

JULY 2016

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

Endocrine news

Pediatric Pathways

THE IMPORTANT ROLE OF ENDOCRINE SCIENCE IN THE HEALTH AND DEVELOPMENT OF CHILDREN

- **Tipping the Scales:** Sedentary kids and their risk of developing diabetes as adults.
- **Young & Restless:** What's the real link between hyperactive kids and broken bones?
- **Growing Concerns:** The ongoing debate linking growth hormone to strokes.
- **Mind the Gap:** Navigating the rocky road of transitioning pediatric patients to adult care.

WHY ENDOCRINOLOGY:

Angel Nadal, PhD, on winning a game of chance.

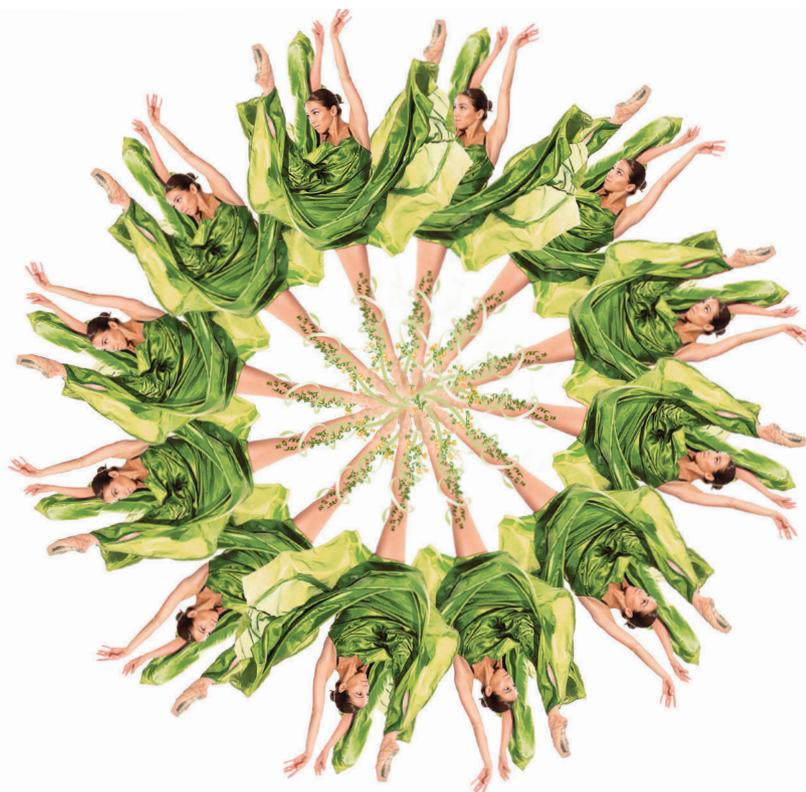
JOLLY GOOD FELLOWS:

The debut of the Society's new educational program.

ENDOCRINE
SOCIETY 

1916-2016
100 YEARS
OF HORMONE SCIENCE TO HEALTH

Bring your biomarkers to life with multiplex assay consistency.

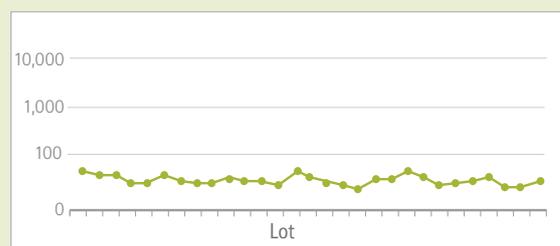


Bring your biomarkers to life with consistent and flexible multiplexing.

As the original leaders in developing MILLIPLEX[®] MAP bead-based immunoassays for simultaneously measuring multiple biomarkers per sample, Merck Millipore stands by its decades-old promises:

- Flexible off-the-shelf panel configurations
- Stringent analytical validation
- Unmatched lot-to-lot consistency
- Measure multiple circulating, or intracellular markers simultaneously

Combined with our expertise in instrumentation, software, technical and sales support, and custom assay development, MILLIPLEX[®] MAP multiplex panels may be your fastest road to your next great discovery.



Consistent biomarker quantitation, lot to lot. Trend chart shows consistent MFI values for each analyte's standard curve across 29 lots. ($\pm 10\%$ of reference lot)

Download our Analyte Quarterly brochure to start building your scientific success.

www.merckmillipore.com/milliplex

Merck Millipore is a business of MERCK



FEATURE

18 | Growing Concerns

Ever since a French study linked growth hormone therapy to strokes two years ago, the debate has raged on in the endocrinology community. While most agree that more studies are needed, researchers disagree on how to proceed.

BY DEREK BAGLEY

FEATURE

24 | Tipping the Scales

It's not unusual when research proves the benefits of what parents have been telling kids for generations: "Go outside and play!" Mom was right: sedentary kids have a higher risk for getting diabetes in adulthood, according to a new study.

BY KELLY HORVATH

FEATURE

28 | Mind the Gap

As a pediatric patient transitions to adult care, the challenges can be overwhelming, not just for the patients...but also for the clinician. Maneuvering through this often arduous transition takes skill, compassion, and, most importantly, patience.

BY DEREK BAGLEY

FEATURE

34 | Young & Restless

A new study shows that there's a link between kids with ADHD and broken bones...but it may not be the link you think it is.

BY MARK A. NEWMAN



FROM THE **EDITOR**

Pediatric Endocrinology: The Kids Aren't All Right

JULY MARKS THE HALFWAY POINT IN THE YEAR OF ENDOCRINOLOGY as we continue to celebrate the Endocrine Society's centennial. And it seems fitting that we are spotlighting pediatric endocrinology in this issue as the Society prepares to look forward, since the first year of our second 100 years is only a few months away.

On page 18, associate editor Derek Bagley tackles the debate surrounding the possible link between administering growth hormone in children and the chance of stroke in these patients later in life after attending a session on this topic at ENDO 2016 in Boston in April. In "Growing Concerns" he talks to the authors of the French study that sparked this debate as well as other experts in the growth hormone field. One of the original authors of the study, Jean-Claude Carel, MD, head of the Department of Pediatric Endocrinology at Robert Debré Hospital in Paris, France, says that despite the recommendation of the Endocrine Society to perform more rigorous studies, he feels that his study's original findings "could be true and [we should] keep working on it."

When I first read "Tipping the Scales," (p. 24), Kelly Horvath's article about how sedentary kids have a higher risk for getting diabetes in adulthood, I had to admit that I wondered how I was spared, since one of my summer activities as a kid in Jackson, Ala., was watching *All in the Family* reruns while eating a pillow-sized bag of Golden Flake potato chips! I think it helped that in my early teens I participated in marching band thus shedding many unwanted pounds. In the article, there are several valid points made that seem like common sense, such as a comment from Casey Crump MD, PhD, Icahn School of Medicine, Mount Sinai Hospital, New York, N.Y., who says that "Exercise requirements are higher for youth because it's a period of rapid growth, and more exercise is needed in order for muscles, bones, and the cardiovascular system to grow and develop properly." Which is a better way of saying, "Put down the potato chips and go outside!"

Derek has a second feature in this issue on the difficulty of transitioning young patients from pediatric to adult care and the challenges faced by not just the patient but by the clinicians as well. In "Mind the Gap" (p. 28) Derek spoke to clinician Carol Greenlee, MD, of Western Slope Endocrinology in Grand Junction, Colo., who says that she has seen too many patients develop complications simply because there was not a smooth continuity of from childhood into adulthood. "What hurts my heart most is the personal cost. I've seen people resurface in their 30s after what I call 'wandering in the wilderness' for 10 years [of not getting adequate care as a young adult]," she says. "And then they show up again and they've got protein in their urine, they've got retinopathy, and your heart just sinks and you feel so sad. That causes the cost that I think all of us would like to stop." **EN**

— **Mark A. Newman**, Editor, *Endocrine News*

JULY 2016

Endocrine news

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

Editor: **Mark A. Newman**
mnewman@endocrine.org

Associate Editor: **Derek Bagley**
dbagley@endocrine.org

Art Director/Design: **Catherine Neill Juchheim,**
CNJ Creative, LLC
www.cnjcreative.com

Production Manager: **Cynthia Richardson**
crichardson@endocrine.org

Prepress & Printing: **Cenveo Publishing Services**
www.cadmus.com

Endocrine News is a registered trademark owned by the Endocrine Society.

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



President: **Henry M. Kronenberg, MD**
hkronenberg@partners.org

President-Elect: **Lynnette K. Nieman, MD**
president@endocrine.org

Past President: **Lisa H. Fish, MD**
lisafishmd@gmail.com

Secretary-Treasurer: **Richard S. Legro, MD**
rlegro@hmc.psu.edu

Chief Executive Officer: **Barbara Byrd Keenan, FASAE, CAE**
bbkeenan@endocrine.org

Chief Publications Officer: **Richard O'Grady, PhD, CAE**
rogrady@endocrine.org

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.

*Endocrine News** is published 12 times a year by the Endocrine Society, 2055 L Street, NW, Suite 600, Washington, DC 20036
Phone 202-971-3636 • Fax 202-736-9708
www.endocrine.org.

Print ISSN 2157-2089 Online ISSN 2157-2097
Copyright © 2016 by the Endocrine Society.
All rights reserved.

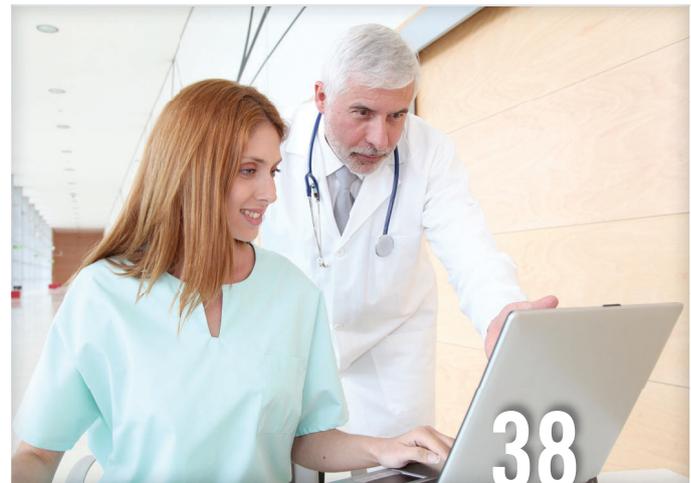
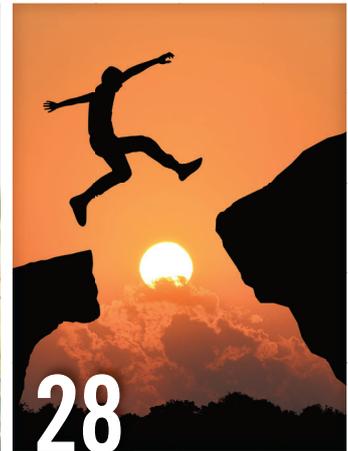
- Please send letters to the editor, comments, and suggestions for *Endocrine News** to mnewman@endocrine.org.
- Product print and product online display advertising, by Pharmaceutical Media, Inc., contact Joe Schuldner, jschuldner@pminy.com, or John Alberto, jalberto@pminy.com.
- For classified print advertising by Pharmaceutical Media, Inc., Dan Simone, dsimone@pminy.com
- For classified online advertising by endocareers@endocrine.org

The statements and opinions expressed in *Endocrine News** are those of individual authors and do not necessarily reflect the views of the Endocrine Society.

Advertising appearing in this publication does not constitute endorsement of its content by *Endocrine News* or the Endocrine Society.

IN THIS ISSUE

JULY 2016



2 | FROM THE EDITOR

Pediatric Endocrinology: The Kids Aren't All Right

4 | PRESIDENT'S VIEWPOINT

Become an Advocate

6 | WHY ENDOCRINOLOGY?

A Game of Chance

BY ANGEL NADAL, PHD

8 | IN TOUCH

Meet Krista Kirk, the Society's new HR chief; ICE-CSE 2016 hosts First Joint Global Symposium on Obesity; the evolving Society Publications; EndoCares launches in Peru.

13 | ENDOCRINE ITINERARY

Endocrinology meetings that span the globe.

14 | DASHBOARD

Highlights from the world of endocrinology.

15 | TRENDS & INSIGHTS

A look at the latest research

38 | PRACTICE RESOURCES THE LEARNING CURVE

The Endocrine Society introduces the Fellows Training Series, a new educational series that benefits both clinical trainees and program directors.

BY KELLY HORVATH

40 | ADVOCACY

NIH gets a \$2 billion funding boost; NIDDK, NICHD advisory councils discuss global health; AMA approves Society-supported policies at its annual meeting; European Commission's overreaching decision fails to protect public health.

43 | HORMONE HEALTH NETWORK

Bariatric surgery and adolescents

45 | CLASSIFIEDS

Career opportunities

www.endocrine.org



Follow us on Twitter:
@Endocrine_News

ENDOCRINE
SOCIETY

1916-2016
100 YEARS
OF HORMONE SCIENCE TO HEALTH

Become an Advocate

Endocrine Society President Henry M. Kronenberg, MD, meets with Congressman Joe Kennedy (D-MA) during the Society's Hill Day in April.



THE ENDOCRINE SOCIETY REPRESENTS MORE than 18,000 scientists and clinicians through advocacy with policy makers around the globe. Our policy priorities include:

- Urging the U.S. Congress to provide substantial, sustainable, and predictable federal funding for biomedical research;
- Influencing the European Commission's impact assessment on endocrine disrupting chemicals (EDCs); and
- Working with policy makers worldwide to improve access to care for all our patients.

In addition, the Society works on a wide spectrum of policy issues that have enormous impact on our members from physician payment to quality improvement, coverage of new medical technologies and treatments, rules on government travel to scientific conferences, and the inclusion of female animals, tissues, and cell lines in basic research.

This past April, I joined several Endocrine Society colleagues in Washington, D.C. for a Hill Day in which we met with congressional offices to discuss the need to extend Medicare coverage to continuous glucose monitors and the value of endocrine research. One of the high

points of the day for me was meeting with Congressman Joe Kennedy (D-MA), and hearing his appreciation of the Society and what we do. He couldn't stress enough what a difference it makes to have researcher and physician constituents weigh in on important policy issues. I also saw firsthand the impact we have – by the end of the day we had successfully convinced several members of Congress to support legislation; these actions happened simply because we shared our perspective with them.

“
...It's not enough
for organizations
like ours to
advocate for
science and
practice — policy
makers want
to hear from
constituents, too.
”

Another example of how Society members are shaping policies relevant to researchers is our ongoing work with the National Institutes of Health (NIH). In May, for example, we visited with the director of the National Institute of Child Health and Development (NICHD). NICHD is the second largest source of funding from NIH for our members. Society members Richard Legro and Carole

Your Advocacy Toolkit

PRESIDENT'S VIEWPOINT



TAKE ACTION

The Society sends action alerts when policy makers are making policy decisions. Consider taking action.

WRITE TO CONGRESS

Visit the Society's online legislative action center to find current advocacy campaigns you can participate in at endocrine.org/advocacy

SHARE YOUR STORY

Newspaper commentaries and letters to the editor are widely read by elected officials, their aides, and the public. Contact the Society's media relations staff to learn opportunities to share your story.

ATTEND A LOCAL MEETING

Elected officials often host town halls to share ideas and concerns. It is a great opportunity to present your view.

CONNECT ON SOCIAL MEDIA

Social media has changed the way the public communicates with policy makers. Join the conversation on Twitter by following [@TheEndoSociety](https://twitter.com/TheEndoSociety)

VOLUNTEER ON A COMMITTEE OR TASK FORCE

Several Society committees and task forces participate in advocacy efforts. Contact govt-prof@endocrine.org and let us know the issues that interest you.

Mendelson shared our priorities and concerns with the senior leadership of the Institute, particularly the need to maintain support for the next generation of researchers. NICHD acting director, Catherine Spong, assured us that moving forward the NICHD will have a greater focus on individual awards to trainees.

In June, Society members, Jean-Pierre Bourguignon and Richard Ivell, participated in meetings of the Organisation for Economic Cooperation and Development (OECD) in Paris, France, providing input on adverse outcome pathways for EDCs. Adverse outcome pathways may be used by international and national regulatory bodies in developing chemical management strategies. Our members were the only endocrinologists participating and played an important role as scientific experts in these deliberations.

The Endocrine Society has a robust advocacy program and our staff continuously advocates on our behalf, but it's not enough for organizations like ours to advocate for science and practice — policy makers want to hear from constituents, too. For areas in which you have an interest or an important stake, I strongly encourage you to lend your voice and participate in advocacy. The Endocrine Society's Advocacy and Public Outreach Core Committee and its Government & Public Affairs Department are dedicated to helping Society members take an active role in advocacy. Contact the Society's government affairs team at govt-prof@endocrine.org for more information and assistance with getting involved.

There are many ways to advocate, ranging from meeting your legislator to attending a campaign event or town hall meeting. The adjacent chart contains examples of how you can become an advocate. ^{EN}

— Henry M. Kronenberg, MD, President,
Endocrine Society



WHY ENDOCRINOLOGY?

A Game of Chance

BY ANGEL NADAL, PHD, Professor of Physiology, CIBERDEM and Institute of Bioengineering, Miguel Hernandez University, Elche (Alicante), Spain

I never planned a career in endocrinology. It has been the result of my interest in basic research and chance. Since very early I was interested in the components of matter and how they react and transform. Chemistry was, therefore, the best election to study a degree. In the 1980s, Bachelor studies in Spain had a duration of five years (they were called “Licenciatura”). The first three years were dedicated to general chemistry and the last two years were specialized in an optative branch. I did enjoy the first three years in the University of Alicante, which had and still has one of the best chemistry faculties in Spain. However, it was tough deciding between physical chemistry or biochemistry and molecular biology for the last two years of my degree; it took me several months of thinking. Finally, I chose the latter, without any special reason for it and moved to Madrid.

During these two years at Autonomous University of Madrid, I was introduced to cell signaling and I was immediately fascinated by the manner that cells talk to each other and the molecular mechanisms used to translate stimuli in responses. When I finished my degree I knew that I wanted to become a basic researcher. So, it was time to find a lab for starting a PhD thesis, preferably in cell signaling. Now, it seems like something easy and straightforward to achieve, yet I remember that then I struggled trying to find an attractive project in a good laboratory and, not less important, a scholarship that allowed me to live during this period.

Then chance played its role. Just after finishing my degree, I assisted with a neuroscience course in Valencia, on the Mediterranean coast of Spain. The course was world-class, plenty of excellent neuroscientists from all over the world, including the Nobel laureate, Prof.

David Hubel. I was impressed by a young professor of physiology at the University of Alicante, Bernat Soria, who gave an outstanding (and relatively understandable for a graduate student) talk about ion channels and insulin release in β -cells. Despite my shyness, after Prof. Soria’s talk, I approached him and asked whether I could work in his lab. A week later he accepted me as a graduate student and I started my career in endocrinology.

Years later, Prof. Soria also helped me to start my own research group. My PhD thesis was centered in how β -cells worked in terms of stimulus-secretion coupling, mostly in how the oscillatory electrical activity induced intracellular calcium oscillations that triggered insulin release. I was extremely fortunate to coincide with Prof. Maiguel Valdeolmillos, a young scientist who was an expert in calcium signaling after being trained by Prof. Garcia-Sancho at the University of Valladolid and Prof. Eisner at University College London. He co-supervised my PhD, and I learned a good deal from him during many hours of calcium and patch-clamp recordings.

“
I am in debt
to chance for
introducing me
to endocrinology
years ago. I hope
it continues
bringing me new
opportunities in
this field in the
years to come.
”

To celebrate 100 years of the Endocrine Society, throughout 2016 *Endocrine News* is running a “Why Endocrinology?” column in each issue. If you’d like to share your story with our readers, contact Mark A. Newman at mnewman@endocrine.org.

I continued working in calcium signaling and its role in cell division during four years of postdoctoral training in the lab of Prof. Peter A. McNaughton in King's College London, UK. Although I did not work in endocrinology at King's, my period in Prof. McNaughton's lab was exciting and productive. Moreover, I learned from him many important aspects that have been key in my scientific career up to now.

By chance, during my last year at King's, I worked with my colleague Miguel A. Valverde, now professor of physiology at Pompeu Fabra University in Barcelona. Miguel was working in rapid responses to steroid hormones and endocrine-disrupting chemicals (EDCs). I will be always grateful to him for familiarizing me with the world of rapid responses to steroid hormones. Since then, I have been working at Miguel Hernandez University of Elche for almost 20 years trying to understand the role of estrogen receptors in the different cell types of the islet of Langerhans.

Soon after starting to work with estrogens, my group described

that low doses of both E2 and Bisphenol-A (BPA) used the same rapidly initiated pathways to trigger important actions in β -cells. This extended my interest beyond islet signaling to the role of EDCs in the etiology of diabetes mellitus. We used BPA as a model of EDC to demonstrate that BPA exposure alters glucose metabolism. Currently, we continue working to understand how EDCs increase the susceptibility to type 2 diabetes after exposure during different periods of life.

My work with EDCs has given me the opportunity not only to participate in the Endocrine Society's meetings but to join the Endocrine Society in some initiatives. I am particularly proud to be one of the co-authors of "EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals," led by Prof. Andrea Gore, which summarized the state of science of endocrine disruptors.

I am in debt to chance for introducing me to endocrinology years ago. I hope it continues bringing me new opportunities in this field in the years to come. 

WHEN YOU NEED THE BEST, **ESAP™ DELIVERS**

NEW!

Train yourself to be the best endocrinologist and deliver outstanding patient care with our premier self-assessment program.

- Completely updated content with 120 new cases
- Online module, hard copy reference book, conventional and SI Units
- Eligible for up to 40 *AMA PRA Category 1 Credits™* and 40 ABIM MOC points

"I use ESAP to refresh my memory on endocrine topics, keep up-to-date with changes in endocrinology, and accumulate CME credits in order to maintain my medical license. ESAP serves this purpose well, and I plan on continuing to purchase it regularly."

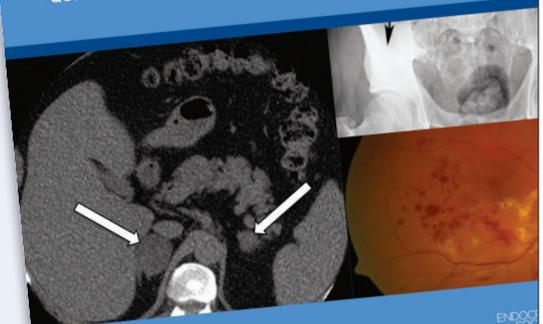
— Roger Rittmaster, MD

ENDOCRINE SOCIETY  1916-2016
100 YEARS
OF HORMONE SCIENCE TO HEALTH

© 2016 ENDOCRINE SOCIETY

**ESAP™
2016**

ENDOCRINE SELF-ASSESSMENT PROGRAM
QUESTIONS, ANSWERS, DISCUSSIONS



ENDOCRINE
SOCIETY
100
YEARS

Krista Kirk Named Chief Human Resources & Talent Management Officer



Krista Kirk, SPHR, SHRM-SCP, joined the Endocrine Society in May in the newly created role of chief human resources and talent management officer. Among many other duties, she will be charged with driving the development of the Society's talent acquisition activities by developing an overall recruitment strategy.

"I am so excited to be a part of an organization with such an important and passionate mission," Kirk says, adding "advancing endocrinology and promoting its essential role in human health."

She comes to the Society with over 20 years' experience in human resources (HR) where she has built the HR function from the ground up with two different organizations. Most recently, she was the vice president of human resources for the Academy of Managed Care Pharmacy where she was charged with integrating the function within the overall business operating strategy.

"We are so pleased Krista has joined our staff," says Society CEO Barbara Byrd Keenan, FASAE, CAE. "Her 20 years of HR and talent management experience will guide our efforts to be a gold standard employer!"

Her role at the Society is to develop a HR strategy to include talent management as the primary focus. The Society's goal is to develop and support its staff so they can excel and continually connect their work to the Society's mission and enhance member value.

Some of her key focus areas are:

- **Onboarding:** Develop a comprehensive and continuous learning environment to immerse newly hired talent in the organization and their position quickly and effectively.
- **Performance Management and Employee Development:** Develop a program to provide employees with frequent and productive feedback to keep focused on consistent continuous learning.
- **Compensation and Rewards:** Build a reward and recognition program (R&R) that is meaningful to employees and will highlight their value to the organization.
- **Culture:** She will be responsible for weaving the Society's core values and culture into every aspect of staff programs and practices.

"To help the Endocrine Society achieve its mission, it's important that we create an environment for staff to be nimble and innovative in order to respond to the ever changing healthcare landscape and produce products and information our members need," Kirk explains. "A few of my objectives are to align individual goals with the organization's strategy, create a highly skilled talent pool by moving toward a coaching model and to facilitate the breakdown of information silos, and develop tools to approach work collaboratively."



ICE-CSE 2016 to Host First Joint Global Symposium on Obesity

When the 17th International Congress of Endocrinology/15th Annual Meeting of the Chinese Society of Endocrinology debuts in Beijing, China at the end of August, it will be the setting for the 1st Joint Global Symposium on Obesity.

This symposium is the first in a regular series of collaborative sessions organized by the International Society of Endocrinology (ISE), European Society of Endocrinology (ESE), and the Endocrine Society. These sessions will feature national, regional, and international thought leaders focusing on global endocrine issues.

This symposium focusing on obesity will have expert speakers who will present their cutting-edge research and discuss the question: "You might think you know, but why do we actually have an obesity epidemic?"

Chairs for the session are ESE president A.J. van der Lely, ISE secretary-treasurer Paul Stewart, and Endocrine Society president Henry Kronenberg.

The symposium takes place on Friday September 2, from 10:15 to 11:45 a.m.

For more information, go to www.ice-cse2016.org.



AMA Calls for Health Coverage for Diabetes Prevention Programs

The American Medical Association (AMA) has officially adopted a policy to encourage private and public health plans to include access to the Centers for Disease Control and Prevention's (CDC) evidenced-based National Diabetes Prevention Program (DPP) as a covered benefit for their beneficiaries.

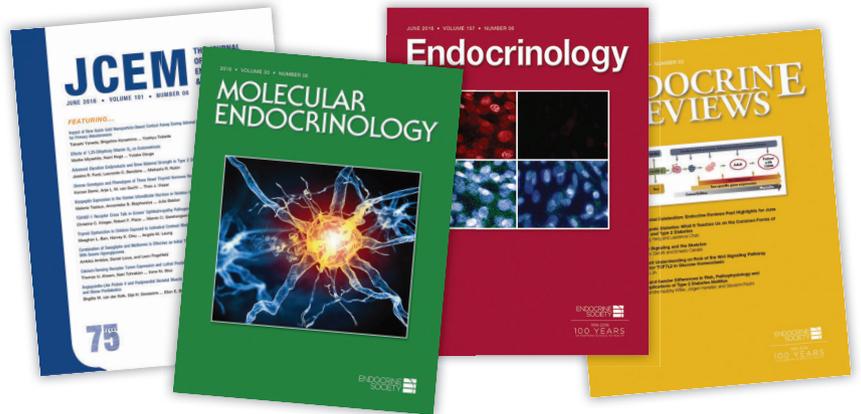
"More than 86 million Americans are currently living with prediabetes and nearly 90% of them are unaware they have it and are at high risk of developing type 2 diabetes. We have a proven way to help these people make necessary lifestyle changes that can help them avoid developing the disease, but health coverage for these programs is limited and varies by location and insurer," said incoming AMA President Andrew W. Gurman, MD, in a statement. "We urge both private and public healthcare payors to offer the diabetes prevention program under their health plans to give more people access to these proven programs."

Additionally, the new policy encourages hospitals to offer the program to their patients and supports allocating community benefit dollars to cover the cost of enrolling patients in an in-person or virtual DPP. Under this policy, the AMA will reach out to organizations such as the American Hospital Association and others to develop and disseminate guidance for covering the costs of the CDC's diabetes prevention program using community benefit dollars.

The new policy adopted today expands on the AMA's ongoing efforts to prevent type 2 diabetes. The AMA has been focusing its efforts over the last two and a half years on increasing awareness of prediabetes and encouraging more physicians to screen their at-risk patients for prediabetes and refer them to CDC-recognized diabetes prevention programs in their communities. Research shows that up to one-third of individuals with prediabetes will develop type 2 diabetes within five years unless they lose weight through healthy eating and increased physical activity.

As part of its efforts to improve the health of the nation, the AMA will continue to support and advocate for policies aimed at reducing the incidence of type 2 diabetes and reducing the fiscal burden associated with the disease.

Endocrine Society Publications Continue to Evolve



The Publications Strategic Plan Initiative (SPI), approved by Council in early 2015, continues to move the Society's journals program forward in a rapid, decisive, and positive way, reflecting best practices from the scientific publishing world and from among association publishers.

The most significant accomplishments to date are:

- Preparing for the 2017 merger of *Endocrinology* and *Molecular Endocrinology*, which leverages their respective strengths and also reflects the publishing industry trend toward larger publishing vehicles for basic research. Co-editor-in-chiefs Andrea C. Gore, PhD, and Stephen R. Hammes, MD, PhD, are bringing expertise, creativity, and energy to this exciting and highly anticipated merger.
- Preparing for the launch of the *Journal of the Endocrine Society (JES)*, the Society's first fully Open Access journal. Led by editor-in-chief J. Larry Jameson, MD, PhD, and a distinguished international team of associate editors. With rapid peer review and continuous online publication, *JES* will publish top-quality research in all areas of basic, translational, and clinical endocrinology, including primary research, clinical practice guidelines, mini-reviews, editorials, and perspectives. Images, case reports, tools and methods, and innovative contributions such as interactive media will also be featured. Timothy Beardsley, DPhil, the journal's executive editor, is working with Jameson to have the journal ready for a fall 2016 launch.
- *The Journal of Clinical Endocrinology & Metabolism* continues to publish top-ranked clinical science. Editor-in-chief R. Paul Robertson, MD, has been working with the Publications staff to fine-tune an already excellent journal.
- For *Endocrine Reviews*, the goal is to further enhance this highly valued resource by providing executive summaries of its articles and more invited reviews. Leonard Wartofsky, MD, MACP, conducts a monthly conference call with his associate editors to discuss upcoming and potential content for this "living textbook."
- The journal *Hormones and Cancer* — which the Society did not own — is reverting back to its owner, Springer Nature, in late 2016 with no further Society involvement. The topics that *Hormones and Cancer* covered will now be included in *JES* under the continuing leadership of Weigel (the journal's editor-in-chief), as one of *JES'* associate editors.

Also, as part of implementing the Publications SPI initiatives, the Publications staff has been aggressively evaluating its vendor and sales agent relationships and upgrading them where needed to meet the increased global opportunities provided by the changes in the publishing program.

Also, the staff has been working to bring the journals into compliance with widely recognized standards and best practices, such as ORCID (Open Researcher and Contributor ID) use for authors (more information at <http://orcid.org/>), adherence to Committee on Publication Ethics (COPE) guidelines for the evaluation of ethical violations, and use of RightsLink to assist readers with securing permission for content use.

Plans for the near future include adding author resources including assistance with promoting published articles, and the Altmetric tool for article-level discoverability and metrics for usage, citation, and impact.

EndoCares Launches in Peru

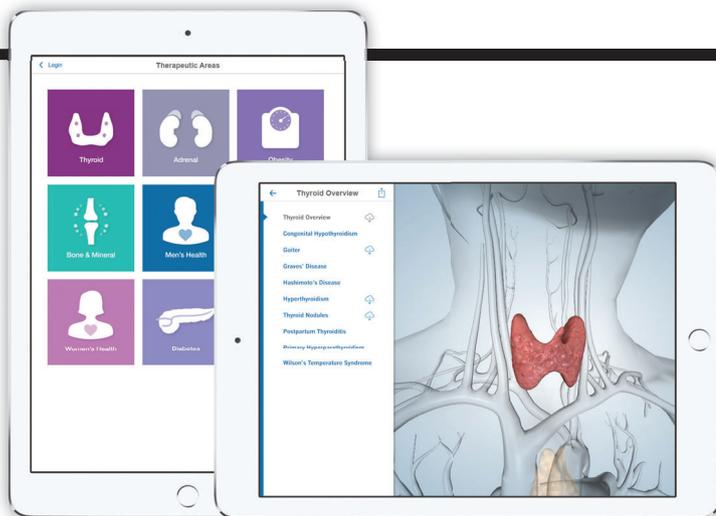
EndoCares, the Society's first international outreach program, will be launched this August in Lima, Peru.

It is being implemented through strategic partnerships with the Peruvian Endocrine Society, Asociacion de Diabetes del Peru (ADIPER), and Liga Peruana de Diabetes. During its pilot year, EndoCares will target two main audiences: patients with diabetes and local healthcare providers in charge of their treatment.

The healthcare provider-focused session will be led by immediate past-president Lisa Fish, MD, on Saturday August 6 during the Peruvian Endocrine Society's annual meeting, which is expected to gather over 1,000 physicians, nurse practitioners, and many more. The patient-focused session will occur on Sunday August 7, and will include a one-day congress for approximately 1,000 patients with type 2 diabetes. There will also be a type 1 diabetes-focused workshop series for approximately 50 to 80 children and adolescents.

With an increase in diabetes cases in Peru, EndoCares will play an important role for raising awareness and strengthening patient and provider education. Our goal is to create a foundation for future iterations of the program and further our relationship with local sister organizations and other stakeholders including government agencies and industry sponsors.

For more information, go to www.endocrine.org/advocacy-and-outreach/endocares.



Journey Through the Endocrine System App Released

The Hormone Health Network (HHN) released Journey through the Endocrine System (Journey) at **ENDO 2016**, the first app of its kind to provide a mobile-friendly application to enhance the understanding of the intricacies of the endocrine system and its related conditions. The goal of the app is to help facilitate better physician-patient communication by arming clinicians with a tool that virtually travels through the glands and organs of the endocrine system.

"We couldn't be happier with the results we are experiencing with the Journey app. It's enabling us to learn more about the areas of interest for our audiences," says Cheretta A. Clerkley, MBA, CASE, CME, director of the Hormone Health Network. "The goal is to continue to expand this application and add new features for the ultimate user experience."

For example, clinicians can share 3D simulations of endocrine-related diseases and disorders with their patients and show how hormones have an effect on the human body. Healthcare professionals will have the ability to dissect, highlight, and show 3D visualizations to patients and direct them to over 100 resources created by HHN. The mobile application is available for iPads and in May the iPhone version was released. We are currently working on the software application for Android devices.

Integrating the Journey into hormone.org has resulted in a 40% increase in traffic to this section of the site where we previously had static images of the male and female endocrine system. To date 318 individuals have downloaded the Journey app and the Journey has been used 553 times. The average time users spend engaging with the app is more than 10 minutes. Since launching at ENDO 2016, 42.5% of users are returning to the app and we are averaging more than 57% of new users engaging with the tool. Our top five topical areas are: Osteoporosis and Bone Health, Diabetes, Children and Teen Health, Thyroid Disorders, and Pituitary Disorders.

Endocrine Society Calls for Integrative Approach to Improve Diabetes Care

To provide integrated care for people who have diabetes and may be at risk of developing related medical complications, the U.S. healthcare system needs to continue building effective multidisciplinary care team models, according to new recommendations issued by the Endocrine Society.

The Endocrine Society's analysis of the challenges and opportunities created by the Affordable Care Act's (ACA) implementation was published online in May in *The Journal of Clinical Endocrinology & Metabolism*, on the sixth anniversary of the ACA being signed into law.

The policy recommendations were developed by physician experts in diabetes as a result of the Society's September 2014 policy summit on diabetes and ACA implementation.

The number of people diagnosed with diabetes is likely to rise as more people gain health insurance coverage through the ACA. One study found a 23% increase in Medicaid patients diagnosed with diabetes in states that adopted the ACA Medicaid expansion, compared to a 0.4% increase in states that did not. About one in four Americans with diabetes is undiagnosed, so expanded access to care is likely to lead to earlier diagnosis and treatment.

"A fundamental challenge in diabetes care is how can we transform multidisciplinary care teams to provide optimal care," said the white paper's lead author, endocrinologist Alvin C. Powers, MD, of Vanderbilt University Medical Center in Nashville, Tenn. "Coordinated care is necessary to ensure the best possible outcomes for people with diabetes. An effective team-based approach must provide comprehensive, continuous and timely care without duplicating any tests or services."

The Endocrine Society's recommendations include the following:

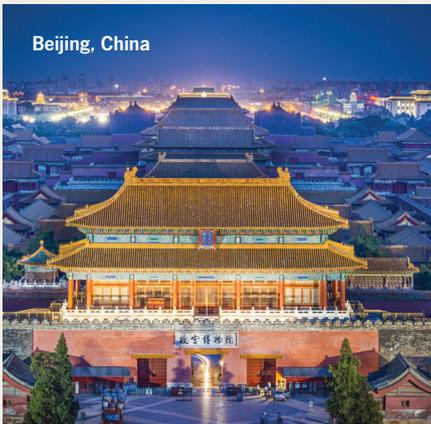


- Prevention and management of diabetes and prediabetes should be better integrated into health systems as well as community and employer-based health programs.
- Reimbursement should be reformed to reward healthcare providers for providing integrated, comprehensive care that complies with industry guidelines for best practices.
- An increase in federal funding and other financial support for research to address gaps in knowledge about diabetes care and promote the development of next-generation treatment options.
- The U.S. Food and Drug Administration and Centers for Medicare and Medicaid Services must accelerate the approval process for new treatments that address unmet needs in diabetes care.
- Conduct ongoing research to monitor how ACA implementation affects diabetes outcomes and care models.

Other authors of the study include: Robert A. Vigersky, MD, of Medtronic Diabetes in Minneapolis, Minn., and the Uniformed Services University of the Health Sciences in Bethesda, Md.; Jason A. Wexler, MD, of MedStar Washington Hospital Center in Washington, D.C.; Robert W. Lash, MD, of the University of Michigan Health System in Ann Arbor, Mich.; and Meredith C. Dyer and Mila N. Becker, JD, of the Endocrine Society.

The white paper, "Affordable Care Act Implementation: Challenges and Opportunities to Impact Patients with Diabetes," is available online at press.endocrine.org/doi/10.1210/jc.2016-1047.

More resources are available through the Hormone Health Network's interactive support tool for people with Type 2 diabetes, their loved ones, caregivers and families called D.A.I.L.Y. (Diabetes Awareness Information for Loved Ones and You). 



Beijing, China

17th International Congress of Endocrinology/15th Annual Meeting of Chinese Society of Endocrinology

Beijing, China, August 31 – September 4

This event furthers the collaboration between ICE and CSE and promotes the long-term commitment to supporting endocrinology

around the world, especially in developing nations. Local and international experts are working together to develop an unmissable program of the highest scientific standards appealing to the full spectrum of endocrinologists around the globe – basic scientists, clinician scientists, practicing endocrinologists, and of course, trainees.

Held jointly with the CSE annual meeting, ICE-CSE 2016 promises to be a rich and fulfilling educational event with the opportunity to learn from experts, colleagues, and peers based around the world in a diverse and colorful environment, unique only to ICE!

www.ise-cse2016.org

Dimensions in Diabetes

Mumbai, India, July 16 – 17

The goal of the program is to foster relationships with endocrinologists around India while providing a clinical update in the field of diabetes. Supported by SunPharma, the two-day program brings in eight faculty members to present in-depth lectures on diabetes and its comorbidities.

www.endocrine.org

Santa Fe Bone Symposium

Santa Fe, August 4

The Santa Fe Bone Symposium is an annual forum devoted to advances in the science and economics of osteoporosis, metabolic bone disease, and assessment of skeletal health. Close interaction and collaboration between faculty and participants is an integral part of this event.

www.nof.org

AADE16

San Diego, August 12 – 15

Each year, thousands of diabetes educators from around the country attend the American Association of Diabetes Educators (AADE) Annual Meeting and Exhibition to learn about the newest and greatest in the world of diabetes through presentations and hands-on experience with products in the exhibit hall.

www.aademeeting.org

Clinical Endocrinology Update 2016

Seattle, September 8 – 10

This three-day meeting provides the latest information available in clinical endocrinology. Taught by expert faculty in a dynamic meeting format, you will return from CEU confident that your endocrine practice benefits from the most current and advanced information possible.

www.endocrine.org/ceu

Endocrine Board Review 2016

Seattle, September 11 – 12

Identify areas for improvement at the most in-depth board preparation available. Fellows preparing to sit for the boards and certified practitioners needing to maintain certification will benefit from EBR, the premier preparatory mock exam.

www.endocrine.org/ebr

86th Annual Meeting of the American Thyroid Association

Denver, September 21 – 25

The ATA meeting is designed for the community of endocrinologists, internists, surgeons, basic scientists, nuclear medicine scientists, pathologists, trainees, nurses, physician assistants, and other healthcare professionals who wish to broaden and update their knowledge of the thyroid gland and its disorders.

www.thyroid.org

EndoBridge 2016

Antalya, Turkey, October 20 – 23

EndoBridge provides a comprehensive update in the field of endocrinology and is specifically designed for the clinical endocrinologist. The official language of the meeting is English, but simultaneous translation will be available in Russian, Arabic, and Turkish.

www.endobridge.org

ObesityWeek 2016

New Orleans, October 31 – November 4

The preeminent annual scientific and educational conference covers the full scope of the obesity issue, from cutting-edge basic science and clinical research to intervention and public policy discussions that can impact the quality of life for millions affected by obesity.

www.obesity.org

PPTOX V

Fukuoka, Japan, November 13 – 16

The international summit of Prenatal Programming and Toxicity (PPTOX) is dedicated to cutting-edge discussion of environmental hazards during early life and long-term consequences. PPTOX is one of the premier international venues for scientists to evaluate current knowledge and guide forward momentum for this burgeoning field.

www.pptoxv.com

ENDO 2017

Orlando, April 1 – 4, 2017

The Endocrine Society holds its annual meeting within arm's reach of the "happiest place on Earth" in Orlando. With over 9,000 attendees, nearly 3,000 abstracts, and over 200 other sessions, it is the leading global meeting on endocrinology research and clinical care. The meeting also hosts other satellite and pre-conference events, such as our Early Career Forum and Hands-On Thyroid Workshops.

www.endocrine.org/endo-2017



Orlando, Florida

“No drug is going to be without risk, and even if you are giving it as a replacement therapy as you do in [growth hormone deficiency], we’re not entirely mimicking the normal physiology of growth hormone secretion and so we have to always be observant and open to the possibility that there may be adverse effects.”

— RON ROSENFELD, MD, professor and chair of Pediatrics (emeritus) at Oregon Health & Science University, Portland, on the associated risks of administering growth hormone to pediatric patients in “Growing Concerns” on page 18.

FROM THE CENTURY OF ENDOCRINOLOGY TIMELINE

1959-1960

Radioimmunoassay Developed



Rosalyn Yalow (Society President, 1978-1979) and Solomon Berson (Society member) developed a technique that uses radioactive materials to investigate the human body for small amounts of substances. In 1959, Yalow and Berson perfected their measurement technique and named it radioimmunoassay (RIA). RIA is extremely sensitive. It can measure one trillionth of a gram of material per milliliter of blood. Due to the small sample required for measurement, RIA quickly became a standard laboratory tool. Yalow later won the 1977 Nobel Prize in Physiology or Medicine for her work.

For more about the Century of Endocrinology, go to: www.ESCentennial.org/timeline.

17% Percentage of children in the U.S. affected by obesity.

— SOURCE: ENDOCRINE FACTS AND FIGURES



SHUTTERSTOCK.COM/CARTOONRESOURCE

41 million children under 5 are overweight

— WHILE ANOTHER —

60 minutes



The amount of exercise the U.S. Department of Health and Human Resources recommends that children and youth should get each day. Most of this activity should be aerobic. Vigorous exercise is recommended at least three days a week, as are muscle- and bone-strengthening activities.

— SOURCE: PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS/HHS

159 million are too undernourished to grow properly

— SOURCE: UNICEF

BY DEREK BAGLEY

Air Pollution Exposure May Raise Heart Disease Risk

Exposure to air pollution can worsen blood sugar levels, cholesterol, and other risk factors for heart disease, particularly in people with diabetes, according to a study recently published in *The Journal of Clinical Endocrinology & Metabolism*.

Researchers led by Victor Novack, MD, PhD, of Soroka University Medical Center and Ben-Gurion University in Beer Sheva, Israel examined the effects of air pollution exposure on 73,117 adults living in southern Israel, where levels of particulate matter can escalate due to its location in the global dust belt, in a population-based, retrospective cohort study. To assess air pollution, the researchers used daily satellite data on how much sunlight was blocked by particles in the air — a measurement called aerosol optical depth. By examining this and other weather data, the scientists developed a model that allowed them to estimate daily air pollution exposure for each study participant using their address.

Researchers analyzed the results of more than 600,000 blood samples taken from the study subjects, who were insured by Clalit Health Services, between 2003 and 2012. All of the study participants were known smokers or were diagnosed with diabetes, ischemic heart disease, hypertension, or dyslipidemia.

The study found participants tended to have higher blood sugar levels and a poorer cholesterol profile when they were exposed to higher average levels of air particulates in the preceding three months compared to those exposed to lower levels of air pollutants. Particulate matter exposure was associated with increases in blood glucose, LDL cholesterol levels, and triglycerides, or fats in the blood. Exposure to particulate matter also was linked to lower levels of HDL, or “good,” cholesterol.

The associations were stronger for people with diabetes. However, those who were taking medications other than insulin to treat diabetes experienced a protective effect. This group experienced smaller changes in blood sugar and cholesterol levels following air pollution exposure.

Findings: Although air pollution did not have an immediate effect on blood test results taken within as little as seven days of exposure, the researchers found that cumulative exposure over the course of three months was tied to risk factors for cardiovascular disease. “We found an association between air pollution exposure in the intermediate term and undesirable changes in cholesterol,” says the study’s first author, Maayan Yitshak Sade, MPH, of Ben-Gurion University and Soroka University Medical Center, both in Beer Sheva, Israel. “This suggests that cumulative exposure to air pollution over the course of a lifetime could lead to elevated risk of cardiovascular disease.”

Lower Spexin Levels Linked to Obesity in Teens



Obese teenagers have lower levels of spexin than their normal-weight counterparts, an imbalance that may make them prone to weight gain, according to a study recently published *The Journal of Clinical Endocrinology & Metabolism*.

Researchers led by Seema Kumar, MD, of the Mayo Clinic in Rochester, Minn., point out that a novel peptide that is implicated in obesity and related energy homeostasis in animals and adult humans. “Little is known about its role in children,” the authors write.

“Our study is the first to look at levels of spexin in the pediatric population,” says Kumar. “Previous research has found reduced levels of this hormone in adults with obesity. Overall, our findings suggest spexin may play a role in weight gain beginning at an early age.”

The cross-sectional study analyzed spexin levels in 51 obese and 18 normal-weight teenagers between the ages of 12 and 18. The participants had blood samples taken between 2008 and 2010 as part of a separate clinical trial. Researchers tested the blood samples to measure spexin levels.

Findings: Researchers divided the teenagers into four groups based on their spexin levels. Among the participants with the lowest levels of spexin, the odds of having obesity were 5.25 times higher than in the group with the highest levels of the hormone. Unlike what has been noted in adults, there was no association between spexin levels and fasting glucose. “It is noteworthy that we see such clear differences in spexin levels between obese and lean adolescents,” Kumar says. “Since this is a cross-sectional study, more research is needed to explore the physiological significance of spexin, how it may be involved in the development of childhood obesity and whether it can be used to treat or manage the condition.”



Bariatric Surgery May Benefit Obese Patients with T1D

Bariatric surgery may benefit obese patients with type 1 diabetes (T1D), by leading not only to significant weight loss, but improvements in insulin requirements and glycemic status, according to a study recently published in *Diabetes Care*.

Researchers led by John P. Kirwan, PhD, and Ali Aminian, MD, both of the Cleveland Clinic, point out that although approximately 50% of patients with T1D are obese or overweight and between 20% and 40% have metabolic syndrome, there “is paucity of data on the impact of bariatric surgery in patients with T1D.” They searched a variety of databases from the time those databases were started until December 2015 and reviewed 17 studies with 107 patients to “quantify the overall effects of bariatric surgery in obese patients with T1D.”

About 65% of these patients had gastric bypass, and they write that all studies reported a significant reduction in excess weight and a significant reduction in daily insulin requirements (except for one study). Common postoperative complications were also reported, as well as some more serious complications such as diabetic ketoacidosis.

Findings: The authors conclude: “The favorable metabolic effects of bariatric surgery may facilitate medical management of and cardiovascular risk reduction in T1D in the setting of severe obesity. Diabetic ketoacidosis and hypoglycemia are potentially serious complications. Short-term results of bariatric surgery in patients with T1D are encouraging, but larger and longer-term studies are needed.”



Exposure to Common Flame Retardant Chemicals May Increase Thyroid Problems in Women

Women with elevated levels of common types of flame retardant chemicals in their blood may be at a higher risk for thyroid disease — and the risk may be significantly higher among post-menopausal women, according to a study recently published in *Environmental Health*.

The study, led by Joseph Allen, MPH, DSc, assistant professor of exposure assessment science at Harvard T.H. Chan School of Public Health, is the first to suggest a link between polybrominated diphenyl ethers (PBDEs) and increased risk of thyroid problems in post-menopausal women in a nationally representative sample of women in the U.S. Thyroid problems include hyperthyroidism, hypothyroidism, goiter, or Hashimoto's disease.

“These chemicals are just about everywhere, from the blood in polar bears to eagles to humans on every continent,” says Allen. “This near ubiquitous exposure means we are all part of a global experiment on the impact of endocrine-disrupting chemicals on our bodies.”

The researchers looked at a nationally representative sample of women involved in the National Health and Nutrition Examination Survey (NHANES). They compared the levels of four common PBDEs in participants' blood samples in 2003-04 with their history of thyroid problems.

Findings*: They found that, overall, women were about five times more likely than men to have a thyroid problem. The percentage ranged from 13% – 16% among women, compared with 2 – 3% among men. Women with the highest flame retardant concentrations in their blood were significantly more likely than those with lower concentrations to have a thyroid problem. The effect size was doubled in post-menopausal women. “To our bodies,” says Allen, “these flame retardant chemicals look and function exactly like endogenous hormones our bodies produce. Should we be surprised that we see downstream health effects for women with higher body burdens of these chemicals? I think no. This is all too predictable and preventable.” ^{EN}

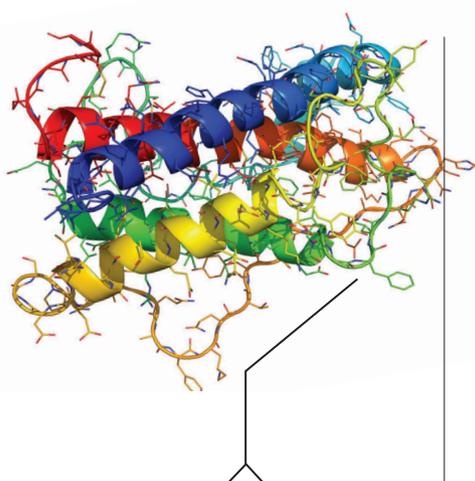
* One limitation of the study is that it couldn't determine effects from newer flame retardant chemicals because they are not currently reported by NHANES.

GROWING concerns

BY DEREK BAGLEY



Ever since a French study linked growth hormone therapy to strokes two years ago, the debate has raged on in the endocrinology community. While most agree that more studies are needed, researchers disagree on how to proceed.



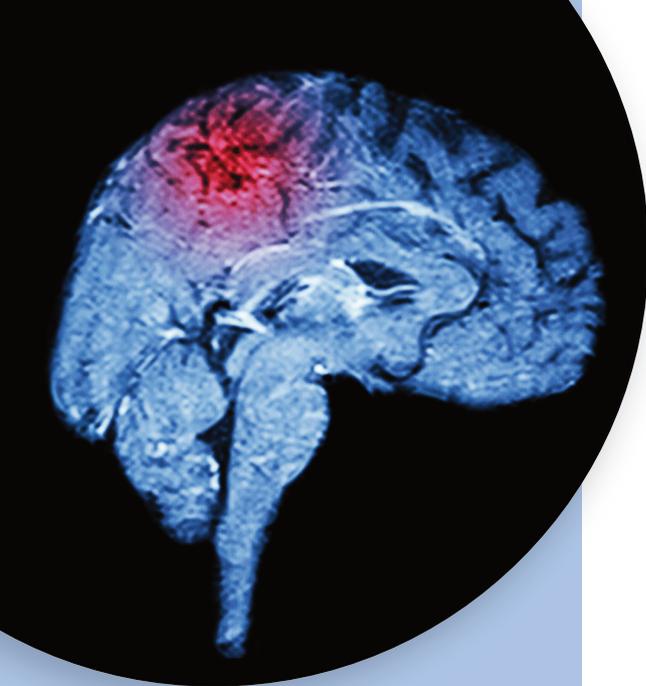
Human growth hormone (hGH) molecule, illustrated wireframe representation. A recombinant form of hGH called somatropin (INN) is used as a prescription drug to treat children's growth disorders and adult growth hormone deficiency.

Two years ago, shockwaves shook the endocrinology science community when a study purported a link between growth hormone (GH) therapy during childhood to stroke risk later in life.

The epicenter from which these shockwaves emanated was the journal *Neurology* when researchers led by Amelie Poidvin, MD, MSc concluded that there was a possible association between GH therapy administered during childhood to “low risk” patients, i.e., those with isolated GH deficiency or idiopathic short stature — or kids who were simply small for their age — and an increased risk of stroke when these patients became young adults. Out of the 6,874 recipients who received GH, 11 had a fatal or non-fatal stroke.

Naturally, this set off some alarms, especially for pediatric endocrinologists who were treating low risk patients with GH, and it prompted a response from the Endocrine Society, which wrote in a statement: “While this raises some concerns, there are several significant limitations to this study identified by experts from the Society, Pediatric Endocrine Society, and Growth Hormone Research Society that necessitate caution in interpreting the conclusions.” The statement goes on to point out several of those limitations, such as data for the cause of death being obtained from French Death Certificates; a lack of adjustment for other risk factors like diabetes, hypertension, and smoking; and the fact that one of the two control cohorts was from another country.

The Society concluded that it “believes that until rigorously performed studies are done which confirm the Poidvin et al’s observations, GH therapy can continue to be safely administered to children who would benefit from it.”



AT A GLANCE

- ▶ **Growth hormone treatment in low risk patients (those without growth hormone deficiency) has been the subject of debate for the last two years, after a French study concluded the treatment is associated with risk of stroke later in life, while the Endocrine Society pointed to limitations in that study.**
- ▶ **The call for “more rigorous studies” could be problematic, since researchers would have to give placebo treatments to many children, among other concerns.**
- ▶ **While there is debate on whether growth hormone treatment is associated with adverse events later in life, most agree more work needs to be done, although there are differing ideas on execution.**

Since then, the debate has continued, even culminating in a session at **ENDO 2016** in Boston, which saw Jean-Claude Carel, MD, head of the Department of Pediatric Endocrinology at Robert Debré Hospital in Paris, France, and a co-author of the *Neurology* paper, make his case that the risks of GH therapy are indeed plausible. Ron Rosenfeld, MD, a professor and chair of Pediatrics (emeritus) at Oregon Health & Science University, Portland, again pointed to the limitations of the French study and echoed the Society’s statement that more studies are needed.

Both researchers, of course, presented their cases well, each bringing up excellent points on the matter and both looking to similar futures for GH therapy and its study, albeit with different ideas of how those futures play out. The debate itself not only underscores the ever-evolving treatment and study of GH therapy, but is also a fascinating example of the nature of science itself.

Growth Spurt

Growth hormone therapy has been around for over 50 years. The use of GH for GH deficiency (GHD) started in the 1950s, when the supply was extracted from human cadaver pituitary glands, but that practice was halted in the 1980s when it was discovered that human GH (hGH) from an actual human body was associated with the devastating Creutzfeldt-Jakob disease, the incurable brain disorder that can lead to dementia, coma, or even death. Fortunately, around this time, recombinant hGH (rhGH) was already in clinical trials, so the FDA moved to expedite its approval to treat children with GHD.

“Over the ensuing 20 years many other pediatric disorders associated with short stature received approval also,” Rosenfeld says. “Although generally speaking the benefit of GH therapy for those disorders isn’t as great as it is with treatment for GHD. In children with GHD, if you make the diagnosis early in life and initiate proper therapy early, you can often restore the child to his or her genetically destined height. But for many other disorders like Turner syndrome or Prader-Willi syndrome or intrauterine growth restriction or idiopathic short stature (ISS), the response to GH may be less robust.”

So the risk/benefit ratios depend on the patient and what disorder is being treated. The benefits and response are greatest for GH therapy in those who have an actual deficiency in GH, but Rosenfeld says that this is even further complicated because it can sometimes be difficult to diagnose GHD. “We can easily diagnose the child with total GHD, but there’s a spectrum and the pharmacological or chemical tests they use to diagnose GHD are imperfect,” he says. “So the borderline between GHD with a robust response and ISS with a more modest response is blurred. So it makes the benefit/risk ratio difficult because the diagnosis is often equivocal. Having said that, I think most endocrinologists take every case at face value and try to do as thorough a diagnostic evaluation as possible and come up with some reasonable estimate

“**Most endocrinologists take every case at face value** and try to do a thorough as diagnostic evaluation as possible and come up with some reasonable estimate of both the benefits and the risks ... [of hGH]therapy.”

— RON ROSENFELD, MD, PEDIATRIC CLINICAL SCIENTIST,
OREGON HEALTH & SCIENCE UNIVERSITY, PORTLAND



of both the benefits and the risks and discuss that with the family as they're trying to determine whether or not they want to go ahead with therapy.”

Another thing to consider with these low-risk patients is exactly how much the GH treatments will add to their height in the long run. Alan D. Rogol, MD, a professor of pediatrics at the University of Virginia in Charlottesville, Va., who moderated the ENDO debate, says that most endocrinologists look for a two-to-three-centimeter increase in growth in the first year. If the patient doesn't reach that, the therapy may be futile. “So the issue is, is it really helpful,” he says. “It's helpful in terms of putting the top of your head taller, but does it make a difference in the kid's quality of life. That's what the real issue is. If I took all the shots and not much happens, is that a success? It's a big biopsy out of someone's wallet, but I'm not so sure that's a success.”

Angela Delaney, MD, a pediatric endocrinologist with the National Institutes of Health in Bethesda, Md., agrees, saying that it would be riskier to not treat a GHD patient with GH, but when it comes to patients with something like ISS, those risk/benefit ratios come into play because that patient is, by definition, not GH deficient. She says that there's a lot to be considered in deciding whether to use GH to treat ISS: what the patient's final height is predicted to be, which is based in part on how delayed their skeletal maturation is as well as their age and their pubertal status; how much longer they have left for growth; and so on.

“So to get an idea of the potential benefit, you have to consider all of those things as well as in other conditions that aren't idiopathic short stature, you have to consider what's the cause of the short stature, what impact will that have on the outcome,” Delaney says. “Then you have to pair that with the risks. The more well established risks include increased intracranial pressure, worsening scoliosis in kids who already have scoliosis due to the rapid growth, and slipped capital femoral epiphysis, which is a surgical emergency. Particularly in non GH-deficient patients there is a risk of increasing hyperglycemia, but that I think is patient population dependent. Then there are the theoretical risks of increased malignancies, as well as these more recent theoretical risks of vascular events.”

Worth the Risk?

And it's these more recent theoretical vascular risks that are the subject of the most recent debates in GH therapy, especially in these low-risk patients. To date, the French study published in *Neurology* is really the only one to reach this conclusion, but Carel says he believes that, while the study did indeed have its limitations, it's the best the scientific community can do at the moment, and the findings shouldn't be dismissed outright.

“My opinion is that we should, first of all, recognize that there is a potential risk and that the findings of the *Neurology* paper are potentially true findings,” Carel says, “and I do



“ How often does someone who got GH treatment for five years when they were a kid mention it to their GP when they’re 50?

There are a lot of limitations even to the long-term surveillance outside of the strict research system.”

— ANGELA DELANEY, MD, PEDIATRIC ENDOCRINOLOGIST, NATIONAL INSTITUTES OF HEALTH, BETHESDA, MD.

think that maybe this is not demonstrated, but to me it is really plausible that there is a link between GH treatment and stroke in these series of patients.”

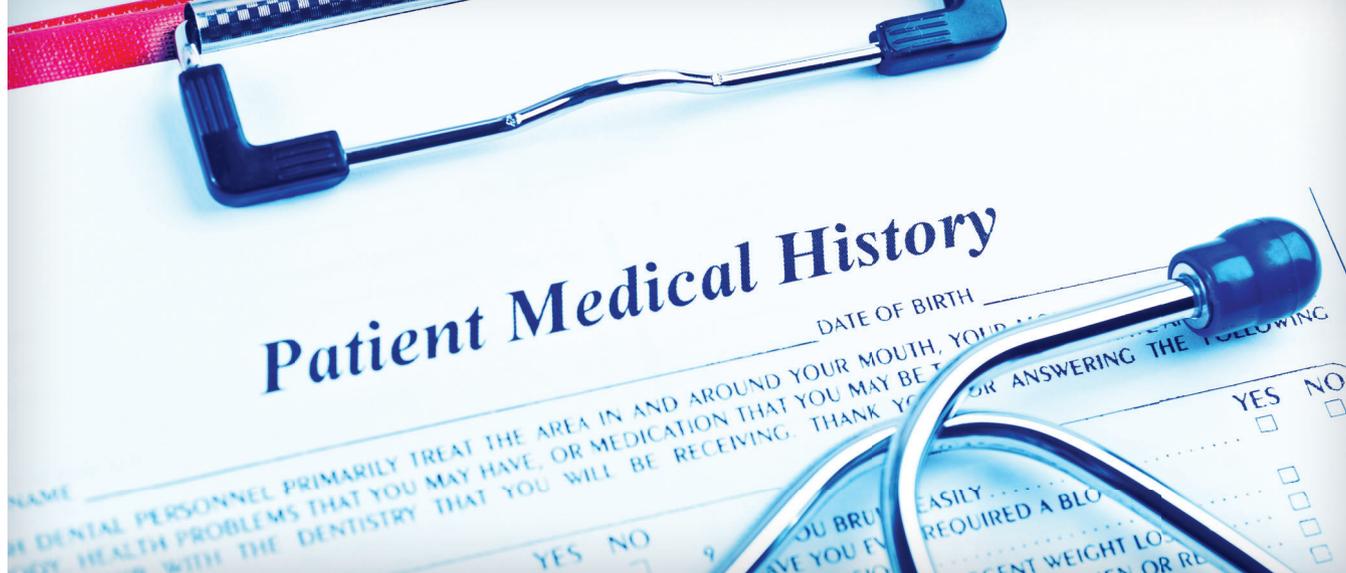
Not surprisingly, Carel disagrees with the Endocrine Society’s assessment because he feels conducting a more rigorous study would be extremely difficult. “We should acknowledge that [the original study’s findings] could be true and keep working on it,” he says, “which is really not what the Endocrine Society’s reaction was ... which, to me, is not appropriate, because I think that a learned society should be open to new information.”

But while Rosenfeld says that the study Carel worked on was an ambitious undertaking and was carefully performed, he points out that so far, no independent investigator has been able to corroborate the findings. In fact, parallel studies that were done in other countries that were part of the SAGhE (Safety and Appropriateness of Growth Hormone Treatments in Europe) study consortium so far have not at all confirmed any of the results that Carel and his team reported. Rosenfeld says that even if the French study turns out to be true, it could be possible that these children or some of these children had underlying conditions that predisposed them to cardiovascular events.

“You can say there’s an association,” Rosenfeld says, “but you can’t necessarily demonstrate causality, and that’s a difficult problem, and it’s a problem that’s almost impossible to tackle, through no fault of any of the investigators because nobody is going to do a controlled study where you take thousands of children who are GH deficient and randomize half to treatment and half to no treatment and follow up for life.”

“[Further studies] would take lots and lots of people,” says Rogol. “They would have to be placebo controlled. So you’re talking about giving someone 365 placebo injections a year. I don’t think it’s practical to really do them properly. The difficulty is not in designing the study; the difficulty is in the execution of the study. It’s going to take a lot of kids who would be getting therapy that may not be so helpful and maybe also include a number of kids getting a placebo for a long time.”

Again, Carel acknowledges the limitations of the French study, but he reiterates that the way he and his team performed the study and interpreted the data is the only option at present. “Going further, I think [we need to] repeat similar studies in other settings, other countries or continents, or find a more rigorous way — to use the word from the Endocrine Society — to do these kinds of studies,” he says. “You say, well I take a bunch of patients. I try to select a rather homogenous population to try to get away from as many confounding factors as I can and follow them over a long term, compared to the general population because that’s my best comparator, and then try to interpret your data, which that’s the way we did and that’s to me the only way right now we can do. Other ways to do this are not realistic.”



For now, the best way for endocrinologists to navigate this with patients is to manage expectations and keep the patients and their families informed of while these studies do exist, they have limitations that haven't been worked out yet. "In talking with families," Delaney says, "knowing that they might get their hands on that information in one way or another, you want to make sure that they understand that you know there's a potential that that's a risk, but there are limitations to the data and you don't really know what to say about it."

"Over the last 25 years, every few years a paper appears citing a cancer risk, Hodgkins disease, colon cancer, whatever," Rosenfeld says. "And none of those studies has ever been corroborated. So there's a period of alarm, then the pendulum swings the other way. No drug is going to be without risk, and even if you are giving it as a replacement therapy as you do in GHD, we're not entirely mimicking the normal physiology of growth hormone secretion and so we have to always be observant and open to the possibility that there may be adverse effects."

Long-Term Surveillance Needed

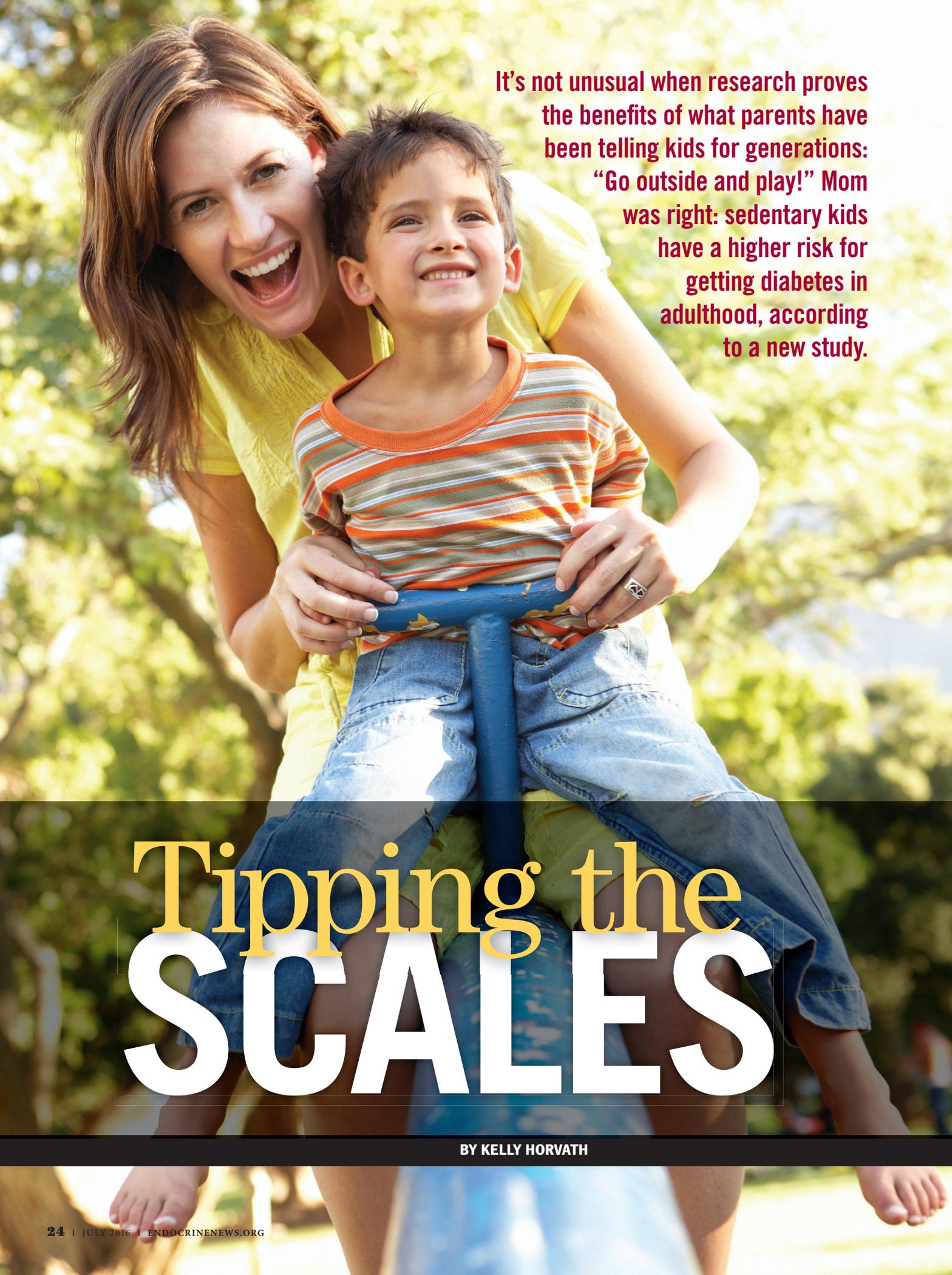
Still, everyone says they see the need and even potential avenues for long-term surveillance of children treated with GH and what possible outcomes and events they may experience in adulthood, and all agree that more information is needed. Carel says that he can see getting closer to proving causality by enrolling larger numbers of patients or even devising animal models to show the effects of GH on the cardiovascular system. "We could enlarge the number of

patients so we can have more information, maybe not on causality but the relationship between the [GH] dose and these events [stroke], which we do not have in that study and are actually difficult to obtain in a small number of patients," he says.

Delaney says that in the absence of more long-term studies, physicians need to continue to be as diligent as they can with reporting to databases. "How often does someone who got GH treatment for five years when they were a kid mention it to their GP when they're 50," she says. "There are a lot of limitations even to the long-term surveillance outside of the strict research system."

Rosenfeld sees opportunity in the rise of long-acting GH treatments, which will not only be more beneficial to the patients themselves — most would rather take a shot every week or four than every day — but also need to be approved by the FDA and European authorities, which will require long-term surveillance. "There will be an opportunity if the endocrine community grabs it to demand that with the approval of long-acting GH, proper lifetime surveillance registries be constructed," he says. "I personally would very much like to see lifetime registries constructed and organized, supported by the FDA, NIH, industry, under independent supervision with a team of people including endocrinologists and statisticians, that can properly address some of the long-term concerns both about benefits and risks, otherwise, you're going to be calling up some other endocrinologist 10 years from now asking the same questions you're asking me." ^{EN}

BAGLEY IS THE ASSOCIATE EDITOR OF *ENDOCRINE NEWS*. HE WRITES ABOUT TRANSITIONAL ENDOCRINOLOGY PATIENTS FALLING THROUGH THE GAP AS THEY PROGRESS FROM PEDIATRIC TO ADULT CARE LATER IN THIS ISSUE.



It's not unusual when research proves the benefits of what parents have been telling kids for generations: "Go outside and play!" Mom was right: sedentary kids have a higher risk for getting diabetes in adulthood, according to a new study.

Tipping the SCALES

BY KELLY HORVATH



According to the Endocrine Society’s 2016 Endocrine Facts and Figures Report, the prevalence of diabetes neared 10% of the total U.S. population, affecting almost 29.1 million individuals, in 2012. Of this number, type 2 diabetes mellitus (T2DM), characterized by chronic hyperglycemia due to insulin resistance, reduced insulin secretion, and increased hepatic glucose production, accounts for 90% – 95% of all cases. Although the parallel prevalence of obesity has well-documented associations with T2DM incidence, and obesity or overweight often accompanies a sedentary lifestyle, a relationship between T2DM in adulthood and physical fitness in youth has been difficult to establish, given the challenges of follow-up.

“ Young people should maintain regular exercise that enhances both aerobic and muscular fitness and **avoid barriers to this, such as screen time.**”

— CASEY CRUMP, MD, PHD, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI HOSPITAL, NEW YORK

Taking Fitness into Account

In a new study, however, researchers from Mount Sinai in New York and Lund University in Sweden, which has a national healthcare system allowing health records to be tracked over a span of decades, compared aerobic capacity and muscle strength at age 18 years with adult diagnosis of T2DM (up to age 62 years). Published in *Annals of Internal Medicine*, “Physical Fitness Among Swedish Military Conscripts and Long-term Risk of Type 2 Diabetes Mellitus: A Cohort Study,” led by Casey Crump, MD, PhD, at the Icahn School of Medicine at Mount Sinai, is the first study of its kind “to examine potential interactions between aerobic and muscular fitness” as well as development of T2DM “even after adjusting for other characteristics such as body mass index (BMI), family history, and socioeconomic factors,” Crump says.

Data from 1,534,425 Swedish men from 1969 to 1997 without prior T2DM revealed that lack of cardiorespiratory capacity and muscle strength, conferred a three-fold higher risk of developing T2DM, resulting in 34,008 (2.2%) T2DM outpatient and inpatient diagnoses at a mean age of 46.8 years from 1987 to 2012 among the cohort. The measurements of aerobic and muscular capacity were taken during a two-day military standardized conscription examination with well-validated tests. A stationary bike was used to obtain



AT A GLANCE

- ▶ **Type 2 diabetes affects 27 million people in the U.S., more than 8% of the U.S. population (and more than 300 million people worldwide), and its prevalence between 1988–1994 and 2005–2010 increased 51.2%, paralleling increases in sedentary lifestyles.**
- ▶ **Lack of either aerobic/ cardiorespiratory or muscular fitness in youth, regardless of body mass index, is associated with type 2 diabetes mellitus diagnosis in adulthood.**
- ▶ **Lack of both aerobic/ cardiorespiratory and muscular fitness in youth, regardless of body mass index, has a synergistic effect and triples the risk for developing type 2 diabetes mellitus in adulthood.**

cardiorespiratory values, and muscle strength was determined from isometric dynamometer tests of maximal knee extension, elbow flexion, and hand grip. “Not only were both low aerobic and muscular fitness linked with a higher long-term risk of diabetes, but this was true even among those with normal BMI,” Crump says. “This suggests that both aerobic and muscular fitness have important long-term health effects, even among people with normal weight. Also, we found that low aerobic and muscular fitness have a synergistic effect on the risk of diabetes (i.e., their combined effect exceeded the sum of their separate effects).”

The researchers posit that better glycemic control in a state of physical fitness, not just maintaining normal weight, helps ward off diabetes. Aerobic activity induces fatty acid oxidation and appropriate response to insulin, while strength straining may contribute to response to insulin by promoting type 2 muscle fiber growth, “fast-twitch” fibers that facilitate glycolysis.

These findings are important both for filling a former gap in the research literature that until now focused on adult (mostly aerobic) activity levels but also for spotlighting a population in need of fitness counseling that may have been thus far neglected. Although normal-weight individuals may once have been presumed to be at lower risk for T2DM, given the relationship between development of the disease with obesity, being out of shape might obviate this presumed lower risk. While genetics is also a major determinant of physical fitness, activity level is the most important modifiable factor, explains Crump. Fortunately, with the inverse association between activity level and T2DM, its flip is also true — that increased activity level decreases risk for T2DM (as well as any number of other conditions). “Prevention of T2DM should begin early in life and include both aerobic fitness and muscular strength, even among persons with normal BMI,” Crump says. “These findings can help inform earlier and more effective lifestyle interventions to reduce the ongoing epidemic of T2DM.”

Physical Activity in Youth Is Key

As study after study has shown, physical activity enhances health in myriad ways, yet less than half of U.S. children and youth meet recommended activity guidelines. “Young people should maintain regular exercise that enhances both aerobic and muscular fitness and avoid barriers to this, such as screen time,” Crump says. In “Physical Activity Guidelines for Americans,” the U.S. Department of Health and Human Services issued recommendations for children and youth to include at least 60 minutes of exercise daily, most of which should be cardiorespiratory/aerobic and of moderate or vigorous intensity (with vigorous-intensity physical activity at least three days a week). In addition, this group should incorporate both muscle-strengthening and bone-strengthening activities on at least three days of the week. Furthermore, these activities should be age-appropriate, enjoyable, and varied to promote sustainability and to establish an active lifestyle as a lifelong habit.

These recommendations might seem quite high, but for good reason, as Crump explains: “Exercise requirements are higher for youth because it’s a period of rapid growth, and more exercise is needed in order for muscles, bones, and the cardiovascular system to grow and develop properly.” According to “Physical Activity in U.S. Youth Aged 12–15 Years, 2012,” from the Centers for Disease Control and Prevention, only 24.8% of youth fully meet these guidelines, 54.8% meet some of them, and 7.6% did not meet them at all. “Specific goals for physical fitness will depend on many factors including age and gender,” Crump says. “The Presidential Youth Fitness Program offers a physical assessment tool that educators can use to track children’s and youth’s progress toward healthy levels of fitness (<http://www.pyfp.org>.)”

Although it was limited to men, the sheer size of this study and its number of participants gives its findings particular weight. “Additional studies are still needed in women and other populations,” Crump says, “but evidence from other studies suggests that the main findings are likely to be similar in these other populations. Other studies are also needed that measure physical fitness as well as diet and BMI at other time points across the lifespan to examine age windows of susceptibility to these factors in relation to diabetes.”

Another caveat with this study is that follow-up measurements of physical fitness and BMI later in adulthood were not available. Again, however, plenty of evidence from other studies suggests that even individuals who were sedentary as youths can decrease risk for T2D or delay its development by adopting an active lifestyle in adulthood.

In the meantime, this study’s implications are crystal clear: Kids need all the opportunities for physical activity they can get to be healthy now and to best maintain health in adulthood. T2DM is undeniably a complex, elusive disease, but increasing physical activity is one component we can control to reduce risk. ^{EN}



“ Exercise requirements are higher for youth because it’s a period of rapid growth, and more exercise is needed in order for muscles, bones, and the cardiovascular system to grow and develop properly.”

— CASEY CRUMP, MD, PHD, ICAHN SCHOOL OF MEDICINE, MOUNT SINAI HOSPITAL, NEW YORK

HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. SHE WROTE ABOUT THE EFFECTS OF WEIGHT AND RACE ON PUBERTY IN BOYS IN THE JUNE ISSUE.



As a pediatric patient transitions to adult care, the challenges can be overwhelming, not just for the patients...but also for the clinician. Maneuvering through this often arduous transition takes skill, compassion, and, most importantly, patience.

MIND

the Gap



BY DEREK BAGLEY

“I FELT LIKE I GOT DROPPED OFF A CLIFF.”

These are the words Carol Greenlee, MD, FACE, FACP, of Western Slope Endocrinology in Grand Junction, Colo., remembers her patient with type 1 diabetes (T1D) saying, describing his transition from pediatric to adult care.

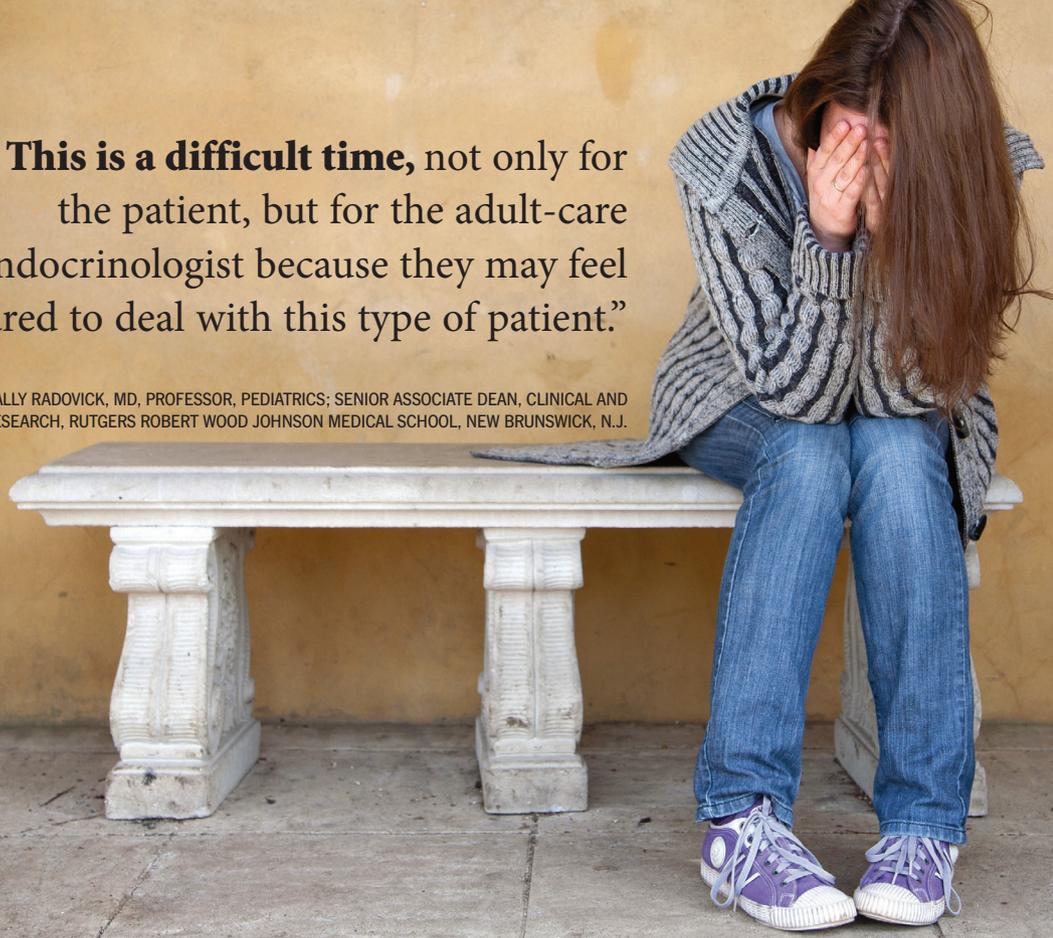
Unfortunately, it's a common sentiment among young adults with chronic conditions originating in childhood as they “age out” of their pediatricians' care unprepared to navigate healthcare as an adult. The fragmentation and silo care of our current healthcare systems contribute to the widening and deepening gaps in care that these young adults encounter. For young adults with T1D, these gaps in care can lead to increased risk for not only early onset of chronic complications but more acute and severe complications such as ketoacidosis and even death.

And this is an age group that is already going through some significant changes: They're moving out of their parents' homes to start college or find a job, often in a new town. “If you look at that age group between 18 and 25, they actually have less healthcare encounters than the age groups before or after them,” Greenlee says, “even though it's a critical time for preventive efforts and care, in addition to their chronic care. If they have a chronic endocrine disease, it's a time when they neglect it more than normal. They develop complications that might not otherwise develop with more continuity in their care.”

“We see people with T1D dying unnecessarily in this age group,” she continues, “just because of this gap.”

“ **This is a difficult time**, not only for the patient, but for the adult-care endocrinologist because they may feel unprepared to deal with this type of patient.”

— SALLY RADOVICK, MD, PROFESSOR, PEDIATRICS; SENIOR ASSOCIATE DEAN, CLINICAL AND TRANSLATIONAL RESEARCH, RUTGERS ROBERT WOOD JOHNSON MEDICAL SCHOOL, NEW BRUNSWICK, N.J.



There are several reasons they neglect their healthcare: A lot of the young adults who are transitioning from a pediatric endocrinology clinic are used to their parents or caregivers taking care of all their medical decisions, so they never learn for themselves how to obtain or use insurance, or even refill a prescription. “They need guidance and assistance,” Greenlee says.

That guidance and assistance must come in the form of communication and collaboration between the pediatric side of an endocrine patient’s care, and the adult-care side when the patient reaches this critical age. As an example of this gap, in a study of 418 survey responses from endocrinologists published in *Diabetes Care*, one of the conclusions was “only one-third of adult endocrinologists reported the opportunity to review pediatric records of young adults entering their practice, although three-quarters felt it was important to do so.” The researchers, led by Katharine Garvey, MD, MPH, of Boston Children’s Hospital, also included several pertinent quotes from the endocrinologists who responded, sentiments which may or may not sound familiar to those reading this story, but more on those later.

When it comes to minding this gap and eventually bridging it, there are many challenges and opportunities, so here we’ll take a look at those, as well as what the Endocrine Society and clinicians working on this problem are doing to help prevent young adults with T1D from feeling like they were dropped off a cliff.

It Takes a Village

Some of the endocrinologists surveyed by Garvey and her team responded by saying, “*I always plan on running behind with this group*” and “*It takes a great deal of time...I wish I had more resources to deal with the transition of adolescents/young adults to the adult endo clinic.*”

This makes sense, because when a young adult who’s in this gap shows up to the endocrinologist’s office, there’s already a feeling of hopelessness, of being lost, shared by both the patient and the doctor. And the endocrinologist knows he or she will have to spend a lot of time talking about things that have little to do with medical care. “I often spend more time on social issues than actual medical decision-making,” writes another survey respondent.



“This is a difficult time, not only for the patient, but for the adult-care endocrinologist,” says Sally Radovick, MD, a professor of pediatrics and senior associate dean for clinical and translational research at Rutgers Robert Wood Johnson Medical School, New Brunswick, N.J. “Because they may feel unprepared to deal with this type of patient.”

And these problems are compounded by the fact that there’s a shortage of endocrinologists, and that shortage is predicted to continue into the near future unless some fairly drastic steps are taken. “The workforce is declining,” Radovick says. “With the workforce shortage, there’s lack of time, very busy practices, and probably inadequate payment for taking on these types of patients.”

But that doesn’t mean there aren’t simple steps that can be taken now, so that the burden of care is lifted from both the patient and his or her endocrinologist. According to Greenlee, the solutions start on the pediatric side of care. Greenlee sees both children and adults in her practice, so she is uniquely positioned in her experience with this. She says that she begins asking her pediatric patients at around age 12 or 14 the tough questions about how they are going to handle diabetes care on their own when they move out of their parents’ homes, in order to determine their grasp of and gaps in their understanding and skills, and whether they truly have a grasp on their disease. “In my appointments, I would do teaching with them: What are ketones? How do you check for them? What do you do if they’re positive?” she says. “So those types of training things need to take place. Clinical staff as well as parents can help with some of that. It doesn’t always have to be the doctor.”

“[As pediatricians] we do a very good job at talking to patients about things like how to use their pen,” Radovick says. “But one of the things we haven’t done, because we haven’t thought about the adult transition, when we start patients, is talk to them and their families about transition. When they’re five years old and starting on growth hormone, we should talk about what’s going to happen when they’re 15. We need to educate ourselves to do that.”

Robert Zimmerman, MD, an adult-care endocrinologist with the Cleveland Clinic has helped children transition into adult care by teaming up with his colleagues. Patients who are ready to be transitioned are referred to him, and once a month he “goes up to the pediatric floor” and holds a combination clinic, during which he works in tandem with the pediatric endocrinologist. “She [the pediatric endocrine nurse practitioner] sees the patient and then I come in and she introduces the patient to me,” Zimmerman says. “Then we go over where the patient is at, and depending on the maturity level of the patient and the ability to get into my schedule determines whether they stay for a while in the pediatric clinic or they just transition straight to the adult clinic.”

AT A GLANCE

- ▶ **Young adults with chronic conditions are vulnerable when it comes to caring for themselves for a variety of reasons: poor self-care knowledge, competing demands for their time, mistrust of their new adult-care clinician, and still-maturing brains.**
- ▶ **It’s up to pediatric endocrinologists and adult-care endocrinologists to help these patients transition, for both the patients’ and the doctors’ sakes.**
- ▶ **Tools have been developed to help with this transition. Visit endocrinetransitions.org to download the Endocrine Society’s Transitions of Care toolkit.**



“ You see this young adult, who’s not as sick as my 74-year-old who’s had an amputation and is on dialysis, but they need a lot of time, and they need a lot of time for psychosocial issues in addition to their management issues. They still need knowledge and skill acquisition.”

— CAROL GREENLEE, MD, FACE, FACP, WESTERN SLOPE ENDOCRINOLOGY, GRAND JUNCTION, COLO.

Radovick says that her clinic holds “peer meetings,” in which patients discuss their diseases, as well as diabetes camps and the like. She sees a future in family-centered medical homes during the transition period, in which nurses, social workers, psychologists, insurance specialists, and so on, all work together to help the adolescent to transition to adult care. “But it’s very difficult in our current health system,” she says.

As Greenlee says, the transitioning to self-care needs to continue taking place on the adult-care side of things, but not every clinician has the luxury of being able to go upstairs to meet with the pediatrician. Ideally, the adult-care practice would receive a transfer summary and/or pertinent medical records from the young adult’s pediatric practice, then the adult-care endocrinologist could review that summary with the patient while inquiring about areas of concern for the patient and areas s/he wants to focus on. The Endocrine Society has developed a toolkit to help with just such a transfer (see SIDEBAR for more information). Referring to the ES self-assessment check list as something reviewed with all patients when they transition from pediatric care “normalizes” questions ranging from comfort with filling prescriptions to dealing with diabetes.

But again, sometimes the actual transfer to another endocrine or primary care practice doesn’t take place when the young adult leaves pediatric care. They might have moved away to a new town or just be unattached to any source of care even in their hometown. Regardless, this lack of regular follow up coupled with their inadequate knowledge and skill set can lead to more than a headache for the adult-care clinician when the patient finally comes in for an appointment. It can also lead to heartache.

At What Cost?

“I find it frustrating at times because they do not realize the potential severity of their disease. They no-show for appointments at much higher rate than other adult patients.” Words from another respondent to Garvey’s survey.

This isn’t hard to imagine. The young adult shows up to a new endocrinologist’s office after a very long relationship with his or her pediatric endocrinologist, and now this new clinician wants to change everything on the first visit, at a time when many other changes are occurring in this patient’s life. “That’s a big change for them, but to change everything that first appointment before they’ve established some trust is a big turnoff to them, and then that frustrates the adult-care clinician,” Greenlee says.

Of course, that isn’t always the scenario, but the patients in this age group no-show or drop out for several reasons. These are young adults with competing

priorities, and a 19-year-old's brain is still developing. Those parts of the brain that haven't matured control executive function, organizational skills, and the understanding of consequences. They also don't respond well to emails or return voicemails, so they may not receive appointment reminders. And when that's the case, Greenlee says it may be time to think about new technology that is attractive to this age group — like social media apps — and to rethink your no-show policy.

“People have said that that's an economic hardship on the adult-care provider,” she says. “It can be. It sure can be. My other patients, if they no-show twice, I'd be charging them a no-show fee or could fire them if they were repeat no-showers. That's a really hard thing to do with this young adult. You want to be teaching them responsibility, but maybe we need a little bit different policy or a little more direct explanation to them.”

But for Greenlee, the bigger financial burden is the time spent with these young adults. Their appointments can take much longer, especially if the clinicians have to help instruct on how to refill a prescription or order supplies. It's more time for the pediatric endocrinologists as well, if they're making sure their child or adolescent patients understand their medications and the management needs of their condition. “You see this young adult, who's not as sick as my 74-year-old who's had an amputation and is on dialysis,” she says, “but they need a lot of time, and they need a lot of time for psychosocial issues in addition to their management issues. They still need knowledge and skill acquisition. So that extra time, I think, is a bigger barrier financially than a no-show or two.”

“What hurts my heart most is the personal cost,” Greenlee says. “I've seen people resurface in their 30s after what I call ‘wandering in the wilderness’ for 10 years. It's amazing how they get insulin.” She says that these patients will go back to R&N insulin because they can get it over the counter. Or she tells the story of how one of her young adult patients figured out he could call the pediatric hospital after hours and get the on-call resident to send in an insulin prescription. The resident would have no idea when this patient's last



Tools for Transitioning

In 2011, Carol Greenlee, MD, put forth to the Endocrine Society a strategic plan initiative to fund a collaborative project to build a toolkit to help clinicians with transitioning patients. “We started with T1D because that's the disease of diseases,” she says.

Transitions of Care, the Endocrine Society's toolkit features several handy forms to help with all kinds of issues on a variety of diseases and disorders, from clinical summaries and patient fact sheets to visitor and transportation information. It can be found at endocrinetransitions.org.

appointment was or how old he was or anything else about him. Another patient convinced his family doctor to prescribe insulin. The doctor apparently wasn't comfortable managing anything else to do with this patient's diabetes, but he would at least give him insulin.

“And then they show up again and they've got protein in their urine, they've got retinopathy, and your heart just sinks and you feel so sad. That causes the cost that I think all of us would like to stop,” Greenlee says.

The first rule in medicine is “Do no harm.” Of course, the point is for doctors to not harm patients, but at some point, that has to extend to doctors not harming doctors. In this instance, it's all about keeping everyone involved informed. Greenlee says that the patients need to acquire knowledge. But if clinicians on both sides could communicate and collaborate, that could help with the information transfer that would save the patients — and the doctors — from being dropped off the proverbial cliff. ^{EN}

BAGLEY IS THE ASSOCIATE EDITOR OF *ENDOCRINE NEWS*. HE WRITES ABOUT THE ONGOING DEBATE ON WHETHER GROWTH HORMONE HAS NEGATIVE EFFECTS LATER IN A PEDIATRIC PATIENT'S LIFE ELSEWHERE IN THIS ISSUE.



YOUNG & Restless

BY MARK A. NEWMAN



A new study shows that there's a link between kids with ADHD and broken bones... but it may not be the link you think it is.

If you've seen a large number of your pediatric patients with casts on their arms or legs and they're known to be...unruly, there could be a connection.

Obviously a child who never sits still is going to be prone to more accidents than the little boy or girl who spends all their time staring dead-eyed into a television screen, video controller in hand, or the quiet child who spends time writing stories and drawing pictures. However, just because these active youths are putting themselves in harm's way more than the calmer kids may not be the only link to the cast on their arms; the medication they're taking may be the real culprit, or at least a coconspirator.

A new study presented at ENDO 2016 in Boston in April showed that children who are taking drugs to treat attention-deficit hyperactivity disorder (ADHD) may actually have lower bone density than their peers who don't take these medications. According to the study's lead investigator Alexis Feuer, MD, assistant professor of pediatrics and a pediatric endocrinologist at Weill Cornell Medicine in New York, she was not entirely surprised by her study's results since it was her original hypothesis that stimulant medications would adversely affect bone density.



“All healthcare providers caring for children on stimulants should start screening their patients for bone health as soon as possible.”

— ALEXIS FEUER, MD, ASSISTANT PROFESSOR OF PEDIATRICS;
PEDIATRIC ENDOCRINOLOGIST, WEILL CORNELL MEDICINE, NEW YORK, N.Y.

“There is a very clear molecular mechanism by which this would occur,” she explains. “I was pleased with our results as they support animal data which reveal that activation of beta-adrenergic signaling pathways — the signaling pathway through which stimulants exert their effects — leads to decreased bone mass.”

The medications — methylphenidate (Ritalin, et al.) and amphetamine — are often used to treat ADHD, which, according to the Centers for Disease Control and Prevention (CDC), affects more than 6 million children in the U.S.

“INCREASED LIFETIME RISK”

While past studies have shown that stimulants could slow a child’s growth rate in terms of height, the effect of the meds on bone health has remained unclear, according to Feuer, who says that adolescence and young adulthood are critically important times for accruing peak bone mass, i.e., the largest and densest bone. “Failure to accrue peak bone density by early adulthood puts an individual at an increased lifetime risk of osteoporosis and fractures,” she says.

Feuer and her team studied the association between these stimulant medications and bone density using data from the National Health and Nutrition Examination Survey (NHANES), a series of surveys from the CDC that assesses American health. Among 6,489 subjects aged 8 to 20 years who participated in NHANES between 2005 and 2010 and had a bone density scan using dual-energy X-ray absorptiometry (DXA), only 159 used stimulants.

The DXA scans evaluated bone mineral density — a surrogate measurement of bone strength — as well as bone mineral content (bone weight) at both the hip and the lumbar spine. According to Feuer, interpreting bone density results in growing children can be challenging since the child’s height has to be taken into consideration.

She explains that the bone density results obtained from a DXA scan are areal measurements, so the DXA will measure height and width of the bone, but not thickness. Therefore, if two children have the exact same volumetric bone density (height, width, and thickness), the shorter child will appear to have a lower measured BMD than the taller child. Additional factors must also be taken into consideration — for example, commonly scanned anatomic sites such as the hip are not preferred for children because of difficulty with proper positioning due to lack of bony landmarks for orientation.

“Pubertal development also leads to increases in bone density, so if a child has delayed puberty they will also appear to have a lower bone density than peers their age who are already in puberty,” she says. “Pediatric DXA scans should therefore be interpreted by radiologists and/or endocrinologists with experience in pediatric DXA.”

STUDY RESULTS

In the study, in the kids who were taking stimulants, the average bone mineral content at the lumbar spine was 5.1% lower than in nonusers, and 5.3% lower at the hip, according to the investigators. Bone density was 3.9% lower in stimulant users at the spine and 3.7% lower at the hip than nonusers.

So do the study's findings mean that children on ADHD medication are more likely to develop osteopenia or osteoporosis?

"That's the question we must answer," Feuer says. "Right now, from this study, we have only an association between stimulant use and lower bone density. The study was cross-sectional in design, so we cannot infer any type of cause and effect from it. We need to perform prospective studies to decipher if stimulant use actually does lower bone density in children and what future effects this may have."

Feuer says "it would be reasonable to conclude that if a prospective study reveals that stimulant use does in fact lead to low bone density in children and prevents them from obtaining peak bone mass that they would also likely be at increased risk for fractures and osteoporosis."

HANDLE WITH CARE

Feuer says that children taking stimulant medications should have regular screening for bone health, which would entail checking vitamin D levels and giving them supplements if the levels are insufficient. "They should have their height and weight assessed at regular intervals to ensure they are growing appropriately," she explains, adding "they should have dietary calcium intake assessed and again supplemented if needed and they should be getting an hour of weight-bearing exercise daily." However, bone density scans, or DXA scans, are not recommended for screening purposes at this time, she says.

Having children participate in weight-bearing exercise will help with building strong bones so Feuer says that children should get about 60 minutes of this type of exercise daily. "It is also important to monitor for appropriate linear growth, weight gain, and appropriate pubertal development," she adds.

Moving forward, Feuer feels that since the number of children, adolescents, and young adults taking stimulant medications for the long term is high — and continues to increase annually — there must be more prospective studies to assess the medications' effects on bone density. "Additionally," she adds, "all healthcare providers caring for children on stimulants should start screening their patients for bone health as soon as possible." ^{EN}



AT A GLANCE

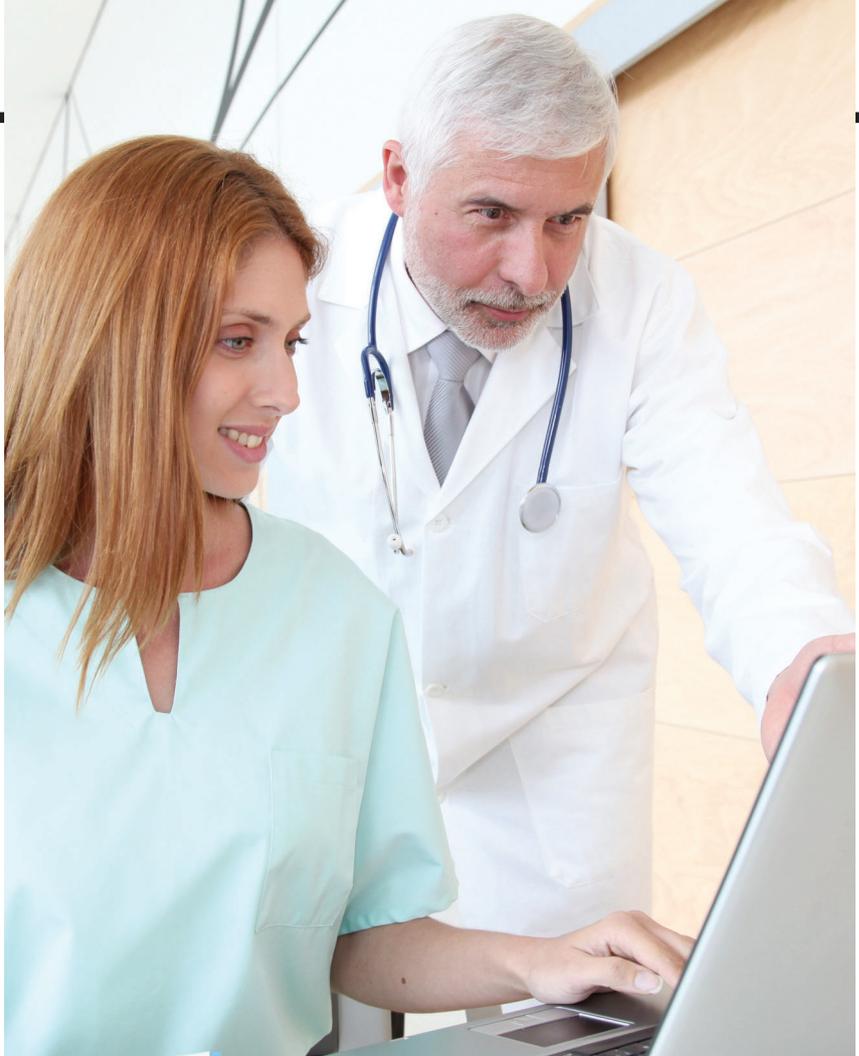
- ▶ In the U.S., attention deficit hyperactivity disorder (ADHD) affects more than 6 million children, according to the Centers for Disease Control and Prevention.
- ▶ Stimulant medications — methylphenidate (Ritalin, et al.) and amphetamine — are often used to treat ADHD.
- ▶ Children on ADHD medications were found to have lower bone density than their counterparts who were not on these stimulants. However, more studies are needed in order to prove whether there is a definite link.

NEWMAN IS THE EDITOR OF *ENDOCRINE NEWS*. HE WROTE ABOUT THE MALE BIRTH CONTROL PILL IN THE JUNE ISSUE.

The Learning Curve

The Endocrine Society introduces the Fellows Training Series, a new educational series that benefits both clinical trainees and program directors.

BY KELLY HORVATH



As any practicing physician knows, just because you've received your MD and start treating patients, the learning never stops. Continuing education is an ongoing process that lasts throughout a clinician's career.

The Endocrine Society is renowned for long supporting clinical fellowship training programs and early career development with helpful resources, most notably the annual Endocrine Self-Assessment Program (ESAP) In-Training Exam (ESAP-ITE).

Now, in collaboration with the Association of Program Directors in Endocrinology, Diabetes and Metabolism (APDEM), the Society is offering a brand-new suite of online content called the Fellows Training Series (FTS) designed specifically to meet the needs of both program directors and their trainees.

Debuting this month to be in place for the upcoming academic year, the FTS will cover all endocrine conditions and disorders. This platform is both robust and dynamic — modules will be developed on an ongoing basis and continuously added to grow the series and keep content fresh and based on the most current evidence. The FTS is also readily scalable —

additional resources can be developed and added as and where needed.

"The Fellows Training Series is an exciting new program that provides flexible, high-quality content to support physician training," says Endocrine Society CEO Barbara Byrd Keenan, FASAE, CAE. "We are pleased to collaborate with APDEM on the FTS, which supports both fellows and trainees in this unique training program."

Developed under the guidance of the Society's Clinical Endocrine Education Committee (CEEC) in partnership with APDEM, the FTS is a package of discrete modules that expands on APDEM's current endocrine fellowship-training curriculum and is accessed through an online education portal.

"The FTS will continue to provide the ESAP-ITE, but is expanding the educational resources provided by the Society," says Whitney Goldner, MD, associate professor, Internal Medicine Division of Diabetes, Endocrine & Metabolism at the University of Nebraska Medical Center in Omaha and CEEC chair. "It's a great opportunity for both fellows and program

directors.” With the advent of the FTS, expanded teaching and study resources are also now available that provide a richer review and assessment experience.

By signing up for an institutional subscription for their training program, instructors can access supplemental content that allows them to create slide sets and assignments as well as have assessment opportunities to monitor their fellows’ progress. Fellows can log in at their own convenience to complete their work on their own time and at their own pace, enhancing knowledge and honing skills to become excellent physicians committed to patient care.

What FTS Offers

Fellows will still have the ability to self-test with ESAP-ITE in multiple ways, either by focusing on specific topical modules or by encompassing all areas of endocrinology, diabetes, and metabolism. But, in addition to the clinical vignette-style questions, fellows also now have access to helpful answer discussions that provide an additional active review method. They will be able to identify learning gaps and errors as well as learn how to address and remediate these areas. Furthermore, they can avail themselves of the references and resources used to create the clinical vignettes for an even fuller experience. Re-testing is also readily available to measure improvement or just for additional practice testing.

Other new enrichment components will allow a program director to assess a fellow’s competency in three endocrine procedures required for American Board of Internal Medicine (ABIM) Initial Certification. Case-based modules for interpretation of thyroid ultrasounds, continuous glucose monitoring systems (CGMS), and dual energy x-ray absorptiometry (DEXA) scans will also be part of the FTS. “These modules will provide an objective way for program directors to assess interpretation of these procedures while also providing fellows additional educational tools,” Goldner says.

A Revolutionary Physician-Training Program

“APDEM in collaboration with the Endocrine Society has been able to update and enhance the endocrine curriculum to better reflect Accreditation Council for Graduate Medical Education (ACGME) milestones and the ABIM certification process,” says Geetha Gopalakrishnan, MD, Brown University, Providence, R.I., and incoming president of APDEM. “Medical knowledge, professionalism, and quality are curricular areas we plan to strengthen in the upcoming year. Our goal is to help educators enhance their teaching and evaluation process. The Endocrine Society has been a great partner in this endeavor.”

APDEM and the Society have collaborated to ensure that core endocrine content is available to the fellowship training community through the FTS that will attain the highest standards in physician training and promote excellent patient care, including access to endocrinology’s leaders, professional development opportunities, and competency-based training, such as the Accreditation Council for Graduate Medical Education (ACGME)’s “Pathways to Excellence” priorities.

For more information on how to provide your fellows with the highest-quality physician training, please go to education.endocrine.org/FTS. 

HOW TO ACCESS THE FTS

Hosted on the Endocrine Society Center for Learning website (education.endocrine.org), access to the FTS is available as an annual institutional subscription, and two subscription levels are available to choose from, beginning in summer 2016. Whether subscribing at the basic or premium level, content will be available to all fellows, program directors, and program coordinators.

The FTS basic subscription includes access to the ESAP-ITE as well as new features such as reports on individual and group performance and the three procedural assessment tools (thyroid ultrasound, CGMS, and DEXA scanning).

The FTS premium subscription includes access to all activities in the basic subscription plus these additional educational tools:

- ▶ Additional ESAP-ITE learning materials
- ▶ Extensive library of pituitary and adrenal imaging
- ▶ Clinical Practice Guidelines
- ▶ Endocrine Fellows Conference workshops (e.g., Osteoporosis and Metabolic Bone Disease, Type 1 Diabetes Care and Management, and Pituitary)

Annual subscription fees are based on program size. Early subscription pricing expires after September 30th. Basic - \$125/fellow; Premium - \$200/fellow

HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. SHE WROTE ABOUT THE CONNECTION BETWEEN LACK OF EXERCISE IN CHILDHOOD AND T2D AS AN ADULT EARLIER IN THIS ISSUE.

Senate Boosts NIH Funding by \$2 Billion

On June 9, the Senate Appropriations Committee approved the fiscal year (FY) 2017 Labor, Health and Human Services (LHHS) Appropriations bill by a vote of 29-1 (James Lankford [R-OK] was the only “no” vote). The bill provides a \$2 billion increase for the National Institutes of Health (NIH), bringing the agency's budget to \$34.1 billion in FY 2017.

This is a major victory that came about because we advocated for an NIH funding increase. We visited many congressional offices, including during our Centennial Hill Day in April, submitted testimony, and wrote letters and emails to Congress.

All of the Senators who attended the mark-up offered strong praise for LHHS Subcommittee Chairman Roy Blunt (R-MO) and ranking member Patty Murray (D-WA) for producing a bipartisan bill despite the subcommittee receiving a lower total allocation than last year. Several committee members, including Senators Barbara Mikulski (D-MD), Richard Durbin (D-IL), and Susan Collins (R-ME) mentioned the significant increase for NIH as a highlight of the bill.

The Senate bill would mark the second year in a row that the NIH receives a \$2 billion funding boost. Last year, the agency received its largest budget increase in 12 years. However, the outlook for NIH funding is not certain. We do not yet know if Senate leadership will bring the Appropriations Committee-approved LHHS bill to the Senate floor for a final vote. The House LHHS Appropriations subcommittee has not yet voted on its version of the funding bill, and with limited legislative



days left in the congressional session before the elections, many expect the Congress will be unable to complete action on funding bills and will instead resort to passing a Continuing Resolution that funds the government at this year's levels.

The funding bill is accompanied by a report in which the Appropriations Committee directs the federal agencies to do certain things. This year we recommended report language in three areas that were accepted and included in the Senate report. This included: encouraging Medicare to modernize its policies to cover continuous glucose monitors; urging Medicare to improve outpatient evaluation and management work performed by cognitive physicians; and calling on NIH to implement the recommendations of the Physician-Scientist Workforce Working Group. Report language does not have the weight of statute, but it does set specific policy directions and holds the agencies accountable. This language will help support our advocacy regarding Medicare coverage, Medicare physician payment, and workforce issues.

TAKE ACTION: It is critical that all members of Congress hear from their constituents about the need to provide a funding increase for NIH.

Join the Endocrine Society's advocacy efforts by participating in our online campaign. All you need to do is visit our online advocacy center at www.endocrine.org/advocacy, submit your zip code, and our system will send letters to your representative and senators.

AMA Approves Society-Supported Policies at Annual Meeting

The American Medical Association (AMA) recently held its annual meeting of the House of Delegates (HOD), which is the policy-making body of the AMA.

The Society's delegates – Amanda Bell, MD, Daniel Spratt, MD, and Palak Choksi, MD – represented the interests of endocrinologists in the debates surrounding issues that impact the practice of medicine. Discussion of new AMA policy focused on a range of issues relevant to endocrinologists, including care of transgender patients, assignment of gender at birth for patients with ambiguous genitalia, expansion of the National Diabetes Prevention Program, and a reduction in corn subsidies for the production of high fructose corn syrup. The HOD also voted to expand existing policy on gun control to establish that gun violence is a public health crisis. As a result, the AMA will actively lobby Congress to overturn the ban on research on gun violence by the Centers for Disease Control and Prevention.

The Endocrine Society's delegates also worked closely with the delegates from the American Association of Clinical Endocrinologists, American Society for Reproductive Medicine, and American Association of Endocrine Surgeons during the meeting on issues of importance to endocrinologists, and met with members of the Obesity Caucus to discuss issues related to care of patients with obesity and provider education.



NIDDK and NICHD Advisory Councils Discuss Global Health, Institute Priorities

On May 18, the Endocrine Society attended the 201st meeting of the National Diabetes and Digestive and Kidney Diseases (NIDDK) Advisory Council. Society members Lee Kaplan, MD, PhD, Alan Saltiel, PhD, and Joel Elmquist, PhD, DVM, are members of the NIDDK Council, which advises the director of the NIDDK on research, support activities, and functions of the Institute.

During the open session of the meeting, the director of the Fogarty International Center (FIC), Roger Glass, MD, PhD, joined the Council to provide an update on the activities of the FIC. Glass discussed how global research priorities often end up impacting domestic treatments, and highlighted the success of international training and research programs for young investigators. He also noted that diabetes and other endocrine diseases rank among the most compelling around the world. For example, the prevalence of diabetes is increasing tremendously in southeast Asia as age structures and average body weights are changing rapidly. He predicted that the fastest growth in diabetes will be in the African continent over the next 20 years.

The NIH Deputy Director for Extramural Research, Michael Lauer, MD, then gave a presentation “Evidence-Based Funding: Thoughts About Extramural Research,” which examined how research is currently evaluated and supported in an era where the U.S.’s research budget as a percentage of gross domestic product (GDP) is decreasing. He noted that there is currently no “gold standard” for assessing value in biomedical research, and that publication records are not a perfect metric because different fields cite papers at different rates. Council then discussed how to understand all the components and parties that contribute to drug development, and how to evaluate projects in light of the unpredictable nature of biomedical research.

During the open session of the Diabetes, Endocrinology, and Metabolism Subcouncil, Endocrine Society member and NIDDK program director Corinne Silva, PhD, delivered an update on large, interdisciplinary team-science projects where she described how applications using the R24 grant mechanism would be transitioned to an RC2 mechanism and highlighted some specifics for the RC2 mechanisms, including expected budgets larger than \$500,000 per year; opportunity for two submission dates per year; pre-approval process through NIDDK divisions; and a two-level editorial board type review.

On June 9, the Endocrine Society participated in the 160th meeting of the National Advisory Child Health and Human Development Council. During the open session of the meeting, Vesna Kutlesic, PhD, the director of the NICHD Office of Global Health, joined the council to provide an overview of NICHD programs to advance global maternal and child health. NICHD’s total international funding related to global health research includes 286 funded projects in 138 countries totaling over \$115 million. Kutlesic described several recent advances from these projects, including a study in South Africa on the evolution of antibiotic resistance in *Mycobacterium tuberculosis*, and also a study in Denmark on the determinants and health implications of diabetes in pregnancy on women and their children.

European Commission's Overreaching Decision Fails to Protect Public Health



SKYFISH / SHUTTERSTOCK.COM

The Endocrine Society expressed disappointment and concern with the European Commission's July 15 decision on regulatory criteria for endocrine-disrupting chemicals (EDCs), saying it is too strict to effectively protect the public's health.

"The European Commission has set the bar so high that it will be challenging for chemicals to meet the standard, even when there is scientific evidence of harm," says Society president Henry M. Kronenberg, MD. "To protect pregnant women, children, and future generations from chemicals of concern, we need science-based regulation that reflects the growing body of evidence documenting this public health threat."

More than 1,300 studies have tied EDC exposure to health problems such as infertility, diabetes, obesity, hormone-related cancers, and neurological disorders, according to the Endocrine Society's 2015 Scientific Statement. Because the health effects of exposure can take years or even generations to become apparent, scientists have used a variety of animal and epidemiological studies to document the effects of EDCs.

Two days before the European Commission announced its criteria, Endocrine Society members called on the European Commission to adopt science-based policies for regulating EDCs in an opinion piece published in *The Lancet Diabetes & Endocrinology*.

"A growing body of research has found endocrine-disrupting chemicals pose a threat not only to those who are directly exposed, but to their children, grandchildren, and great-grandchildren," says the Society's European Union Endocrine-Disrupting Chemicals Task Force Co-Chair Jean-Pierre Bourguignon, MD, PhD, first author of the opinion

piece, of the University of Liège in Liège, Belgium. "We need to protect the public and future generations with regulations that address the latest scientific findings and incorporate new information from emerging research."

The European Commission had proposed four options for regulatory criteria identifying EDCs. The Endocrine Society supported option 3, which would create multiple categories based on the amount of scientific evidence that a particular chemical acts as an endocrine disruptor. This option also allows for incorporating new data as more studies are published. Ultimately, however, the Commission selected a restrictive version of option 2.

The European Commission's overly strict criteria would result in very few EDCs being identified and regulated, at a high cost to the public's health. Recent studies have found that adverse health effects from EDC exposure cost the European Union more than €163 billion each year in healthcare expenses and lost productivity. Bisphenol A and other EDCs can be found in common products, including food containers, plastics, cosmetics, and pesticides.

The European Parliament and member countries still need to approve the regulatory criteria before they take effect. The Society will continue to advocate for changes to ensure the criteria are grounded in scientific evidence.

"The Society is disappointed that the Commission disregarded scientific evidence in its decision, but our member experts are prepared to advise policymakers on what criteria are needed to effectively identify endocrine-disrupting chemicals," Kronenberg says. "We want to work together to ensure the final result of the regulatory process will protect the public's health." 



BARIATRIC SURGERY AND ADOLESCENTS

Meet Eric. Eric is one of 12.5 million children between the ages of 2 and 19 who are overweight. That number is growing every year.



Overweight and obese children are at greater risk for getting serious health conditions, including:



diabetes



heart conditions



high blood pressure



high cholesterol

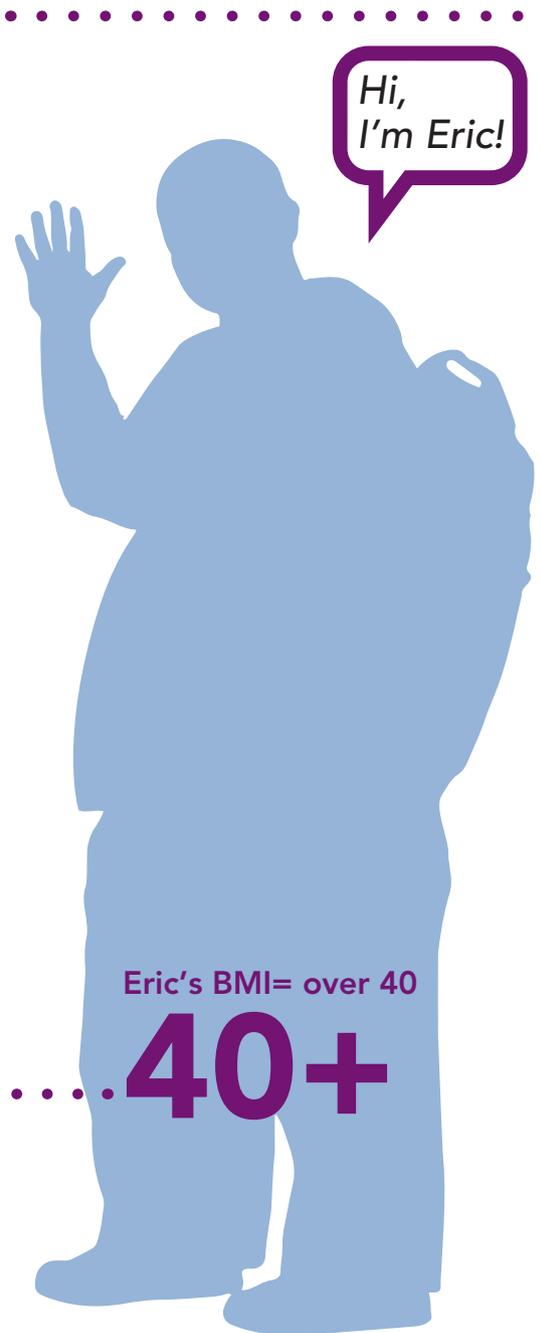
Eric and his family have been eating a healthier diet and getting more physical activity into their daily routine. But Eric's body mass index (BMI), a measure of a person's weight as compared to a person's height, is over 40, in spite of everything he's done.

BMI Categories:



Eric's BMI= over 40

40+



Bariatric surgery can help get weight down to a healthier level.

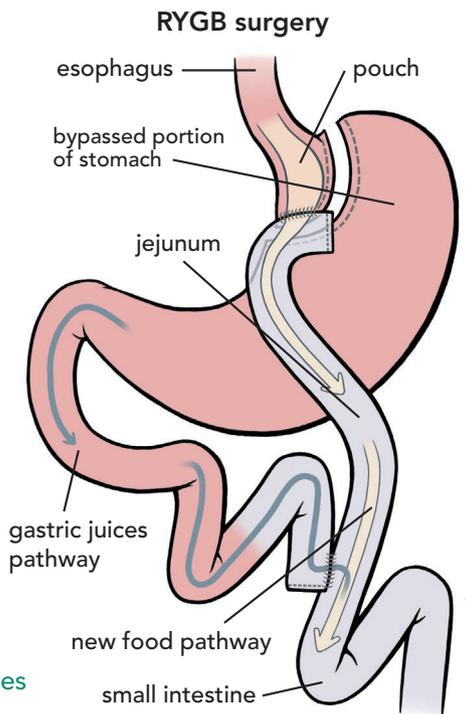
- It is an option when adolescents reach what is sometimes called "skeletal maturity"—about the age of 13 for girls and 15 for boys.
- Eric's doctor tells Eric and his family that while bariatric surgery is a good idea for Eric, it's only one step in the process to getting to a healthier weight.
- Bariatric surgery is not a magic bullet. Eric will have to change the way he eats and keep getting plenty of physical activity, among other changes he may have to make.



There are two types of bariatric surgery that are performed on young people:

	Roux-en-y gastric bypass (RYGB) surgery	Adjustable gastric band (AGB) surgery
Description	Staples or plastic band are used to create a small pouch at the top of the stomach. The new smaller stomach is connected directly to the small intestine.	Adjustable silicone band is placed around the top of the stomach, creating a small pouch that holds much less food. When the pouch is filled with food, feelings of hunger go away.
Pros	Most frequently performed type of bariatric surgery in teens (80% of cases). Has been performed for many years and has a high success rate.	Lower rate of complications. Faster recovery time. Vitamin deficiencies are rare because the intestine is not affected.
Cons	Involves cutting through the intestine, so it has a longer recovery time than AGB surgery. Cannot be reversed.	May not take off as much weight initially as RYGB surgery. May require replacement surgery at a later date.
Possible side effects	Bleeding; anesthesia reactions; infections at the incision points; blood clot in the lung; bowel obstructions; "leaky" stomach or abdominal area, possibly leading to infection	Bleeding; infection; slippage of the band; erosion of the band into inside of stomach; spontaneous deflation of band due to leakage; enlargement of stomach pouch; blockage of the stoma (stomach outlet)

Eric's new, smaller stomach is able to hold much less food than his "old" stomach could. It may only hold 1 cup of food at a time, as opposed to as much as 8 cups in the old stomach.



After Eric recovers and returns home, he:

- Will eat **many smaller, low-calorie, low-fat, high-protein meals** throughout the day, **eat more slowly**, and **avoid high-fat and high-sugar foods**.
- May have **side effects** from the surgery, such as pain in his stomach area, diarrhea, vomiting, or acid reflux (heartburn).
- May experience what is called "**dumping syndrome**," which happens when the food moves too quickly through his digestive system.
- Will need to **take vitamin and mineral supplements**. By eating smaller amounts of food, Eric may not get all the nutrients he needs.

Today, Eric's weight is in a much healthier range. He's sticking to his new diet and getting more physical activity into his daily routine.

He's feeling better than ever, and he's happy that his risk for diabetes and serious heart problems has gotten much lower than it was.



Patients 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.

UNIVERSITY of MISSOURI



University of Missouri Health Care

**Pediatric Diabetes/Endocrinology Position
All Ranks/All Tracks
Department of Child Health**

The University of Missouri-Columbia, Department of Child Health is seeking a faculty member in Pediatric Diabetes/Endocrinology (all ranks/all tracks). We seek applicants who are B/E or B/C, who have exemplary clinical skills, demonstrated evidence of sustained scholarship with a strong interest in teaching.

The University of Missouri is fully committed to achieving the goal of a diverse and inclusive academic community of faculty, staff and students. We seek individuals who are committed to this goal and our core campus values of respect, responsibility, discovery and excellence.

To apply for this position, please visit the MU website at hrs.missouri.edu/find-a-job/academic/.

Please submit your resume and cover letter to Rebekah Hadlow at hadlowr@health.missouri.edu

An Equal Opportunity/Access/Affirmative Action/Pro Disabled & Veteran Employer. Women and minorities are encouraged to apply.

Questions and ADA accommodation needs may be addressed to Rebekah Hadlow, Office Supervisor, 573-882-9743, Department of Child Health, 400 N. Keene Street, Columbia, MO 65201.



2016 FAES Endocrinology Update & Review Course

@ National Institutes of Health

October 26-30, 2016 | Bethesda, MD



Adrenal & Pituitary

Thyroid

Calcium

Diabetes

Pediatrics & Reproduction

Curriculum Highlights:

- Board Review Q&A and case studies
- New approaches to diagnose endocrine diseases
 - Risks and benefits of emerging treatments

Discounted Rates for Fellows & NIH Community



FAES@NIH
BIOTECHNOLOGY TRAINING WORKSHOPS

Register: www.FAEStraining.org

Phone: (301) 496-7977

Email: registration@faes.org



EndoCareers®

TAKING YOU FROM NOW TO NEXT

RECRUIT THE BEST CANDIDATES WITH ENDOCAREERS

Find the right endocrinologist for your job opening by advertising with EndoCareers. With print, online, and package opportunities, you can trust your message will reach your target audience with EndoCareers.

endocareers.org

To speak with a representative for print advertising opportunities, contact Julie Jimenez at jjimenez@pminy.com or 212.904.0360. For questions about our job board, please contact the Endocrine Society at endocareers@endocrine.org or 202.971.3636.



ENDOCRINE
SOCIETY



REGISTER NOW

CEU EBR

**CLINICAL ENDOCRINOLOGY UPDATE
ENDOCRINE BOARD REVIEW**

2016

endocrine.org/seattle

CLINICAL ENDOCRINOLOGY UPDATE
SEPTEMBER 8-10, 2016

ENDOCRINE BOARD REVIEW
SEPTEMBER 11-12, 2016

WASHINGTON STATE CONVENTION CENTER
SEATTLE, WA

ENDOCRINE
SOCIETY 

1916-2016
100 YEARS
OF HORMONE SCIENCE TO HEALTH