He pointed to several solutions to narrow this gap, such as shared decision making in care management and fee-for-service and patient management fee payment reform models, as well as forgiving educational loans for new medical professionals, increasing endocrine fellowship training, and educating primary care physicians on the standards of diabetes care.

Chip Ridgway's Life and Legacy

The morning of the second day of **ENDO 2015**, hundreds gathered to pay tribute to E. Chester "Chip" Ridgway, MD, MACP, of the University of Colorado, a former Endocrine Society president and a titan in the world of endocrinology, who passed away last year. David S. Cooper, MD, of the Johns Hopkins University School of Medicine, and moderator of the Chip Ridgway Memorial Symposium, noted that "thousands of endocrine fellows have benefited from Ridgway's programs." He showed slides of photographs through the years, of smiling fellows standing behind Ridgway, many of whom have gone on to win endocrinology awards and hold prestigious titles and positions, even president of the Endocrine Society, thanks to Ridgway's guidance.

Paul Ladenson, MD, of Johns Hopkins University; Margaret Shupnik, PhD, of the University of Virginia; and Bryan R. Haugen, of the University of Colorado, all talked about Ridgway's influence on their work and careers in medicine, walking the audience through the work they've done under Ridgway's leadership, from studying

ENDO2015

By the Numbers

- **8,511:** Total attendees
- **2,428:** Total abstracts
- **1,794:** Total posters
- **10:** Career Development workshops
- **190:** Early Career Forum attendees
- **175:** The new Obesity Management Workshop attendees
- **172:** Presidential poster competitors
- **50%:** Number of Hormone Health Network Survey respondents who would be willing to volunteer to help with future initiatives
- **245:** Attendees from Brazil, the country with the second most registrants after the U.S.

the cardiac effects of thyroid hormone to thyroid-specific expression and regulation of TSH. (Ridgway's Colorado license plate on his red Jeep read simply "TSH".) They talked about missteps and how Ridgway picked them up and showed them a better or another way to work through the problem, or how he showed them simply another way to reach an answer. The symposium, according to Haugen, was about "remembering the work [Ridgway] brought to the field" and the effects he had on the speakers, the audience, and future generations of endocrinologists.

Dog Days of Thyroid Research

Ridgway was a pioneer in thyroid work, and his influence still seems to be reaching researchers and physicians today. Several groundbreaking thyroid studies were presented at **ENDO 2015**. One that's already made headlines around the world is about Frankie, the male German Shepherd mix who can detect thyroid cancer in urine samples.

Donald Bodenner, MD, PhD, of the University of Arkansas for Medical Sciences in Little Rock, and his colleagues trained Frankie to recognize the smell of cancer in thyroid tissues obtained from multiple patients. They then had 34 patients provide a urine sample to the university thyroid clinic before having biopsies of suspicious thyroid nodules and surgery. Of these 34 patients, 15 were diagnosed with thyroid cancer and 19 were diagnosed with benign thyroid disease. Frankie sniffed each

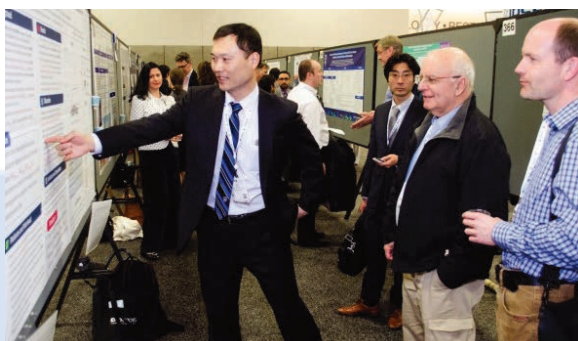
sample, one at a time, alerting his handler to cancer in a sample by lying down and turning away when he detected a benign sample. Frankie's alerts turned out to match the final surgical pathology diagnosis in 30 out of 34 of the study samples. The dog correctly identified thyroid cancer 87% of the time, and he correctly detected the benign samples almost 90% of the time.

Bodenner sees this as an inexpensive and noninvasive way to detect thyroid cancer, and that this technique could be employed in underserved areas and third-world countries. His program will soon be collaborating with Auburn University College of Veterinary Medicine in Alabama to train bomb-sniffing dogs coming back from Iraq and Afghanistan. He said these dogs make the perfect candidates because they've already been trained to detect scents and their handlers "don't know what to do with them." Jason Wexler, MD, of MedStar Washington Hospital Center in Washington, D.C., says that using dogs to detect thyroid cancer in urine samples "could have widespread appeal," since thyroid cancer tests are invasive, painful, and very expensive.

Looking Ahead

ENDO 2015 was a short nine months after last year's meeting in Chicago, but you'll have a little more time to catch your breath this time around. There's a full 13 months between **ENDO 2015** and next year's meeting in Boston, so save the date now: April 1 – 4. Visit **endo2016.org** for more information. **EN**

— Bagley is the associate editor of *Endocrine News*. He wrote about fracking and endocrine-disrupting chemicals in the April issue.



POSTER SESSION Highlight Reel

ENDO 2015 boasted hundreds of interesting sessions spread out over 200,000 square feet. At times, there were 16 concurrent sessions happening. There were also 1,794 posters — around 600 per day — displayed and discussed on the exhibit hall floor. Here are a few of the highlights:

- **Paul Lips, MD, PhD**, of VU University in Amsterdam, the Netherlands, discussed when to treat with vitamin D and how much to use. He says that vitamin D is a controversial issue because "no absolute truths exist." There are barriers to optimal practice, he says, because there are differing opinions and there is no evidence basis. Right now, there are mixed outcomes when treating someone with vitamin D. However, Lips says, we should know by 2020 whether vitamin D can be used to treat or prevent chronic diseases.
- **Lisa Nachtigall, MD**, of Massachusetts General Hospital and Harvard Medical School, echoed what radio personality and acromegaly patient Froggy said in the February issue of *Endocrine News* — the need for more awareness of acromegaly from other healthcare professionals. She called for primary care physicians, dentists, and others to look for the signs of the chronic disease. Nachtigall said she has seen many patients who were told they had polycystic ovary syndrome that turned out to be acromegaly. "All doctors had to do was ask," she says, "Are your feet and hands growing?" It could be cured if caught earlier."
- **Mark D. Deboer, MD**, of the University of Virginia, looked at metabolic syndrome severity and wondered why African Americans are less likely to be diagnosed with metabolic syndrome. He and his team then studied factor loadings (waist circumference, blood pressure, etc.) in different races and quantified them into a score. These scores determined the severity of metabolic syndrome in childhood were positively associated with adult metabolic syndrome severity scores. Deboer and his team concluded that the severity of metabolic syndrome in childhood was associated with incidence of type 2 diabetes and cardiovascular disease.



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References: 1. Alexander EK, Kennedy GC, Baloch ZW, Cibas ES, Chudova D, Diggans J, et al. Preoperative diagnosis of benign thyroid nodules with indeterminate cytology. *N Engl J Med.* 2012;367:705-715; 2. Alexander, Schorr M, Klopper J, Kim C, Sipos J, Nabhan F, Parker C, Steward DL, Mandel SJ, Haugen BR. Multi-center experience with the Afirma Gene Expression Classifier. *J Clin Endocrinol Metab.* 2014; 99(1):119-25; 3. Duick DS, Klopper J, Diggans JC, et al. The impact of benign gene expression classifier test results on the endocrinologist-patient decision to operate on patients with thyroid nodules with indeterminate FNA cytopathology. *Thyroid.* 2012;10:996-1001.

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The following studies, among others, will be published in Endocrine Society journals. Before print, they are edited and posted online in each journal's Early Release section. You can access the journals at www.endocrine.org.



Relationship of Bone Metabolism Biomarkers and Periodontal Disease: The Osteoporotic Fractures in Men (MrOS) Study

• Ulrike Schulze-Späte, Ryan Turner, Ying Wang, Raylien Chao, P. Christian Schulze, Kathy Phipps, Eric Orwoll, Thuy-Tien Dam, and for the Osteoporotic Fractures in Men (MrOS) Research Group

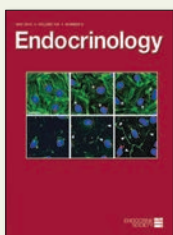
This study suggests that a distinct set of biomarkers of bone metabolism are associated with more severe periodontal disease (PTH, 25(OH)D) and periodontal progression (alpha-CTX, beta-CTX, and CTX) over time.

Impact of Male and Female Weight, Smoking, and Intercourse Frequency on Live Birth in Women with Polycystic Ovary Syndrome

• Alex J. Polotsky, Amanda A. Allshouse, Peter R. Casson, Christos Coutifaris, Michael P. Diamond, Gregory M. Christman, William D. Schlaff, Ruben Alvero, J.C. Trussell, Stephen A. Krawetz, Nanette Santoro, Esther Eisenberg, Heping Zhang, and Richard S. Legro • *In this large cohort of obese women with PCOS, impact of male obesity was explained by female BMI. Lower chance of success was seen among couples where both partners smoked. Obesity and smoking are common among women with PCOS and their partners and contribute to a decrease in fertility treatment success.*

Subclinical Hypothyroidism and the Risk of Stroke Events and Fatal Stroke: An Individual Participant Data Analysis

• Loyal Chaker, Christine Baumgartner, Wendy P. J. den Elzen, M. Arfan Ikram, Manuel R. Blum, Tinh-Hai Collet, Stephan J. L. Bakker, Abbas Dehghan, Christiane Drechsler, Robert N. Luben, Albert Hofman, Marileen L. P. Portegies, Marco Medici, Giorgio Iervasi, David J. Stott, Ian Ford, Alexandra Bremner, Christoph Wanner, Luigi Ferrucci, Anne B. Newman, Robin P. Dullaart, José A. Sgarbi, Graziano Ceresini, Rui M. B. Maciel, Rudi G. Westendorp, J. Wouter Jukema, Misa Imaizumi, Jayne A. Franklyn, Douglas C. Bauer, John P. Walsh, Salman Razvi, Kay-Tee Khaw, Anne R. Cappola, Henry Völzke, Oscar H. Franco, Jacobijn Gussekloo, Nicolas Rodondi, and Robin P. Peeters • *Although no overall effect of subclinical hypothyroidism on stroke could be demonstrated, an increased risk in subjects younger than 65 years and those with higher TSH concentrations was observed.*



Effects of Dulaglutide on Thyroid C-Cells and Serum Calcitonin in Male Monkeys

• John L. Vahle, Richard A. Byrd, Jamie L. Blackbourne, Jennifer A. Martin, Steven D. Sorden, Thomas Ryan, Thomas Pienkowski, John A. Wijsman, Holly W. Smith, and Thomas

J. Rosol • *This study represents a comprehensive evaluation of monkey thyroid C-cells following dosing with a GLP-1 receptor agonist, with a large group size, and measurement of multiple relevant parameters. The lack of effect of dulaglutide on C-cells is consistent with other studies in monkeys using GLP-1 receptor agonists and suggests that non-human primates are less sensitive than rodents to the induction of proliferative changes in thyroid C-cells by GLP-1 receptor agonists.*

Chronic Toxicity and Carcinogenicity Studies of the Long-Acting GLP-1 Receptor Agonist Dulaglutide in Rodents

• Richard A. Byrd, Steven D. Sorden, Thomas Ryan, Thomas Pienkowski, Richard LaRock, Ricardo Quander, John A. Wijsman, Holly W. Smith, Jamie L. Blackbourne, Thomas J. Rosol, Gerald G. Long, Jennifer A. Martin, and John L. Vahle • *Consistent with the lack of morphometric changes in C-cell mass, dulaglutide did not affect the incidence of diffuse C-cell hyperplasia or basal- or calcium-stimulated plasma calcitonin, suggesting that diffuse increases in C-cell mass did not occur during the initial 52 weeks of the rat carcinogenicity study.*



Role of Complement and Complement Regulatory Proteins in the Complications of Diabetes

• Pamela Ghosh, Rupam Sahoo, Anand Vaidya, Michael Chorev, and Jose A. Halperin • *The authors discuss a pathogenic model of human diabetic complications in which a combination of CD59 inactivation by glycation and hyperglycemia-induced complement activation increase MAC deposition, activates pathways of intracellular signaling, and induces the release of pro-inflammatory, prothrombotic cytokines, and growth factors. Combined, complement-dependent and complement-independent mechanisms induced by high glucose, promote inflammation, proliferation, and thrombosis as characteristically seen in the target organs of diabetes complications.*

TLR4 at the Crossroads of Nutrients, Gut Microbiota, and Metabolic Inflammation


• Licio A. Velloso, Franco Folli, and Mario J. Saad • *The authors review the data that place TLR4 in the center of the events that connect the consumption of dietary fats with metabolic inflammation and insulin resistance. Changes in the gut microbiota can lead to reduced integrity of the intestinal barrier, leading to increased leakage of LPS and fatty acids, which can act upon TLR4 to activate systemic inflammation. Fatty acids can also trigger endoplasmic reticulum stress, which can be further stimulated by cross-talk with active TLR4. Thus, the current data support a connection among the three main triggers of metabolic inflammation, and TLR4 emerges as a link among all of these mechanisms.*


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TALENT SCOUT

Hiring the right staff for your laboratory can be a huge factor in the overall success of your research. The ability to spot potential in prospective employees is easier than you think.

By **Melissa Mapes**

The late Steve Jobs once said, “The secret of my success is that we have gone to exceptional lengths to hire the best people in the world.” The team often determines the success or failure of any venture, and the need for talent in laboratory-based research is no exception.

Scientists compete for the most promising prospects to staff their projects. As a result, finding the best candidates and convincing them to come on board takes some finesse.

It starts with knowing the role you are hiring for.

Looking for Potential

A report by the Howard Hughes Medical Institute (HHMI) emphasizes the importance of distinguishing between employees and students. Technicians and postdocs fall under the “employee” category at most universities and research institutions. They receive a salary and must adhere to personnel policies. Students, on the other hand, are there to learn and gain experience, not because they are being paid.

These two sets of relationships require different management techniques and hiring processes. The goal is always to bring aboard intelligent and hard-working employees, but researchers must remember that they

are more of a teacher than a boss when it comes to student staff members. These aspiring scientists can be mentored through their education until they become strong postdoc candidates.

Nobel prize-winning chemist Thomas Cech told the report’s authors, “Early in my career, when I couldn’t attract top postdocs, I put my energy into graduate students and technicians. The graduate students are like raw lumps of clay that have the opportunity to mold themselves into something really great.”

One by One

Rather than rushing to fill an empty lab, a staged approach will ensure better talent. It is a good idea to hire an experienced technician who can assist in training other staff. HHMI recommends looking for someone who is familiar with the administrative processes of the institution. In other words, try to hire this first essential employee from within the organization.

Graduate students can be added to the mix once the lab is up and running and there is time to teach. Postdocs should come on board once the project has grown large enough to where big tasks can be delegated to them. Undergrads, however, cannot usually be designated

substantial responsibility and require oversight. HHMI says to try one out on a single-semester basis and make a decision about continuing his or her role after.

Start Spreading the News

Finding top talent to fill these roles starts with a great job description. It should be both accurate and compelling — delineating the exciting aspects of the research in addition to the responsibilities and necessary qualifications. The human resources department at most institutions will have examples that can be used as a template.

Once complete, the description should be posted on the project's website and shared through other organizational avenues. According to HHMI, the best way to recruit is through word of mouth. Candidates are often discovered at conferences, seminars, or even as students in one's classes.

Postdocs can also be found by posting advertisements in publications and online directories that relate to the research area.

When writing advertisements and speaking to prospects, it helps to share the vision for the lab and its potential impact. Candidates also want to know about the culture and environment they may be entering. Mentorship potential is important too.

"Let potential staff know that they will be working directly with you and that you have an interest in helping them in their careers," the report states. Transparency about funding and job security is also appreciated.

Career Interests

Each individual may have different motivations, but there are trends to how technicians, graduate students, and postdocs seek out positions. Technicians and grad students tend to gravitate toward new laboratories for the opportunity to work closely with principal investigators. Both groups aspire to be included in papers and bolster their education and resumes. For lab technicians, salary may be a strong influencing factor as well.

Postdocs, on the other hand, often prefer well-established laboratories with a proven track record of success. Because of this, it may take a few years for a new lab to attract top postdocs. However, they also take into account the research area, the institution's reputation, networking and career advancement opportunities, and the ability to bring some of their work with them when they leave your lab.

Foot in the Door

After collecting applications, scientists should review all resumes and interview each selected candidate themselves. It is important to contact every reference listed if an individual is being seriously considered.

Publications can be an indicator of success, but HHMI says to keep in mind quality over quantity. Ideally, a postdoc will have one or two lead author credits.

"A middle-author citation indicates that the applicant contributed experimental expertise but may have had less to do with the project's intellectual construct,"

the report authors explained.

Grad students and technicians may also have some investigative experience, but the in-person evaluation is generally a good way to gauge a candidate's knowledge and enthusiasm for the work.

Strong applicants should visit the laboratory and spend time with the other staff members to see how they fit in. Postdocs can be asked to present a seminar to the department, which allows colleagues to provide feedback.

For the structured interview portion, the right questions are key. The same set of inquiries should be asked of each individual, and the interviewer is best off avoiding personal topics to keep the discussion both professional and out of potentially dangerous legal territory.

Short and open-ended questions tend to yield the most informative results. The interviewee should also have plenty of chances to ask questions of their own.

After this, the lead candidate is usually clear. The final step is to make an offer, but keep several other top prospects in the game in case the first choice does not accept.

For more laboratory hiring advice, see www.hhmi.org/labmanagement. **EN**

— Mapes is a Washington D.C.-based freelance writer and a regular contributor to Endocrine News. She wrote about advanced business degrees in in the April issue.



10 SAMPLE INTERVIEW QUESTIONS FROM

At the Helm: A Laboratory Navigator

by Kathy Barker

1. Tell me about your most significant accomplishments.
2. Tell me the part you played in conducting a specific project or implementing a new approach or technology in your lab.
3. Why do you want to work in my lab?
4. Where do you see yourself in five years?
5. What kinds of projects do you want to do? Why?
6. Tell me how you stay current in your field.
7. What motivates you at work?
8. Would you rather work on several projects at a time or on one project?
9. Do you learn better from books, hands-on experience, or other people?
10. Tell me about a project that required you to work as part of a team. What was the outcome of the team's efforts?

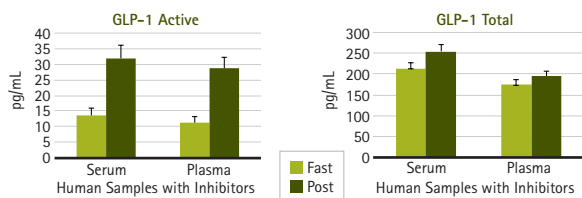
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Congress Passes Two Society Policy Priorities, Repeals SGR, and Renews SDP

On April 14, the U.S. Senate permanently repealed the flawed Medicare formula known as the SGR in an overwhelming 92-8 vote. The action came just hours before a 21% cut to Medicare reimbursement was slated to take effect and follows the passage of companion legislation in the U.S. House of Representatives. *The Medicare Access and CHIP Reauthorization Act of 2015* includes an annual increase of 0.5% through 2019; consolidates various quality improvement programs; incentivizes physicians to participate in alternative payment models like accountable care organizations; and provides a framework of a new system by which to compensate physicians for Medicare services. The Centers for Medicare and Medicaid Services (CMS) is now tasked with determining how this framework should be put into practice.

The Society has advocated for the permanent repeal and replacement of the SGR for many years: Our members have lobbied for the passage of this legislation on Capitol Hill, and staff have met with and provided comments to the Congressional committees as they developed a framework to replace the current system. As the CMS moves forward in its rulemaking process, Society members will have a number of opportunities to weigh in on how this system could work best for endocrinologists. The Society will provide additional information and details for member feedback so that we can help influence implementation.

The Society also successfully worked to

have the Congress include the renewal of the Special Diabetes Program (SDP) in the *Medicare Access and CHIP Reauthorization Act of 2015*. This has been a top priority for the Society. Several weeks ago, members of the Advocacy and Public Outreach Core Committee (APOCC) and Research Affairs Core Committee (RACC) were on Capitol Hill advocating for the renewal of this program, which allocates \$150 million for research on type 1 diabetes and an additional \$150 million for education and prevention programs for American Indian and Alaska Native populations with type 2 diabetes. The inclusion of this program in the legislative package was critical to ensuring the continuation of key research, education, and prevention programs on diabetes.

Thank you to all of our members who took action over the last few months to help push this legislation over the finish line. Your advocacy efforts make all the difference. To learn more about how you can get involved with the Society's advocacy programs, please email Meredith Dyer, associate director, Health Policy at mdyer@endocrine.org.

Endocrinologists Take to the Capitol for ES Hill Day

The spring is always hectic in Washington, D.C. It is the time of year when tourists flock to D.C. for cherry blossoms, school trips take in the historic sites, and Congress is hard at work on several legislative deadlines, including the federal budget, appropriations, and repeal of Medicare's flawed physician payment system. On March 25, RACC and APOCC members participated in a Hill Day focused on research-related topics (our clinician Hill Day will occur later in the year) and the day was a smashing

success! Our members talked with about 30 congressional offices about increased funding needs for the NIH, renewal of the SDP, and the importance of including sex differences in basic research.

Our members were well received, and their messages resonated. Several offices said they would not only support our requested level of funding for NIH (\$32 billion) but also work with us to push for a redoubling of the NIH budget. Our meetings helped solidify the inclusion of the reauthorization of the SDP in the *Medicare Access and CHIP Reauthorization Act of 2015* that was passed April 14. All of the offices we visited were very interested in the sex differences issue and willing to work with us on legislation. In addition to the reaction we got from congressional offices, it was wonderful to see our members infected with “Potomac Fever.” While it is easy to be cynical about Congress, when you come here and participate in the process, it is exciting to see work actually being done. ES members interested in participating in grassroots advocacy are encouraged to contact Mila Becker, senior director for advocacy and policy programs at mbecker@endocrine.org.

Society Participates in Workshop on Type 1 Diabetes Research

On April 8-9, the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) conducted a workshop on research supported by the “Special Statutory Funding Program for Type 1 Diabetes Research.” Otherwise known as the SDP, this program is a special additional source of research funds appropriated by Congress specifically for type 1 diabetes research and administered by the NIDDK through the Diabetes Mellitus Interagency Coordinating Committee (DMIC). The SDP has “enabled the creation of unique, innovative, and collaborative research consortia and clinical trials networks.” The SDP is currently authorized through fiscal year (FY) 2015; this meeting evaluated proposals in anticipation of continued funding through FY16.

During the workshop, scientific and lay experts discussed opportunities for new research projects and continuation of existing research programs in type 1 diabetes. Workshop participants evaluated basic, translational, and clinical research proposals spanning a variety of topics. Topics included several research areas in addition to resource development projects, workforce development, and Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR). Endocrine Society members Richard Bergenstal, MD, Robert Eckel, MD, Irl Hirsch, MD, Michael S. German, MD, Georgeanna Klingensmith, MD, and Robert Sherwin, MD, participated in the workshop.

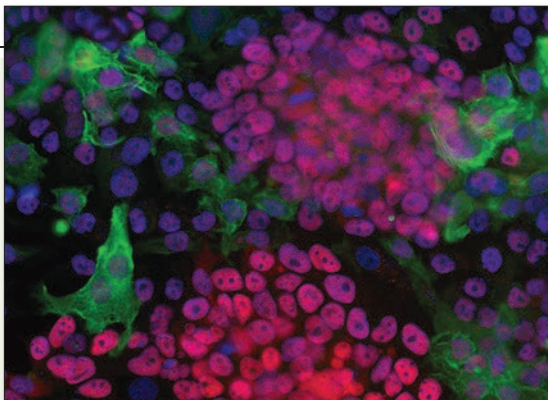
Meaningful Use Rules Outline Changes to the Program for 2015 and Beyond

The CMS released a Notice of Proposed Rule Making (NPRM) on March 20, which outlines the requirements for Stage 3 Meaningful Use for eligible professionals (EPs), eligible hospitals, and critical access hospitals in the EHR Incentive Programs. The CMS believes that the provisions in the rule will provide more flexibility to EPs by:

- Establishing a single, aligned reporting period for all providers based on the calendar year
- Allowing providers the option to start Stage 3 of meaningful use in either 2017 or 2018 (required in 2018), which gives providers an extra year to begin participation in the program than under current regulation
- Simplifying meaningful use objectives and measures and reporting requirements by allowing flexible measures under health information exchange, consumer engagement, and public health reporting that would fit their own patient population or practice
- Reducing the overall number of objectives to eight to focus on advanced use of EHRs
- Removing measures that are redundant or received wide-spread adoption
- Aligning clinical quality measure reporting with other CMS programs

The reaction from the medical community has been mixed, with some citing their appreciation that the CMS is attempting to align the requirements of the incentive program and provide greater flexibility. However, there continues to be concern that the requirements are too arduous, the timelines are too aggressive, and much of the ability to meet the requirements is based on patient use of their electronic health records. The Endocrine Society will be submitting comments on the NPRM, which is expected to be finalized this fall.

In a separate Proposed Rule released on April 10, the CMS outlined modifications to the Meaningful Use program in 2015 through 2017. This proposed rule would change the EHR Incentive Program reporting period in 2015 to a 90-day period aligned with the calendar year. In addition, this proposed rule would modify the patient action measures in the Stage 2 objectives related to patient engagement by reducing the requirement for patients to use technology to electronically download, view and transmit their medical records from 5% of EPs' patients to just one patient. Finally, it would streamline the program by removing reporting requirements on measures that have become redundant, duplicative, or topped out through advancements in EHR function and provider performance for Stage 1 and Stage 2 of the program. The proposals are expected to be finalized as soon as this summer. **EN**



ENDO 2015 SAW THE DEBUT OF THE ENDOSCOPES COMPETITION that featured a variety of images taken right from researchers' microscopes and displayed throughout the conference. The winner is Sandra Grimm from the Baylor College of Medicine for her image, "Pretty Flowers." The image is DCIS breast cancer cells stained for progesterone receptor (red) and keratin 14 (green). Nuclei are stained

blue. The cells that express high levels of PR cluster together and lose K14 expression. The image was captured using a Nikon Eclipse 80i microscope with a Photometrics Coolsnap cf CCD camera at 20x magnification (Nikon Plan Apo 20X/0.75). A rotating selection of images was presented on a flatscreen television monitor at the Life Sciences Pavilion, and attendees cast their ballots for their favorites.

Endocrinology EIC Featured on Australian Television



In March, Andrea Gore, PhD, a researcher and professor at the University of Texas and editor-in-chief of *Endocrinology*, was featured on the Australian science news show *Catalyst*. Gore, along with a panel of American, Australian, Canadian, and New Zealander experts, discussed chemicals' effects on the body in a segment called "Our Chemical Lives."

The program pointed out that more than 80,000 chemicals are used in everyday products, saying that it's "impossible to escape them" and that there is a "growing concern that these chemicals are not safe."

Gore focused on endocrine-disrupting chemicals (EDCs) — her area of expertise — explaining that EDCs mimic or interfere with hormones, which can have "very devastating consequences."

The panel then discussed bisphenol A (BPA) and the fact that some countries are reducing or even banning its use in packaged products. France, for example, introduced legislation to ban BPA in products that come in direct contact with food, while industry groups call for the ban to be overturned. And the European Food Safety Authority has temporarily lowered the safe limit of BPA from 50 micrograms to four micrograms, pending studies.

However, Gore said that four micrograms is arbitrary and she believes that if a chemical is an endocrine disruptor it cannot be considered safe at any level. Gore also took issue with the fact that the people who are involved in the BPA decision-making process are being influenced by "groups that have a vested interest in those products." "I consider it a conflict of interest," she said.

Finally, Gore gave viewers tips on how they can minimize their exposure, such as buying fresh fruits and vegetables, minimizing trash output, and keeping a clean house to minimize exposure to chemicals from bug sprays.

Watch the video of the program and read the transcript at <http://www.abc.net.au/catalyst/stories/4207313.htm>. **EN**

Wysham Named Society CPT Advisor

Carol Wysham, MD, has been named the Society's advisor to the American Medical Association's Current Procedural Terminology (CPT) Advisory Committee, which oversees the development and refinement of CPT codes. Wysham has been a key thought leader in the Endocrine Society for more than 20 years and has extensive experience in coding and reimbursement through her decades of work in clinical practice. The Society looks forward to continuing to work with Wysham in her new position. **EN**



Event CALENDAR

JUNE 5 – 9, BOSTON

American Diabetes Association Annual Conference
www.diabetes.org

SEPTEMBER 8 – 12, MIAMI

Clinical Endocrinology Update
www.endocrine.org/ceu

OCTOBER 9 – 12, SEATTLE

American Society for Bone and Mineral Research Annual Meeting
www.asbmr.org

OCTOBER 17 – 21, CHICAGO

Neuroscience 2015
www.sfn.org

OCTOBER 18 – 23, ORLANDO

Thyroid ITC 2015
www.thyroid.org

NOVEMBER 1 – 7, LOS ANGELES

Obesity Week 2015
www.obesity.org



Society Issues Statement on Screening for Thyroid Dysfunction

On March 24, 2015, the U.S. Preventive Services Task Force (USPSTF) issued its final statement on Screening for Thyroid Dysfunction. While the USPSTF changed the scope of its recommendation statement to screening for thyroid dysfunction to emphasize that screening can detect biochemical abnormalities as well as potentially clinically important disease, the USPSTF's ultimate assessment remained the same as in the previous recommendation. The Task Force concluded that the current evidence is insufficient to assess the balance of benefits and harms of screening for thyroid dysfunction in nonpregnant, asymptomatic adults. This final report was published in the *Annals of Internal Medicine*.

While the Society agrees with the USPSTF statement that universal screening for thyroid disorders is not recommended, it does strongly support screening for thyroid dysfunction in specific situations, especially in relation to pregnancy.

In accordance with the Society's Clinical Practice Guideline, *Management of Thyroid Dysfunction during Pregnancy and Postpartum*, the Society supports the following recommendations to our clinician members and the public:

1. Thyroid function testing is normal practice in caring for patients who have symptoms or signs suggestive of hypothyroidism or hyperthyroidism, goiter, or a history of thyroid irradiation.
2. Universal screening of healthy women for thyroid dysfunction before pregnancy is not recommended. However, women who intend to become pregnant and are considered "high risk" for thyroid illness should be tested. This includes women over age 30 years, with a family history of autoimmune thyroid disease or hypothyroidism, goiter, known thyroid autoantibodies, symptoms or clinical signs suggestive of thyroid hypofunction, type 1 diabetes, infertility, prior history of preterm delivery, prior therapeutic head or neck irradiation, prior thyroid surgery, or currently receiving levothyroxine replacement therapy.
3. Because of the significant incidence of thyroid disorders among pregnant women and the known adverse effects on pregnancy, the Endocrine Society strongly supports testing all pregnant women for elevated TSH concentrations by the ninth week of pregnancy or at the time of their first visit during pregnancy, or at a minimum, aggressive case finding to identify and test high-risk women as defined above.
4. Women with thyroid autoimmunity who are euthyroid in the early stages of pregnancy are at risk of developing hypothyroidism and should be monitored for elevation of TSH above the normal range for pregnancy and treated with levothyroxine when appropriate.
5. Women known to have thyroid autoantibodies, a history of postpartum thyroiditis or type 1 diabetes should have TSH measured at 6 – 12 weeks postpartum and at six months postpartum, or as clinically indicated. Patients with elevated TSH levels should be considered for levothyroxine treatment when appropriate.

While the Society supports the USPSTF's call for more research into thyroid disease screening studies, it also encourages physicians and their patients to discuss the specific situations when thyroid function testing and treatment may be appropriate. **EN**

Wartofsky Named Editor-in-Chief of *Endocrine Reviews*

Leonard Wartofsky, MD, chairman emeritus of the Department of Medicine at Washington Hospital Center in Washington, D.C., has been named editor-in-chief of *Endocrine Reviews*.

Endocrine Reviews publishes bimonthly comprehensive, authoritative, and timely review articles balancing both experimental and clinical endocrinology themes. The journal has repeatedly ranked first in Impact Factor among more than 100 journals in the "Endocrinology & Metabolism" category of Thomson Reuters' annual "Journal Citation Report", including in the most recent 2012 and 2013 editions.

"It is truly an honor to take the helm of such a prestigious scholarly journal," Wartofsky says. "*Endocrine Reviews* publishes comprehensive and authoritative review articles that address current trends in experimental and clinical endocrinology as well as related areas. As editor-in-chief, I will strive to maintain and build on the journal's reputation for excellence."

In addition to his position at the Washington Hospital Center, Wartofsky is a professor of medicine, anatomy, physiology, and genetics at the Uniformed Services University of the Health Sciences in Bethesda, Md., professor of medicine at Georgetown University and clinical professor of medicine at the University of Maryland, Howard University, and George Washington University Schools of Medicine. He is a past president of both the Endocrine Society and the American Thyroid Association. The Endocrine Society has honored him with the Robert H. Williams Distinguished Leadership Award and Distinguished Educator Award.

Wartofsky previously served as editor-in-chief of the *Journal of Clinical Endocrinology & Metabolism*. An internationally renowned expert in clinical thyroid disease with emphasis on patients with thyroid cancer, Wartofsky has published more than 300 articles and book chapters and has lectured across the globe.

Wartofsky's term as editor-in-chief began May 1.





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THYROID CANCER

Associated organ/gland:

Thyroid, pituitary gland

Related hormones:

Triiodothyronine (T3), thyroxine (T4), thyroid stimulating hormone (TSH)

Nearly two out of three cases of thyroid cancer are diagnosed in people younger than age 55. About 2% of cases occur in children and teens.

BREAST CANCER

Associated organ/gland: Ovaries

Related hormones:

Estrogen, progesterone

Breast cancer is the most common type of cancer in U.S. women, regardless of race or ethnicity.

PROSTATE CANCER

Associated organ/gland: Prostate, testes

Related hormones: Testosterone, androgen

In 2014, there were an estimated **233,000** new cases of prostate cancer, making it the leading type of new cancer cases in U.S. men.

BONE CANCER (OSTEOSARCOMA)

Associated organ/gland: Pituitary gland

Related hormone: Growth hormone

Most cases occur between ages 10 and 30, with teens being most commonly affected. About 10% of all osteosarcomas occur in people over age 60.

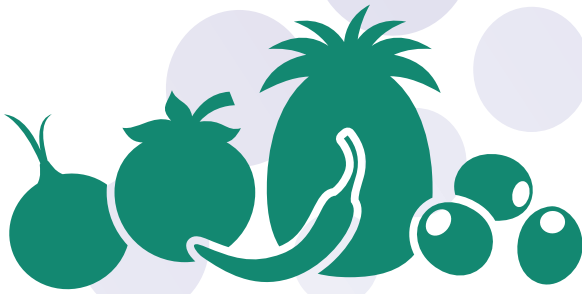
OVARIAN CANCER

Associated organ/gland: Ovaries, uterus, fallopian tubes

Related hormones: Estrogen, progesterone

About 90% of women who get ovarian cancer are older than age 40, with the greatest number of cases occurring in women age 60 or older.

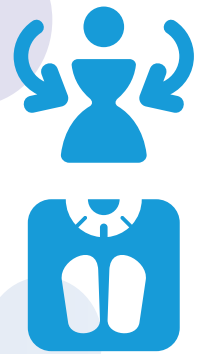
healthy lifestyle = hormone health = cancer prevention



Eat a healthy, Mediterranean diet with lots of fruits and vegetables



Don't use tobacco products



Maintain a healthy weight



Avoid alcohol—or, if you drink, do so in moderation



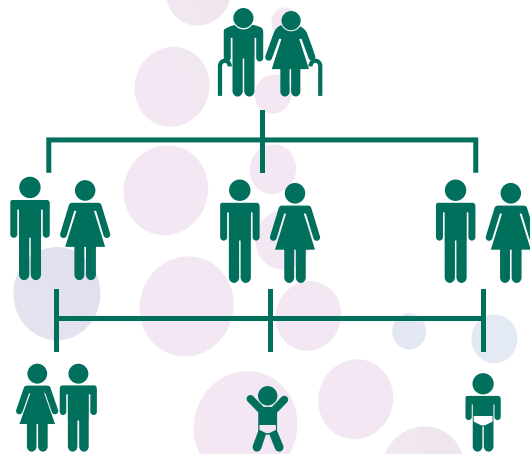
Take vitamin D3 (4000IU/day) and aspirin (6 tablets/week)



Get plenty of daily activity



Have your recommended cancer screenings and check-ups



Know your family history and cancer risk factors



Protect your skin when outdoors

You have questions. We have answers.

The Hormone Health Network is your trusted source for endocrine patient education. Our free, online resources are available at hormone.org.

Additional editing by Carol A. Lange, PhD, University of Minnesota

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