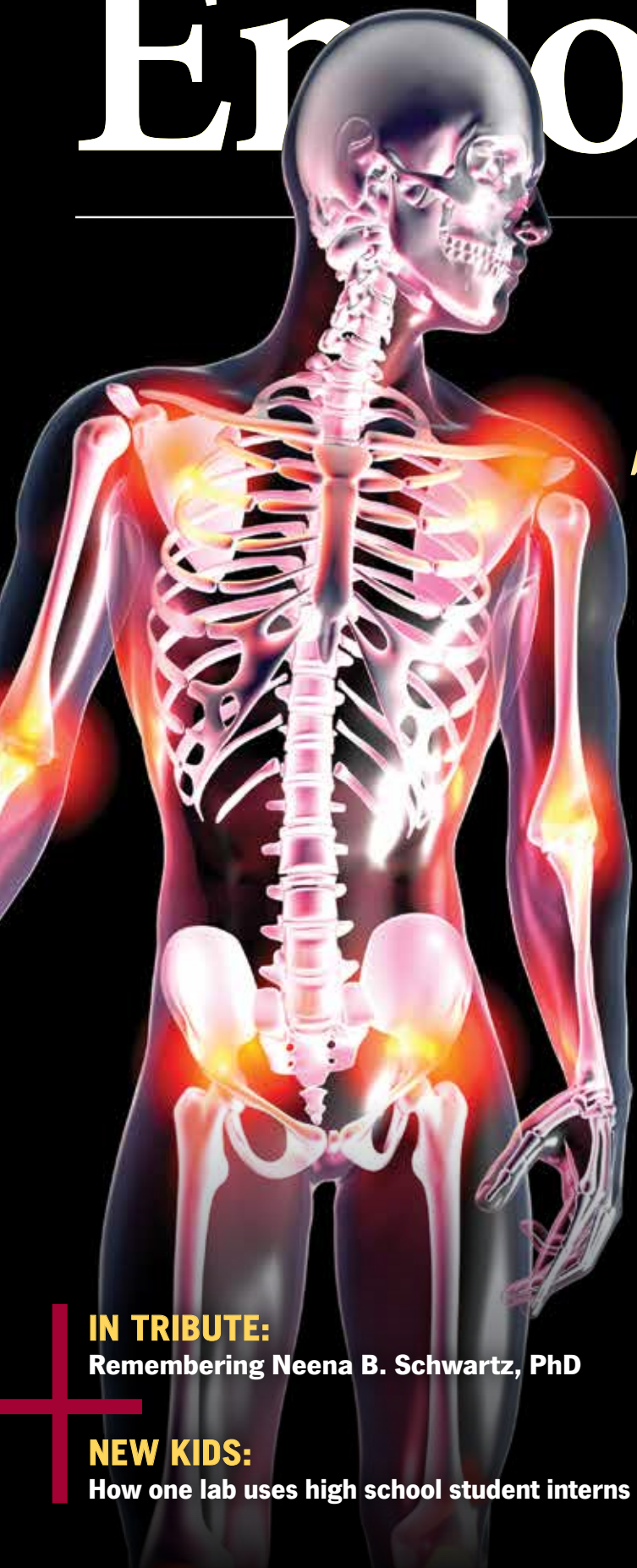
HOUSE CALLS: IMPROVING DIABETES OUTCOMES OVER THE PHONE

MAY 2018

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

Endocrine news



Skeleton CREW

BONES AND THE ENDOCRINE SYSTEM:

- **Bones & Obesity:** While the sitting versus standing debate has raged on for the past few years, a new rodent study adds credence to the notion that standing is healthier than being a couch potato.
- **Felicia Cosman, MD,** discusses her **ENDO 2018** talk on combination drug therapy and how it could change the way postmenopausal osteoporosis patients are treated.

IN TRIBUTE:
Remembering Neena B. Schwartz, PhD

NEW KIDS:
How one lab uses high school student interns

ENDOCRINE SOCIETY
Hormone Science to Health

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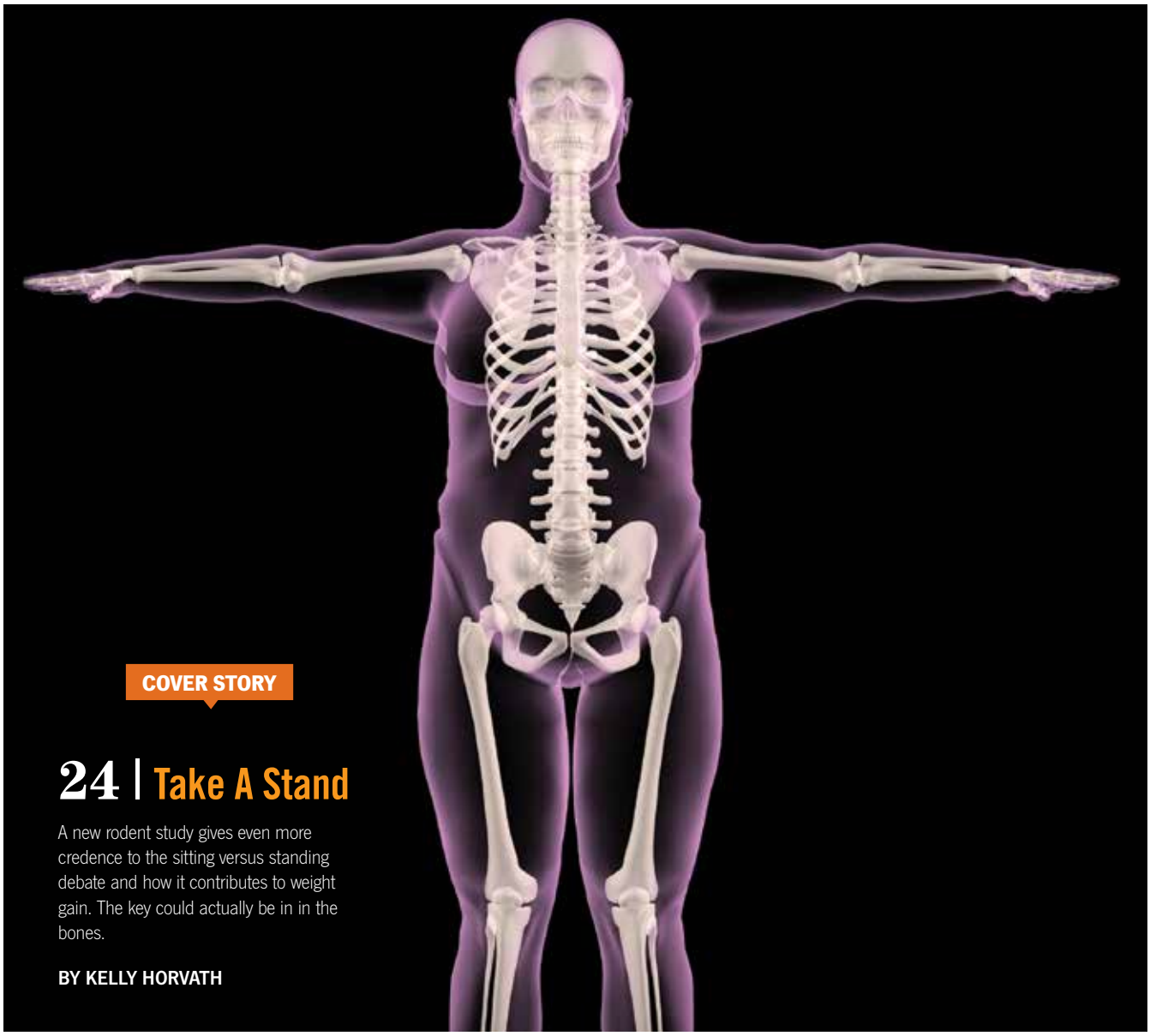

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Felicia Cosman, MD, from Columbia University discusses what the results from the ACTIVE and ACTIVExtend trials mean for postmenopausal patients with osteoporosis. Could a combination drug regimen prove to be the answer?

BY DEREK BAGLEY

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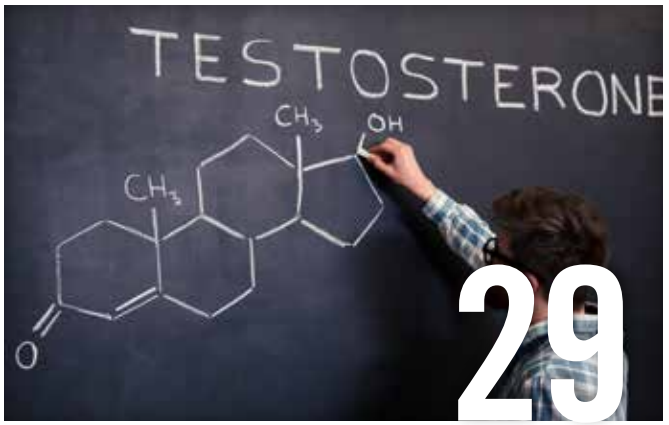

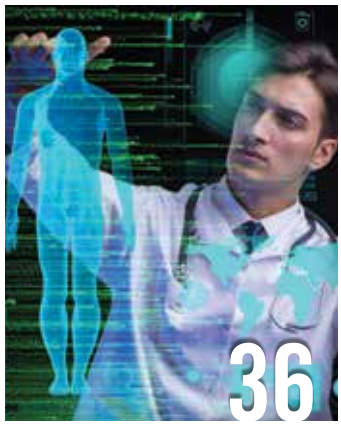

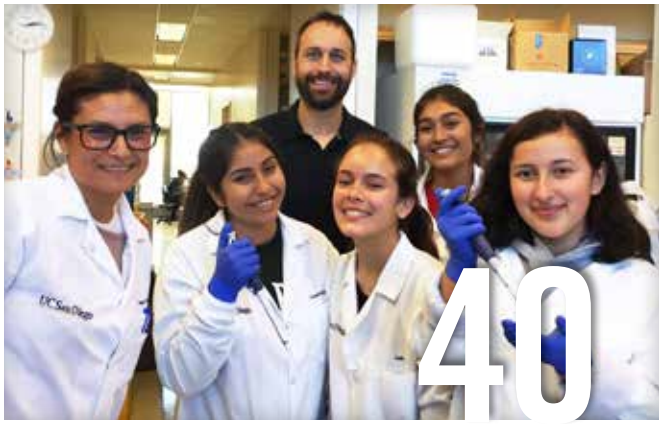

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ENDOCRINE SOCIETY
Hormone Science to Health

How Advocacy Helps Ensure the Future of Endocrinology

THE ENDOCRINE SOCIETY IS WIDELY recognized for its premier meeting and journals. Another important function some members may not be as familiar with is the Society's advocacy and policy work. Since becoming president, I have had the opportunity to participate in several policy efforts, and I strongly encourage members to do the same.

While the Society does not endorse specific political candidates, take partisan positions, or give money to political causes, it does participate in the development of U.S. legislation and regulations as well as several global advocacy efforts. Our Society's staff identify strategies to pursue policies important to our members and engage members with relevant expertise. There are many ways for members to contribute to our policy and advocacy work: You can help draft comment letters, position statements, and testimony; visit policymakers to educate them about our issues; represent the Society on advisory committees; or take part in an online advocacy campaign. All these efforts help influence policy and make a difference.

Policy priorities for this year include: increasing funding for biomedical research; reducing the prevalence of diabetes and improving access to treatment of obesity; protecting access to care, particularly for women and transgender patients; improving regulation of endocrine-disrupting chemicals (EDCs); and influencing new physician payment models. These are critical issues for endocrinology, for us, and for our patients. And, despite the tumultuous political times, the Society has had several big advocacy accomplishments since the beginning of the year. Our efforts supported the following:

- A $3 billion increase for the National Institutes of Health (NIH)
- Advocacy against dangerous loopholes in EDC criteria in the European Union
- Protection of the graduate student tuition tax waiver in tax reform legislation
- Renewal and full funding for two years of the Special Diabetes Program
- Reauthorization of the Children's Health Insurance Program
- Medicare coverage of continuous glucose monitors and Omnipod

> **"I believe you will gain personally from engaging in advocacy. You will learn new skills, build new relationships, and will have tremendous satisfaction knowing you helped shape the future of endocrine research and practice."**

The Society's policy work is on mach speed. Since becoming president in March, I have overseen policy letters ranging from comments on a proposed rule on statutory conscience rights in healthcare to advising Medicare to expand access to diabetes self-management training to recommending improvements to the NIH Task Force on Pregnant and Lactating Women to expressing concerns about conclusions drawn from the CLARITY-BPA Study. During this time, the Society also has partnered with the global March for Science, joined with other leading healthcare organizations to submit an *amicus* brief to the U.S. Supreme Court urging the Court to reinstate the injunctions against implementation of the Trump travel ban issued last September, and organized a briefing on EDCs for the European Parliament.

We are doing great work, but I want to see more of you engaged in advocacy. We need your expertise, thoughts, and feedback. We want to ensure policymakers hear from the experts in our Society about endocrinology. In addition, I believe you will gain personally from engaging in advocacy. You will learn new skills, build new relationships, and will have tremendous satisfaction knowing you helped shape the future of endocrine research and practice.

“We are doing great work, but I want to see more of you engaged in advocacy. We need your expertise, thoughts, and feedback. We want to ensure policymakers hear from the experts in our Society about endocrinology.”

I encourage you to find out more about our policy work. Keep an eye out for our electronic advocacy alerts. Join one of our online advocacy campaigns by visiting **www.endocrine.org/takeaction**. You can see all our position statements and policy letters by visiting **www.endocrine.org** and clicking the advocacy button.

If you have any questions, please contact our policy staff at *govt-prof@endocrine.org*.

I welcome your feedback and suggestions. Feel free to send me your comments at *president@endocrine.org*.

Remember, advocacy matters. EN

— **Susan Mandel,** MD, MPH, President, Endocrine Society

FROM THE **EDITOR**

Endocrine News Goes to the Supreme Court

IN A RECENT *AMICUS* BRIEF FILED WITH THE US SUPREME COURT opposing President Donald Trump's travel ban, an article in *Endocrine News* was cited as one of the reference documents stressing the importance of immigrant clinicians and scientists in the U.S.

Amicus briefs are legal documents filed in appellate court cases by non-litigants who have a strong interest in the subject matter. They advise the court of additional relevant information or arguments that the court might want to take under consideration.

The brief was in support of the respondents in the US Supreme Court case of Donald J. Trump, the U.S. Department of Homeland Security, Kirstjen M. Nielsen, the U.S. Department of State, Rex W. Tillerson, and the *United States of America v. the State of Hawaii*, Ismail Elshikh, John Doe 1, John Doe 2, and the Muslim Association of Hawaii, Inc. urging the Court to reinstate the injunctions against implementation of the travel ban issued last September. The Endocrine Society is one of more than 30 medical and academic societies supporting this brief.


Crossing Borders

"Crossing Borders," the referenced article, was a Q&A in the September 2017 issue that senior editor Derek Bagley conducted with Endocrine Society member Alaa Al Nofal, MD, a Syrian-born pediatric endocrinologist with a practice in rural South Dakota. In the article Al Nofal detailed his personal

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experience as an immigrant from one of the "banned" countries named in the travel ban. Aside from Syria, the other countries are Venezuela, Libya, Chad, Iran, Yemen, Somalia, and North Korea.

Derek learned of Dr. Al Nofal's situation by doing what any journalist does best: research. Upon further inquiry, Derek discovered that Dr. Al Nofal was indeed a member of the

> **While we endeavor each month to publish stories that will inform and entertain the Endocrine Society membership, it is heartening when an article is used beyond its original intent.**

Endocrine Society, and we decided it would be an ideal addition to the September 2017 issue. While we endeavor each month to publish stories that will inform and entertain the Endocrine Society membership, it is heartening when an article is used beyond its original intent. I've also had various educators tell me that they use *Endocrine News* articles in their classrooms.

But to have an *Endocrine News* article used as "evidence" for an argument in the Supreme Court is quite an honor ,and it further demonstrates one of the chief strengths of the magazine: You, the Endocrine Society member. EN

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

Remembering Neena B. Schwartz, PhD: A Lab and Life of Her Making

BY TERESA K. WOODRUFF, PhD, AND KELLY E. MAYO, PhD, NORTHWESTERN UNIVERSITY

"But you may say, we asked you to speak about women and fiction—what has that to do with a room of one's own? ... All I could do was offer you an opinion upon one minor point—a woman must have money and a room of her own if she is to write fiction…"

— VIRGINIA WOOLF, *A Room of One's Own*

"Now, I no longer have a lab of my own. What a strange place to be."

— NEENA B. SCHWARTZ, PhD, *A Lab of My Own*

Neena B. Schwartz died peacefully and in the presence of family on April 15, 2018, in Evanston, Ill., at the age of 91. She was a tremendous scientist, a pioneer for women in the sciences, and a leader in our discipline of endocrinology. These attributes and many more relating to her journey through life are captured brilliantly in her autobiography, *A Lab of My Own* (2010, Brill/Rodopi), which is required reading for members of the Northwestern Center for Reproductive Science, the organization she founded and led for the majority of its 30-year history.

Neena was an honors graduate of Goucher College in her native Baltimore, Md., and earned a PhD in physiology from Northwestern University in 1953. She accepted a position as instructor in physiology at the University of Illinois College (UIC) of Medicine, moved to Michael Reese Hospital, and returned to a tenured position at UIC, becoming both full professor and serving as dean of faculty affairs. In 1973, she moved to Northwestern University Medical School as chair of biology and after several years relocated to Evanston as a founding member of the Department of Neurobiology and Physiology, where she held the William Deering Professorship in Biological Sciences within the College of Arts and Sciences until her retirement in 1999. In 1980, she organized the Program in Reproductive Research and in 1987 became founding director of the Center for Reproductive Science, a peak experience for Neena in creating a home for the work that she loved and the faculty and students she recruited. Neena trained over 50 graduate students and postdoctoral fellows.

Neena was trained as a physiologist, and her laboratory focused on the factors that establish reproductive cycles in mammals. Perhaps most notable was her work on the role of ovarian inhibin in negative feedback regulation of FSH secretion in the female. One of her most impactful papers was published in *PNAS* in 1977, in which she and the late Cornelia Channing, a biochemist from the University of Maryland, described the identity of female inhibin (folliculostatin) in follicular fluid. Work prior to their discovery was primarily in the male, and this pivotal study opened the entire field of peptide negative feedback regulation and ushered in the discovery of the larger TGFβ-superfamily of ligands. The impact of her studies was recognized by her election to the American Academy of Arts and Sciences in 1992, among many other awards and honors.

Neena was a life-long learner in all respects. Following the

At the time of this picture (1998), from l to r, Neena Schwartz with Sue Smith, Peggy Shupnik, Kate Horwitz, and Maria New represented the living women officers or past officers of the Endocrine Society. (Shupnik was secretary treasurer at the time and would eventually become president.) "No one was happier than Neena that this roster is now longer."—Peggy Shupnik.

(PHOTO COURTESY PEGGY SHUPNIK)

cloning of inhibin, she quickly saw the promise of molecular biological approaches to complement her physiology and endocrinology expertise and spent a year sabbatical in the laboratory of the late Jack Gorski at Wisconsin, immersing herself in learning and applying this technology, a period Neena often described as one of the most impactful and enjoyable of her long career.

Neena was also a leader. Notably, in 1971, she was an organizer and first president (1971–1973) of the American Women in Science (AWIS). AWIS was founded and still advocates for an increase in the number of women in tenure track positions and on NIH study section review panels. In 1974, AWIS sued the NIH to stop all appointments to study section review panels. Famously, when provided with a list of over 400 study review panel section vacancies, AWIS responded by providing the names of 1,000 qualified women scientists. Neena was the president of the Society for the Study of Reproduction (1977–1978), president of the Endocrine Society (1982–1983), and co-founder of Women in Endocrinology. Her leadership was recognized by the Williams Distinguished Leadership Award of the Endocrine Society in 1985.

Neena loved birding, her cottage in Door County, Wisconsin, and the Chicago Symphony Orchestra. She was preceded in death by her partner, Claire Wadeson, a pioneer in her own right as an art therapist. Scwartz's legacy lives on in the discoveries she made, the people she trained, the organizations she formed, and the amazing life she led. She was a phenomenal mentor to each of us, and her guidance, friendship, and commitment to scientific rigor and excellence will all be greatly missed. EN

Deborah Blum Awarded Endocrine Society Award for Excellence in Science and Medical Journalism

MIT Knight Science Journalism Program Director and *Undark Magazine* publisher Deborah Blum received the Endocrine Society's annual Award for Excellence in Science and Medical Journalism.

Blum was honored for her coverage of the health effects soy milk and formula have on infants. The winning article, "The Great Soy Formula Experiment," was published in *Undark Magazine* in August 2017.

In her article, Blum examines how natural compounds in soy can interfere with estrogen hormones in the body and affect reproductive health. Compounds called phytoestrogens found in soy can act as an endocrine-disrupting chemical (EDC). Research has found EDC exposure is associated with a number of health problems, including male reproductive disorders, premature death, obesity and diabetes, neurological impacts, breast cancer, endometriosis, female reproductive disorders, immune disorders, liver cancer, osteoporosis, Parkinson's disease, prostate cancer, and thyroid disorders.

Blum is a Pulitzer Prize-winning science journalist, columnist, and author of five books, including *The Poisoner's Handbook* and *Love at Goon Park*. She is a former president of the National Association of Science Writers, was a member of the governing board of the World Federation of Science Writers, and currently serves as vice president of the Council for the Advancement of Science Writing. Blum is co-editor of the book *A Field Guide for Science Writers*. In 2015, she was selected as the fourth director of the Knight Science Journalism Program at MIT.

The Society established the journalism award in 2008 to recognize outstanding reporting that enhances the public understanding of health issues pertaining to the field of endocrinology.

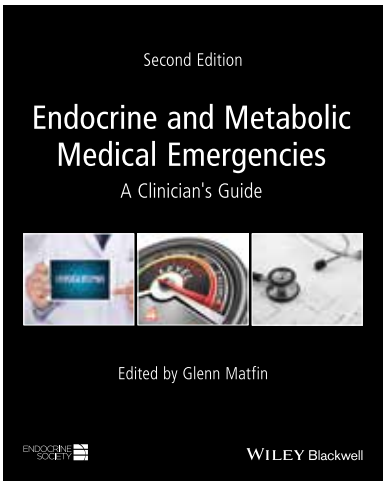
More information on the Endocrine Society Award for Excellence in Science and Medical Journalism is available at: https://www.endocrine.org/news-room/journalism-award.

The editor of *Endocrine and Metabolic Medical Emergencies* (2nd Edition), professor Glenn Matfin (on the left) presenting a copy of the book to professor Mutairu Ezimokhai (Provost, Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai, UAE) during a book signing event.

Updated Edition of *Endocrine and Metabolic Medical Emergencies* Published

A second edition of *Endocrine and Metabolic Medical Emergencies: A Clinician's Guide*, which was first published in 2014, was just released in March. Once again, Endocrine Society member Glenn Matfin, MSc, Mb ChB, FACE, FRCP, a consultant physician in acute and general internal medicine, diabetes, and endocrinology in the UK National Health Service, and professor of medicine, MBRU College of Medicine, Dubai, UAE, is serving as the editor of this updated version, which provides a singular reference to help endocrinologists, acute and general medicine clinicians, hospitalists and critical care physicians, and general practitioners recognize the symptoms of endocrine emergencies and provide the highest standards of care.

Endocrine News spoke to Matfin about what readers can expect from this new edition and why additional topics were added.



ENDOCRINE NEWS: What was the response to the first edition of *Endocrine Emergencies*?

GLENN MATFIN: Acute clinical care is a major focus for many healthcare providers including endocrinologists. In addition, patients with endocrine and metabolic emergencies constitute a large proportion of this general and specialist clinical workload. Unfortunately, many patients are not ideally managed due to the lack of excellent, up-to-date, and practical guidance. There is therefore an unmet need for a comprehensive clinician resource covering acute endocrine and metabolic emergencies. As the Endocrine Society is a world leader in education and translation of clinical endocrinology, it was understandable that this unmet need be addressed by the Endocrine Society. The first edition of *Endocrine and Metabolic Medical Emergencies* was published by Endocrine Press (publishing imprint of the Endocrine Society) in 2014. The purpose of the original and updated editions was to help fill this knowledge gap by collating existing evidence and best practices on the management of numerous everyday endocrine and metabolic emergencies facing clinicians.

The response to the first edition was very positive. It clearly helped to close this previously unmet educational and clinical practice need and hopefully translated into improved patient experience and outcomes. On another positive note, several endocrine training programs gave fellows a copy of this book on graduation. This is indirect support for the book's unique content, format, and utility. Ultimately, the book has progressed into an expanded second edition, which suggests it did (at least in part) fulfill its original objectives.

EN: What has been updated in this second edition?

GM: This expanded edition has been updated completely (with final edits into early 2018). The size and scope of the text has also increased with an approximate doubling in the number of pages (from 440 pages to 840) and larger page size. The second edition of the book has several new features including key points, case studies, and many new figures. Several special populations of patients discussed in the first edition (i.e. the unique impact of aging, pregnancy, and HIV/AIDS on emergency endocrine and metabolic disorders presentation and management) have been expanded in the second edition to include new chapters on endocrine and metabolic emergencies in transitional care, perioperative, late effects, inherited metabolic diseases, and transplantation patients. Several additional new chapters have been added throughout the book, and new authors have updated some of the previous chapters.

EN: Have you gotten any feedback on particular chapters that have proven to have had a real impact on patient care?

GM: The chapters with the most potential impact on patient care generally address the most common presentations in the acute care setting (e.g. hyponatremia, hypercalcemia, and all things diabetes-related including hypoglycemia). In addition, many of the chapters are written by leading thought leaders in the subject area. They have delivered the definitive, most accessible, jargon-free clinician resource for learning/updating clinical knowledge about their specific topic(s). Lastly, some chapters cover the thorny issues that are especially taxing to the clinician or areas not often addressed in other publications (such as the management of insulin pumps or concentrated insulin in the inpatient setting).

“Many of the chapters are written by leading thought leaders in the subject area. They have delivered the definitive, most accessible, jargon-free clinician resource for learning/updating clinical knowledge about their specific topic(s).”

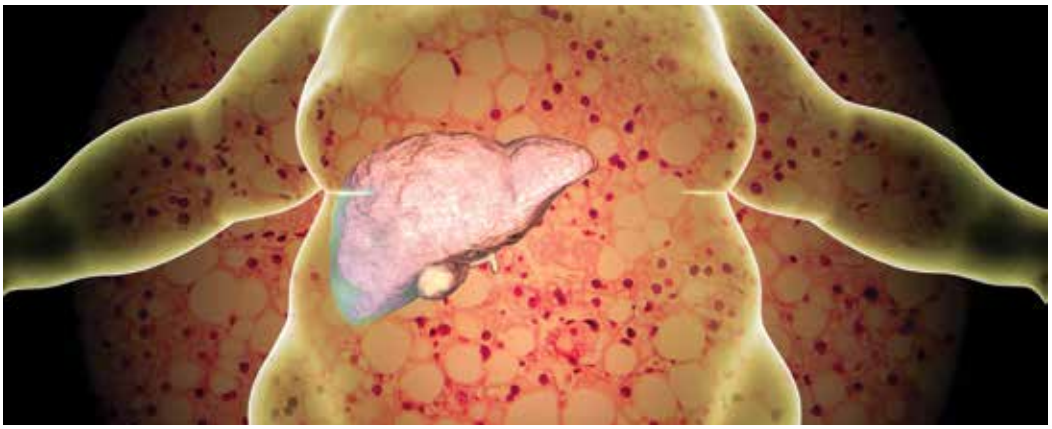
EN: What is the most misunderstood component of endocrine emergencies?

GM: Many patients with diabetes and endocrine issues/emergencies are not ideally managed in the acute care setting leading to unwarranted clinical variation. This can be due to many factors including lack of time, training, and/or expertise among healthcare providers. For example, many clinicians (especially junior doctors and non-endocrine specialists) believe that patients presenting with various emergency endocrine and metabolic disorders with abnormal values (e.g., level of glucose, sodium, osmolality, anion gap [closing the gap], and blood pressure) must be corrected to “normal” as quickly as possible. This practice can lead to increased morbidity and mortality (e.g., osmotic demyelination syndrome with over-rapid correction of hyponatremia). Preventing rapid- and over-correction by appropriate education, guidelines, care pathways, audit, and other resources (such as this book) may reduce unnecessary suffering and potentially save lives. EN

To order *Endocrine and Metabolic Medical Emergencies: A Clinician's Guide*, 2nd edition online, go to **www.wiley.com**.

BY DEREK BAGLEY
Senior Editor

NPC-1 Variants May Play Role in Metabolic Disease



> In a review of literature, the authors found evidence that *NPC1* variants are associated with adult-onset obesity, body fat mass, and type 2 diabetes. Carriers of these variants also have an increased risk of morbid obesity. Mice models confirmed these findings, showing an interaction with high-fat diet.

The Niemann-Pick type C1 (*NPC1*) protein may play a role in developing metabolic disease, according to a paper recently published in *Endocrine Reviews*.

The review, by Amel Lamri, PhD, of McMaster University in Hamilton, Ontario, Canada, et al., points out that *NPC1* regulates the efflux of cholesterol and fatty acids from the membrane of late endosomes/lysosomes and that *NPC1* loss-of-function results in *NPC1* disease, a rare disorder characterized by lethal neurodegeneration, as well as liver and lung failure due to cholesterol infiltration. However, *NPC1* variants are associated with other phenotypes. Other studies have reported that *NPC1* variants are linked to developing Alzheimer's disease, so the authors wanted to study the effects of *NPC1* variants on metabolic traits and disorders.

In a review of literature, the authors found evidence that *NPC1* variants are associated with adult-onset obesity, body fat mass, and type 2 diabetes. Carriers of these variants also have an increased risk of morbid obesity. Mice models confirmed these findings, showing an interaction with high-fat diet.

The authors of this review also suggest a mechanism for why these associations exist. They found that *NPC1* deficiency and haploinsufficiency have been associated with disturbed steroid hormone levels (corticosterone, estradiol, and testosterone) in mice. "However, the number of studies reporting these associations is still limited," the authors write. "Further studies are needed to firmly establish the causal relationship between *NPC1* genetic variations, steroid hormones levels, and metabolic disorders in humans and mice."

There are also associations between *NPC1* variations and changes in plasma and peripheral tissue lipids, according to the authors. "Nevertheless," they write, "whether a disturbed blood lipid profile is the main cause of the metabolic abnormalities associated with *NPC1* variants still needs to further investigation."

Findings: **The authors conclude the review by suggesting further genetic studies to discover new mechanisms in obesity, type 2 diabetes, non-alcoholic fatty liver disease, and other complex disorders. "However, some of the explicative models we propose remain speculative, and considerable work remains to be performed to refine the understanding of mechanisms linking *NPC1* to metabolism," they write. "We hope that this review, as well as the promising new areas of research investigation that have been proposed, will ultimately improve the health of NPC patients and the general population."**

Researchers Compare Health Status, Rates of Cardiometabolic Disease Between Transgender Adults and Cisgender Adults

Significant differences in health status and cardiometabolic health exist between transgender adults and cisgender adults in the U.S., according to a study recently published in the *Journal of the Endocrine Society.*

Researchers led by Natalie J. Nokoff, MD, of the University of Colorado Denver Anschutz Medical Campus in Aurora, point out that 0.5% of adults and 3.0% of youth identify as transgender in the U.S. However, little is known about the health of transgender adults, even though this is a growing population. What's worse, these patients experience harassment and discrimination in medical settings, their doctors are inadequately trained, and guidelines are often based on expert opinion and small studies from Europe.

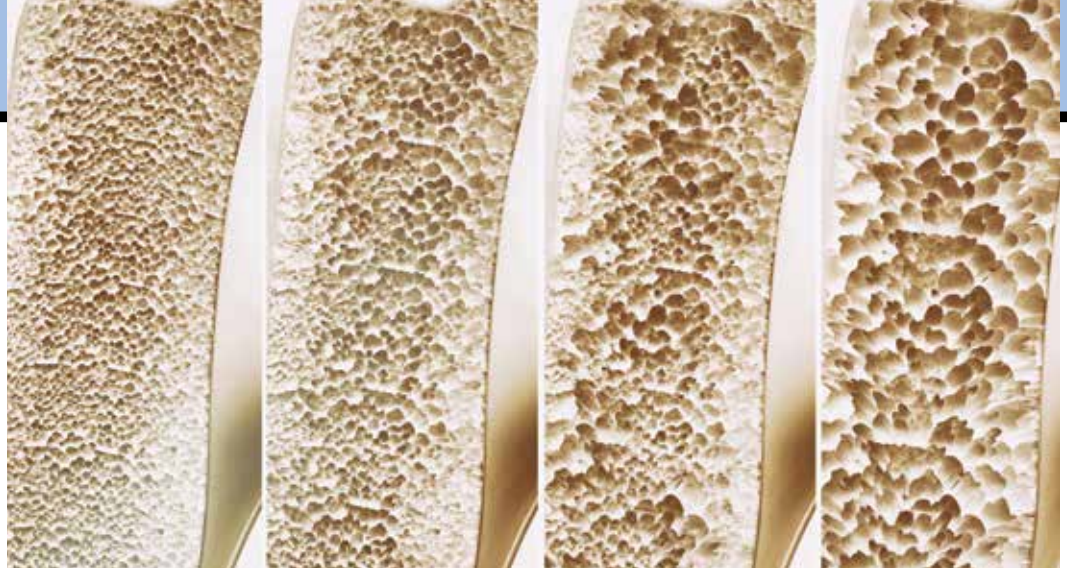
Nokoff and her team wanted to look at the health status and prevalence of self-reported cardiometabolic disease among specific subgroups of transgender adults — male-to-female (MTF), female-to-male (FTM), and gender noncomforming (GNC) — since hormone therapy has been linked to cardiometabolic risk factors. They hypothesized that all subgroups of transgender adults would be more likely to not have health insurance, compared to cisgender adults.

The researchers analyzed data from the 2015 Behavioral Risk Factor Surveillance System survey, from respondents who answered the transgender identity question. They found that FTM adults have higher odds of being uninsured than both cisgender women and men. "Contrary to our initial hypothesis," the authors write, "our analysis suggests that the lack of healthcare coverage in the transgender population is specific to the FTM population and probably accounts for the overall difference in healthcare coverage previously reported between transgender and cisgender adults." They go on to write that it's unclear why this would be the case, since previous studies have shown that most transgender adults are on hormone therapy, which would require more doctor visits.

The researchers also found that MTF adults were more likely to report myocardial infarction than cisgender women but not cisgender men, which could speak to the need for further studies of hormone therapy on heart health in transgender adults. "If most of the MTF adults in this study were on estradiol (which we do not know), these data may suggest that estradiol therapy in this population does not markedly increase MI or stroke risk above that associated with their biologic sex because there were no differences in odds of self-reported MI or strokes in MTF adults compared with cisgender men," the authors write. "Furthermore, if most of the FTM adults in this study were on testosterone, these data may also suggest that testosterone does not increase cardiometabolic disease because there were no differences between FTM adults and cisgender men and women."

Findings: Based on these results, the authors conclude that there are significant differences in health status and cardiometabolic health between subgroups of transgender adults and cisgender adults. "There is a need for additional research to elucidate the societal and medical (e.g., hormone therapy) effects on these outcomes," the authors write. "Additionally, a growing proportion of young people identify as GNC, and their health status and mental and physical health needs are distinct from those who identify as FTM or MTF, and they warrant additional study."

"Contrary to our initial hypothesis," the authors write, "our analysis suggests that the lack of healthcare coverage in the transgender population is specific to the FTM population and probably accounts for the overall difference in healthcare coverage previously reported between transgender and cisgender adults."



> In 2000, there were about 9 million osteoporotic fractures, and by 2050, the incidence of hip fracture is expected to increase by 240% in women and by 310% in men, according to the authors. 'To put this in further context, the number of women who will experience a fracture in one year exceeds the combined number of women who will experience incident breast cancer, myocardial infarction, or stroke.'

Targeting Cellular Senescence Could Halt Age-Related Bone Loss

Inhibiting cellular senescence could be a novel therapeutic strategy to prevent bone loss and other age-related diseases, according to a mini-review recently published in *The Journal of Clinical Endocrinology & Metabolism.*

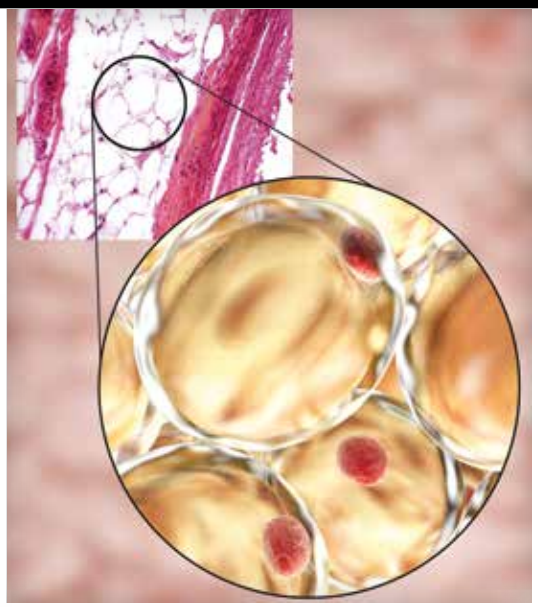
Researchers led by Sundeep Khosla, MD, of the Mayo Clinic in Rochester, Minn., write that while life expectancy now is longer than ever, age-related osteoporosis is a growing health problem. In 2000, there were about 9 million osteoporotic fractures and by 2050 the incidence of hip fracture is expected to increase by 240% in women and by 310% in men, according to the authors. "To put this in further context, the number of women who will experience a fracture in one year exceeds the combined number of women who will experience incident breast cancer, myocardial infarction, or stroke," they write.

Age-related osteoporosis often exists with other comorbidities like atherosclerosis and diabetes. Aging itself is the leading risk factor for these diseases, so the authors point to the "Geroscience Hypothesis," which posits that manipulating fundamental aging mechanisms can delay the appearance or severity of these age-related diseases. One of these fundamental aging mechanisms is cellular senescence, so the researchers wanted to focus on senescence's role in mediating age-related bone loss. The authors also write that there is declining interest by the pharmaceutical industry in developing new osteoporosis drugs. "However," they write, "placing osteoporosis in the context of treating multiple aging conditions offers perhaps renewed hope for new drug development for this important age-associated disease."

Using their own knowledge of the field and PubMed searches, the researchers found compelling evidence that there is an increase in senescent cells in the bone microenvironment with aging. "These cells produce a proinflammatory secretome that leads to increased bone resorption and decreased bone formation, and approaches that either eliminate senescent cells or impair the production of their proinflammatory secretome have been shown to prevent age-related bone loss in mice," the authors write.

Findings: **The authors conclude this review by writing: "Targeting cellular senescence represents a new therapeutic paradigm for preventing or even reversing age-related osteoporosis and simultaneously treating multiple aging comorbidities. This approach does not focus specifically on bone but rather on a fundamental aging mechanism operative across tissues. If the remarkable promise of preclinical models is realized in human studies, we may truly have a novel approach to enhance healthspan (and perhaps lifespan) in the rapidly growing aging population in the Unites States and throughout the world."**

Menopausal Hormone Therapy Associated with Less Adipose Tissue



Women who receive hormone treatment for menopause develop less fat mass (FM) and visceral adipose tissue (VAT), according to a study recently published in *The Journal of Clinical Endocrinology & Metabolism*.

Researchers led by Georgios E. Papadakis, MD, FMH, of Service of Endocrinology, CHUV, Lausanne University Hospital in Lausanne, Switzerland, point out that FM and VAT increase in women following menopause, while non-bone lean mass (LBM) decreases. So the researchers wanted to look at how menopausal hormone therapy (MHT) affects FM, VAT, and LBM before and after withdrawing treatment.

"When we studied a large sample of women to better understand the effect of menopausal hormone therapy on body composition, our research revealed that women were less likely to accumulate abdominal fat tissue while they were undergoing menopausal hormone therapy," Papadakis says. "However, the protective effect disappeared quickly after the participants stopped receiving menopausal hormone therapy."

The researchers examined data from a sub-study of the CoLaus study, an ongoing prospective study to assess factors that affect the outcomes of cardiovascular disease. The participants in the sub-study, called the OsteoLaus cohort, were postmenopausal women between the ages of 50 and 80. "After excluding women with estrogen-modifying medications, the 1,053 participants were categorized into current (CU), past (PU), and never (NU) MHT users," the authors write.

The women who were currently on menopausal hormone therapy exhibited significantly lower levels of abdominal fat tissue than women who had never received menopausal hormone therapy. The women going through menopausal hormone therapy also tended to have slightly lower total fat mass levels and body mass index measurements. Among women who had previously used menopausal hormone therapy, the analysis found no residual effect on abdominal fat tissue. Regardless of how long women underwent menopausal hormone therapy and how much time had elapsed since they used MHT, the results suggested they experienced a rapid rebound in fat accumulation.

Findings: **The authors conclude that MHT is associated with significantly decreased VAT, BMI, and android FM. No benefit is detected for LBM. The benefits are not preserved in PU, suggesting caution when MHT is discontinued. "Abdominal fat poses a risk for cardiovascular and bone health," Papadakis says. "When women stop menopausal hormone therapy, they need to be aware of the risk and ideally should increase their physical activity to combat the possibility of weight gain."** EN

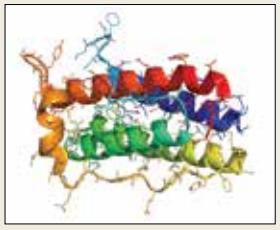
"When we studied a large sample of women to better understand the effect of menopausal hormone therapy on body composition, our research revealed that women were less likely to accumulate abdominal fat tissue while they were undergoing menopausal hormone therapy," Papadakis says. "However, the protective effect disappeared quickly after the participants stopped receiving menopausal hormone therapy."

"Osteoporosis is not a universal phenomenon. **We know that everybody loses bone but not everybody has to have osteoporosis.** And not everybody has to have this inexorable chronic progressive disease with more and more fractures."

— FELICIA COSMAN, MD, Columbia University, discussing the results of the ACTIVE and ACTIVExtend trials in a Q&A on page 32.

FROM THE CENTURY OF ENDOCRINOLOGY TIMELINE

1994: *Discovery of Leptin*



Jeffrey Friedman cloned the ob gene in mice and its homolog in humans in 1994. In 1995, Friedman purified the gene product, a hormone he called leptin. Friedman's discovery of leptin showed that there is a robust physiologic system that regulates food intake and metabolism, that fat is an endocrine organ, and that obesity is a problem of biology. Leptin acts to maintain homeostatic control of fat mass as follows.

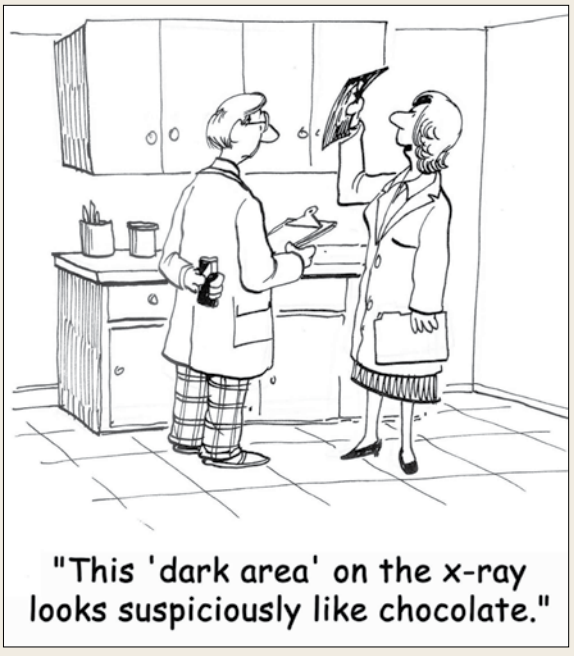
"The Discovery of Leptin, the Hormone that Regulates Body Weight." The Rockefeller University Hospital.

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

3%

Percentage of youth in the U.S. who identify as transgender.

— SOURCE: NATALIE J. NOKOFF, MD, ET AL., UNIVERSITY OF COLORADO DENVER ANSCHUTZ MEDICAL CENTER.



BY THE NUMBERS

TODAY:

Diabetes will claim **200 lives** and **200 limbs** in the U.S.

Diabetes will cost America **$671 million** in the next 24 hours.

8.1 million
Americans don't know they have diabetes.

— SOURCE: AMERICAN DIABETES ASSOCIATION

240% AND 310%

The amount by which the incidence of hip fractures are expected to increase by the year 2050. — SOURCE: SUNDEEP KHOSLA, MD, ET AL., MAYO CLINIC, ROCHESTER, MINN.

2018 Clinical Endocrinology Update/Endocrine Board Review

CEU/EBR East: Miami, Fla.
Sept. 4 – 8, 2018

CEU West: Anaheim, Calif.,
Oct. 18 – 21, 2018

www.endocrine.org/ebr/2018
www.endocrine.org/ceu/2018miami
www.endocrine.org/ceu/2018anaheim

Early Registration: Now — August 3, 2018

This year, endocrine clinicians from around the world will have a choice of which CEU they choose. CEU/EBR East will take place in Miami in September, while CEU West will land on the West Coast in October.

Miami's Intercontinental Hotel will be the location for the joint meeting of the 2018 Clinical Endocrinology Update (CEU)/ Endocrine Board Review (EBR) East from September 4 – 8, and the Hyatt Regency Orange County in Garden Grove, Calif., will be where CEU West takes place on October 18 – 21. Each year CEU brings together hundreds of endocrine clinicians for a unique learning experience and opportunities to network with expert faculty and colleagues. Attend the 70th CEU to receive the most trusted and clinically relevant information about recent advances in the field of endocrinology. The educational programming at CEU appeals to clinicians at all levels of practice, as well as fellows and other members of the clinical practice team.

Unlike other board preparation meetings, the Endocrine Society's EBR courses offer a comprehensive mock-exam format with case-based American Board of Internal Medicine–style questions forming the bulk of the presentations. Each section follows the ABIM blueprint for the board exam, covering the breadth and depth of the certification/ recertification examination. Each case will be discussed in detail, with the correct and incorrect answer options reviewed. The mock exam appeals to endocrine fellows who have completed or are nearing completion of their fellowship and are preparing to take the board certification exam. Practicing endocrinologists may appreciate the EBR's comprehensive self-assessment of endocrinology either to prepare for recertification or to update their practice.

16th World Congress on the Menopause

Vancouver, B.C., Canada, June 6 – 9, 2018

This world congress for midlife and global women's health is a multi-disciplinary meeting with an overarching theme of "Dealing with Midlife Health in the 21st Century." The program will cover women's health from pre- to peri-, through postmenopause, with a special focus on the problems of perimenopause and premature ovarian insufficiency.

http://www.imsvancouver2018.com

ADA 78th Scientific Sessions

Orlando, Florida, June 22 – 26, 2018

The Scientific Sessions offers researchers and healthcare professionals an opportunity to share ideas and learn about the significant advances in diabetes research, treatment, and care. Over the course of five days, attendees will receive exclusive access to original research presentations, take part in engaging exchanges with diabetes experts, and expand professional networks with attendees from around the world.

https://professional.diabetes.org

9th International Congress of Neuroendocrinology

Toronto, Ontario, Canada, July 15 – 18, 2018

At the ICN 2018, 64 state-of-the-art speakers and eight plenary lecturers will cover the excitement of modern neuroendocrinology from molecules to behavior, across four main themes — metabolism, reproduction, stress, and timing. Highlights include four concurrent symposium sessions, poster sessions with networking opportunities, and top research in neuroendocrinology from around the world.

www.icn2018.org

Endocrine Fellows Series: Osteoporosis & Metabolic Bone Diseases

Santa Fe, New Mexico, August 1 – 2, 2018

This two-day conference is designed for clinical endocrine fellows in adult and pediatric programs that are interested in bone diseases. Attendance is limited; interested endocrine fellows must submit an application by **May 17**. Invited fellows will receive a travel stipend to cover expenses to the osteoporosis conference and complimentary registration to attend the Santa Fe Bone Symposium.

awards@.endocrine.org

EndoBridge 2018

Antalya, Turkey, October 2 – 28, 2018

Jointly organized by the Endocrine Society, European Society of Endocrinology, and the Society of Endocrinology and Metabolism of Turkey, EndoBridge will provide a comprehensive update in the field of endocrinology. Held on October 25 – 28, 2018, in Antalya, Turkey, this meeting is 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

18th International Congress of Endocrinology and 53rd SEMDSA Congress

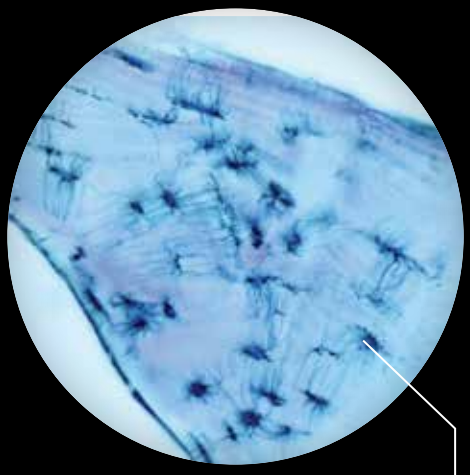
Cape Town, South Africa,
December 1 – 4, 2018

The Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) is hosting ICE 2018 with the 53rd annual SEMDSA Congress. The Program Organizing Committee is currently putting together a stimulating program including cutting-edge academic endocrinology for basic scientists and clinicians.

www.ice2018.org

A new rodent study gives even more credence to the sitting vs. standing debate and how it contributes to weight gain.

The key could actually be in the bones.



Microscopic image of a trabecular bone showing the osteocytes and their processes stained in blue color. Mice devoid of osteocytes did not lose weight with loading, pointing to osteocytes as a driver of the gravitostat by sending a signal to the brain to reduce food intake.

Take a STAND

BY KELLY HORVATH

In recent years, sitting has become the new smoking — apart from the obvious association with obesity, study after study has shown the deleterious effects that prolonged sitting has on multiple body systems, from endocrine to cardiovascular. Some studies even demonstrate that the link between obesity and sitting persists despite exercise. In other words, an individual does not have to be a confirmed couch potato to be affected.

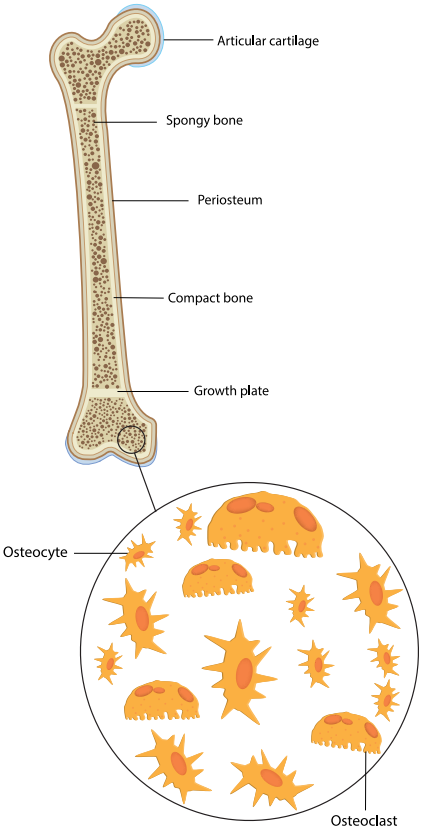
Nevertheless, with so much harm being attributed to sitting, periodically getting up and moving around is widely encouraged, and some office workers have even adopted standing desks, based on the premise that if sitting is so bad for health, standing should ward off its harmful effects. But new research suggests that standing does not just negate the effects of sitting — standing is itself a positive influence on health.

Feeling It in the Bones

A team of researchers from the Sahlgrenska Academy at the University of Gothenburg, in Sweden, decided to investigate the antiobesity effects that standing confers. "It seemed logical that the body can sense body weight to keep it constant," explains Professor John-Olov Jansson, one of the study designers. In "Body weight homeostat that regulates fat mass independently of leptin in rats and mice," published online in *Proceedings of the National Academy of Sciences*, Jansson and colleagues, including Claes Ohlsson, sought evidence that another mechanism in addition to the hormone leptin regulates body weight and fat mass. They surmised that this "sensor" would be located in the lower limbs and must send signals to an integration center in the brain.

To test their theory, they induced obesity in two- to three-month-old rats and mice via a high-fat diet and then "loaded" the rodents after three weeks to determine whether an internal mechanism would sense the load and kick in. In the experimental group of rodents, researchers intraperitoneally implanted capsules weighing 15% of a rodent's total body weight; the control group rodents were implanted with empty capsules, constituting about 3% of their body weight. Post-implantation, the rodents' body weight was measured daily or several times per week for the duration of each of a series of experiments.

Researchers noticed after just two days that the experimental group was losing biological body weight faster than the control group, as they expected. By day 14, the rodents in both groups weighed about the same in total body weight, suggesting that the experimental group lost more biological body weight due to the heavier artificial load they were carrying. "Artificial loading (about 12% of body weight) causes mice and rats to lose



almost as much body fat," Jansson says. In other words, the amount of weight the rodents lost approximated the amount of weight added by the artificial load. Moreover, magnetic resonance imaging demonstrated that the experimental group rodents also exhibited less white adipose tissue (considered the "bad" fat).

Taken together, these results supported the researchers' hypothesis that the body has a sensor that regulates body weight. To elucidate the mechanism underlying what they are calling this "gravitostat" (derived from combining the Latin words for "heavy" and for "stable"), they measured and compared levels of both brown adipose tissue (the "good" fat) and energy expenditure (as indicated by amount of activity and by physiologic indicators) between the two groups and found no significant differences. Importantly, however, the loaded experimental group consumed less food — they were compensating for the increased weight by eating less. The findings of decreasing food intake and reduced body weight were reproduced when capsules were implanted subcutaneously in other sets of rodents' backs.

A longer-term version of their study lasting 49 days upheld the gravitostat's ability to sense and respond to increased loading throughout the duration. Other important outcomes included increased insulin sensitivity and improved glucose tolerance in the weight-loaded rodents.

The research team also experimented with sustained versus temporary loading. When capsules were removed from the temporary loading group, biological body weight increased. Thus, the gravitostat works both ways — it senses when the body needs to lose weight to function efficiently as well as when the body needs to gain weight because it has become too lean.

Next, researchers wanted to know whether leptin, the so-called "satiety hormone," played a role here. In congenitally leptin-deficient mice, however, increased loading produced the same results, pointing to the gravitostat's independent ability to regulate weight.

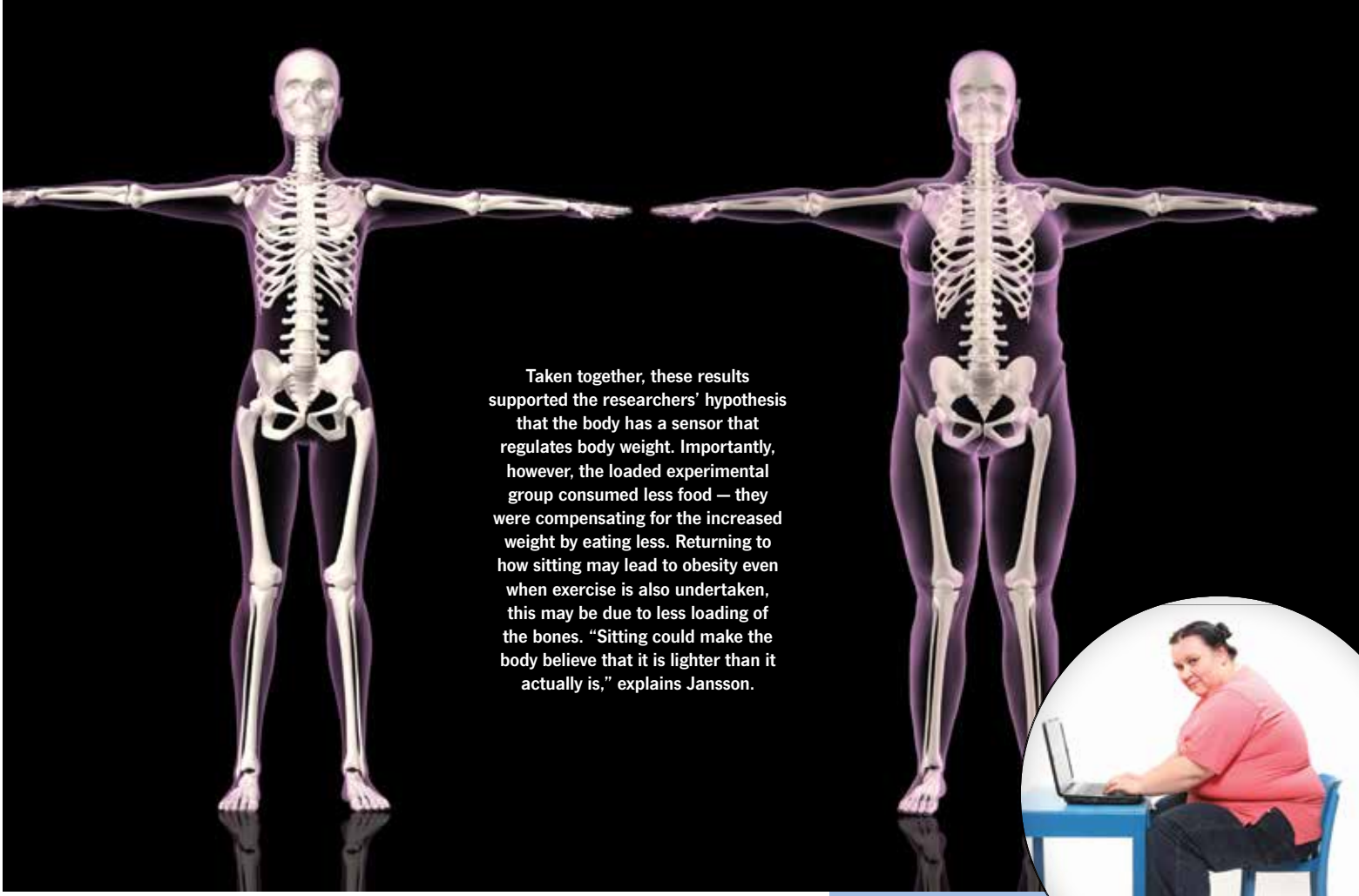
Finally, the team hypothesized that osteocytes, known to sense dynamic short-term high-impact bone loading for local bone adaptation, would also sense chronic static moderately increased bone loading, induced by increased body weight. Mice devoid of osteocytes did not lose weight with loading, pointing to osteocytes as a driver of the gravitostat by sending a signal to the brain to reduce food intake.

> **"It seemed logical that the body can sense body weight to keep it constant."**
>
> — JOHN-OLOV JANSSON, SAHLGRENSKA ACADEMY, UNIVERSITY OF GOTHENBURG, SWEDEN

Please Stand

Returning to how sitting may lead to obesity even when exercise is also undertaken, this may be due to less loading of the bones. "Sitting could make the body believe that it is lighter than it actually is," explains Jansson.

"Our interpretation is that the mechanism we describe may explain why many remain lean and keep body weight rather constant between age 20 and 70,"



Taken together, these results supported the researchers' hypothesis that the body has a sensor that regulates body weight. Importantly, however, the loaded experimental group consumed less food — they were compensating for the increased weight by eating less. Returning to how sitting may lead to obesity even when exercise is also undertaken, this may be due to less loading of the bones. "Sitting could make the body believe that it is lighter than it actually is," explains Jansson.

Jansson says. They will continue to study this topic, however, to investigate, for example, "...why people get obese despite the gravitostat. Some people may get obese even if they stand a lot, maybe due to genetic reasons. A lot of work needs to be done."

Ways of sitting may also be a future avenue for exploration: "One could imagine that squatting affects body weight regulation differently from chair sitting," Jansson says. Another is whether time spent standing can reverse any of the effect of time spent sitting.

As for whether the gravitostat might be employed in novel weight-loss therapies, Jansson and team prefer to: "Wait to draw conclusions until we have results from well-conducted studies in humans." Nonetheless, the implications for these findings are compelling and just might deserve a standing ovation. EN

HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. IN THE FEBRUARY ISSUE SHE WROTE ABOUT THE RISKS OBESE YOUTH FACE OF DYING FROM A CARDIAC EVENT IN MIDDLE AGE.

AT A GLANCE

- A novel fat and weight regulatory mechanism in the body that operates independently of leptin may help to explain why sitting is so detrimental to health.
- When rodents were "loaded" with increased weight, their body fat decreased, and their blood glucose levels improved, despite an unchanged level of motor activity, which suggests that the fat loss was mainly the result of reduced food intake.
- Apparently, when the osteocytes of weight-bearing bones sense an increased load (body weight), they signal the brain to decrease food intake.

Endocrine News **talks with Shalender Bhasin, MD, chair of the task force that created the latest Endocrine Society Clinical Practice Guideline on testosterone treatment. He discusses why it was important for the Society to update such a guideline now and why he thinks it will improve the care these patients receive in the future.**

Q&A: Shalender Bhasin, MD

In March, the Endocrine Society issued a Clinical Practice Guideline on testosterone therapy, the first such guideline since 2010, and it focuses specifically on hypogonadism.

Titled "Testosterone Therapy in Men with Hypogonadism: An Endocrine Society Clinical Practice Guideline," the guideline was published online March 17 and will appear in the May 2018 print issue of *The Journal of Clinical Endocrinology & Metabolism.*

Over the last few years, testosterone treatments have become part of the common lexicon as more and more products are being released to the market and advertised on television. Unfortunately, some of the information that so many patients tend to find on their own via various websites may not be very reliable. "The patients — and the clinicians caring for them —would find the updated guideline particularly helpful," says Shalendar Bhasin, MD, chair of the task force that authored the new guideline. "Especially because of the large amount of inaccurate and often contradictory information about testosterone available on the Internet."

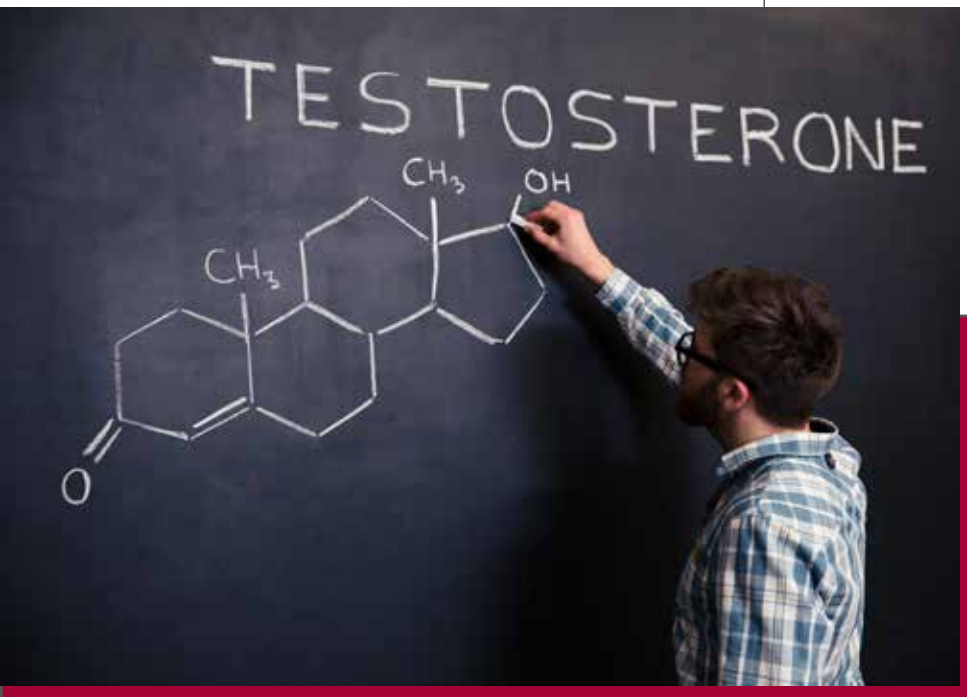
Endocrine News spoke with Bhasin, of Brigham and Women's Hospital in

Boston, to find out how this guideline will provide accurate information about testosterone treatments for hypogonadal patients as well as serve as a helpful tool for general practitioners, urologists, and other specialists who treat these patients.

ENDOCRINE NEWS: What was the main reason for the development of a guideline on hypogonadism and testosterone? What drove the decision, and why now?

SHALENDAR BHASIN: This updated guideline is very timely for many reasons. In a reflection of the growing attention on issues related to men's health, men's health clinics have mushroomed all over the country. The men who attend these clinics do so largely for sexual, reproductive, and urologic health concerns involving common conditions. Among these, androgen deficiency is a leading motivation for men to seek medical attention. Second, some of the most important, high-quality, randomized trials of testosterone have been published during the past three years, enabling a more rigorous appraisal of testosterone's efficacy and safety than had been possible without these data in previous versions of the guideline. Thus, a confluence of these scientific and societal factors — availability of novel, high-quality evidence; continuing uncertainty about the benefits and risks of testosterone therapy; suboptimal testosterone prescribing practices; and rapid growth of testosterone prescriptions in the U.S. all motivated this timely update of the testosterone guideline.

> **"We hope that the guidance offered by the Endocrine Society guidelines will enhance the overall quality of medical care and outcomes of hypogonadal men."**



EN: What impact do you anticipate the guideline recommendations will make on

> **"The guideline emphasizes the use of accurate assays for the measurement of total and free testosterone and rigorously derived reference ranges for the interpretation of testosterone levels."**

endocrine standards of care of the patient with hypogonadism?

SB: This evidence-based guideline should enhance the standards of care for the patient with hypogonadism. Recent surveys of testosterone-prescribing practices indicate that many men get prescribed testosterone treatment without an appropriate diagnostic workup or a monitoring plan. Some men receiving testosterone treatment do not have adequately documented hypogonadism, while others with hypogonadism are not receiving the needed treatment. The treatment discontinuation rates are high among men receiving testosterone prescription. In one study, as many as 50% of men prescribed testosterone discontinued treatment within three months, and only a quarter of men who received a testosterone prescription were still on testosterone treatment after one year. We hope that the guidance offered by the Endocrine Society guidelines will enhance the overall quality of medical care and outcomes of hypogonadal men.

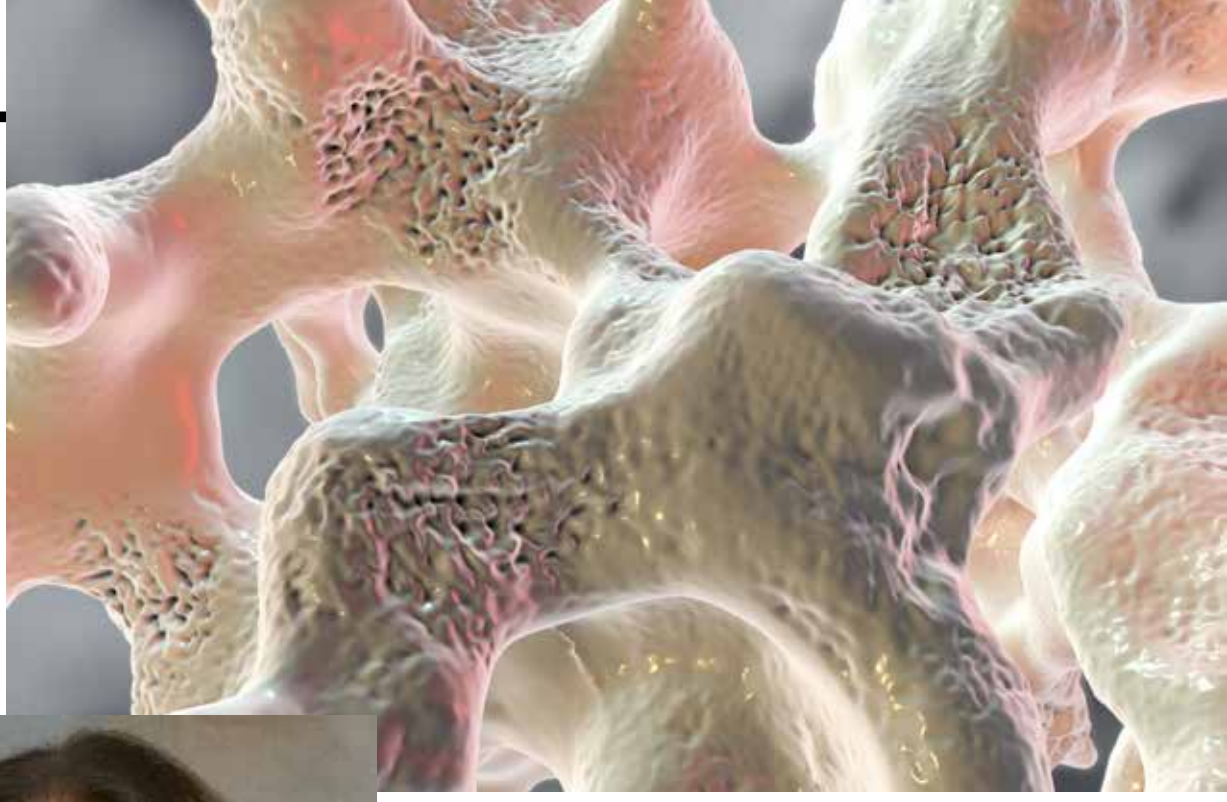
EN: How do you see the guideline influencing medical specialties other than endocrinology?

SB: Endocrinologists play an important role in the diagnostic work-up, treatment initiation, and monitoring of hypogonadal men receiving testosterone treatment. However, many hypogonadal men receive their care in primary care clinics or in urology clinics. The testosterone guideline would be of value to primary care providers as well as to other specialists who care for hypogonadal men.

EN: What are the key take-home messages for patients in this guideline?

SB: The updated guideline offers several helpful suggestions for the patient and the clinician on what symptoms and signs should prompt screening for testosterone deficiency; how to

diagnose and treat hypogonadal men; and how to optimize benefit to risk ratio using a standardized monitoring plan. The guideline emphasizes the use of accurate assays for the measurement of total and free testosterone and rigorously derived reference ranges for the interpretation of testosterone levels. The diagnosis should not be made based on a single testosterone level or without appropriate consideration of symptoms and signs, and overall health of the patient. The guideline provides an up-to-date perspective on the potential benefits and risks of testosterone therapy using rigorous analyses of the newly available, high-quality, randomized clinical trials evidence. The guideline addresses some of the controversies in the androgen field related to the prostate and cardiovascular safety of testosterone, and offers guidance on how to consider these uncertainties in making the clinical decision to treat. The guideline emphasizes the importance of patient engagement in a shared decision-making process, especially with respect to the choice of treatment regimens and prostate monitoring. EN



Spongy bone tissue affected by osteoporosis

Felicia Cosman, MD, from Columbia University, discusses what the results from the ACTIVE and ACTIVExtend trials mean for postmenopausal patients with osteoporosis. Could a combination drug regimen prove to be the answer?

BY DEREK BAGLEY

Q&A: Winning Combinations: Sequential Drug Therapy for Osteoporosis

The 100th annual meeting of the Endocrine Society, **ENDO 2018** in Chicago, set the stage for a number of scientific advancements and progress in endocrinology. Among them was a presentation of positive results from the ongoing ACTIVExtend trial, a continuation of the Abaloparatide Comparator Trial In Vertebral Endpoints (ACTIVE), which looked at the drug abaloparatide's efficacy in treating postmenopausal women with osteoporosis.

The results of the original ACTIVE trial were published in the *Journal of the American Medical Association* in August 2016, and they showed that abaloparatide was more effective at reducing fractures and even increasing bone mineral density (BMD) compared to placebo. At the time, the authors concluded that "further research is needed to understand the clinical importance of … the risks and benefits of abaloparatide treatment, and the efficacy of abaloparatide versus other osteoporosis treatments."

In February 2017, *Mayo Clinic Proceedings* published the first six-month results of the ACTIVExtend trial, which examined what would happen if the women who completed 18 months of abaloparatide or placebo in the ACTIVE trial were then transitioned to the antiresorptive drug alendronate. In this scenario, anabolic therapy with abaloparatide is used to grow bone, improve bone density, and repair bone microarchitecture. And then, there's the need to consolidate that with an antiresorptive drug afterward in order to maintain or even enhance abaloparatide's benefits. The study was designed to be one-and-a-half years of the blinded trial followed by everybody transitioning to the active antiresorptive agent for a total of two years.

Most recently, final results from the three-and-a-half year ACTIVExtend trial were presented at **ENDO 2018**. ACTIVExtend has shown that women treated with abaloparatide and then alendronate saw an 84% reduction in new vertebral fractures and a 39% reduction in non-vertebral fractures. BMD increased in spine and hip sites during the ACTIVE trial with abaloparatide and continued to increase after transition to alendronate. Parallel increases were seen during the latter two years when women from the placebo group transitioned to alendronate. Final BMD increments (from ACTIVE baseline) were 14.4% in the spine and 6.4% in the total hip in the group that transitioned from abaloparatide to alendronate compared with 6.5% and 2.8%, respectively, in the group that transitioned from placebo to alendronate.

Felicia Cosman, MD, an osteoporosis specialist and medical director of the Clinical Research Center at the Helen Hayes Hospital, senior clinical director of the National Osteoporosis Foundation, and professor of medicine at Columbia University, has been studying the effects of these drugs for a few years now. She was an author of the original ACTIVE trial paper and the lead author of the first ACTIVExtend trial paper. *Endocrine News* spoke with her to discuss her work, what it means for patients with osteoporosis or at risk of fractures, as well as what it means for endocrine science overall.

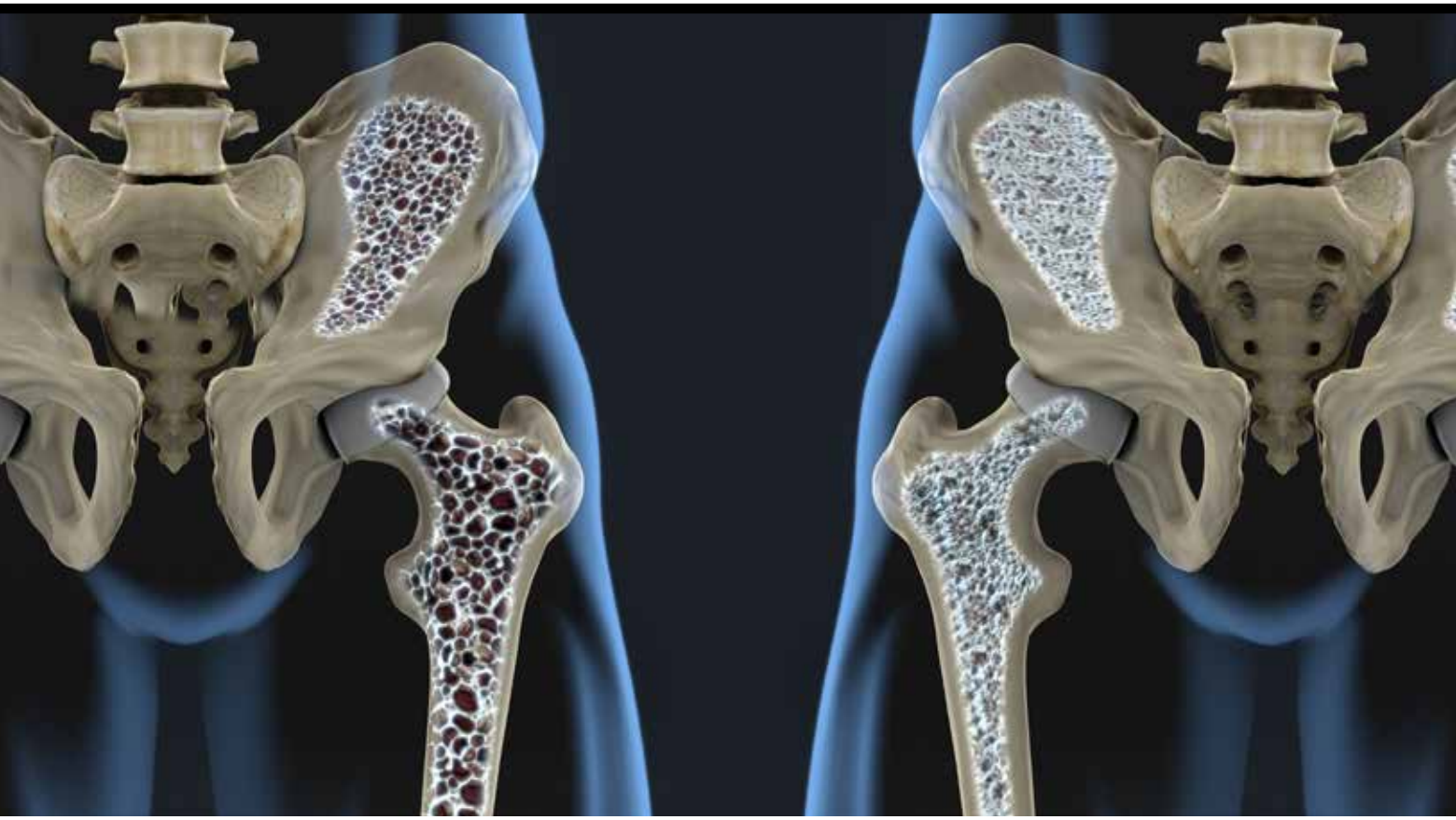
ENDOCRINE NEWS: First off, tell me about this ongoing work and your findings.

FELICIA COSMAN: What is really exciting about these findings is that it shows just how dramatic a benefit you can get with a short course, one-and-a-half years of a potent bone-building therapy. It's this kind of proof of concept that I've been thinking about for a long time. If we could identify patients who are at high risk for fractures based on their fracture history or based on their bone density, we could make a very big difference in their long-term fracture risk by starting with a medication such as abaloparatide. And then, treating with antiresorptive therapy.

EN: What's the mechanism? Why transition from this potent drug to this antiresorptive drug?

FC: We never envisioned that any bone-building therapy would be a life-long treatment. We always thought that this would be a short-term treatment, and we are generally not

"Osteoporosis is not a universal phenomenon. We know that everybody loses bone but not everybody has to have osteoporosis. And not everybody has to have this inexorable chronic progressive disease with more and more fractures."



recommending that abaloparatide be used for more than 18 to 24 months. That's the FDA guidance on it. And we know that with almost all osteoporosis therapies that if you stop the therapy and you don't transition to something else, you're going to lose bone. We don't want to give a drug like abaloparatide and then stop it and lose the benefits that we gained. Instead, we want to transition to a good antiresorptive drug to enhance and maintain the BMD and bone strength gains and sustain the fracture reduction benefits

In the case of ACTIVExtend, we used alendronate, but we're not suggesting that antiresorptive therapy after abaloparatide be restricted only to this medication. We think that the benefits will apply to other antiresorptive therapies too, so that's up to the choice of the physician and the patient in terms of which is the best one. But the idea of transitioning from abaloparatide to an antiresorptive drug and maintaining these incredible antifracture reductions over the entire period of time, based on that one-and-a-half years of anabolic, that's what's so exciting about this study.

EN: You say you've been thinking about this for a long time. Tell me about the origins of where this sort of hypothesis came from. When did the light bulb come on?

FC: It really comes from the fact that people with osteoporosis have a deficiency in their bone mass, as well as their bone structure. When you give an antiresorptive agent, by and large, what you're doing is preventing more deterioration of bone tissue, and you kind of fill in the remodeling space; any of the open remodeling cavities you fill in that are open at the time that you initiate the antiresorptive medication. This permits some true increase in bone mass. At the same time, you stop or dramatically reduce the number of new resorption cavities from starting. But ultimately, you suppress both the breakdown and the formation of bone, and you kind of live at this new equilibrium. The only bone gained at this point is through further mineralization of the existing bone, but no new bone tissue itself.

Of course, antiresorptive medications do reduce fractures, but they do not cure osteoporosis. In contrast, medications like abaloparatide stimulated the formation of bone tissue and allowed the repair of the bone structure, as well as dramatic improvements in bone mass. Both of these strengthen bone and can approach the idea of a cure, or at least a remission from osteoporosis.

EN: Tell me about the reactions you've received from the endocrine community.

FC: I think that the community was extremely gratified by the study. It was very well received. The effects were larger even than what we suspected. And keep in mind again that we're not comparing abaloparatide versus placebo over these 42 (or 43) months. We're comparing abaloparatide versus placebo over just one-and-a-half years out of a three-and-a-half-year trial where everybody is on active therapy for two of those three-and-a-half years. I think the results of this study are adding to what I see as a growing consensus of opinion that we are going to really produce better long-term effects against fracture if we start with the more proactive approach. Anabolic treatment with abaloparatide being one of the most effective ways to do this. In addition, clearly we see better short-term results beginning with anabolic treatment, with rapid significant reductions in both vertebral and nonvertebral fractures in just 18 months of therapy.

EN: Where do you go from here? You talked about this sort of being on a path to at least remission for osteoporosis. What's next for your group?

FC: In osteoporosis right now, we have a real crisis that is both on the side of recognition of the problem as well as on the side of how to treat patients. We recognize that doctors are very busy, and there are so many things they have to do in short times with their patients, especially general practitioners. Somehow osteoporosis has kind of gone to the bottom of the list. We want to try to put osteoporosis back to the top of the radar screen for doctors because fractures are one of the main causes of disability and loss of independence, loss of quality of life, and ultimately mortality in older individuals. We know that the average age of the population is increasing and that over the next 20 years, the number of at-risk patients will increase dramatically. The cost to individuals, families, and society as a whole will be overwhelming.

One of the key points that doctors are often missing is that a fracture that occurs in a woman who's 60, in a minor fall, is a sentinel event. That is when we need to get really busy making sure that the patient understands that the fracture was caused because the bone is weak from osteoporosis and that treatment is needed. We believe that one of the best ways to treat that person is an approach such as abaloparatide followed by a good antiresorptive therapy. Risk for more fractures is extremely high in the first few years after an initial fracture occurs so treatment that reduces that risk very rapidly is optimal.

EN: What would you want your fellow Endocrine Society members to take away from these studies?

FC: That osteoporosis is not a universal phenomenon. We know that everybody loses bone, but not everybody has to have osteoporosis. And not everybody has to have this inexorable chronic progressive disease with more and more fractures. With the ACTIVExtend trial, we have to produce a major remission in the disease of osteoporosis. We have almost obliterated vertebral fractures, and we've reduced half of all the major osteoporotic fractures. This is really a great advance in our field. And I hope that endocrinologists will be the thought leaders in bringing this message to the rest of the medical community. EN

BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. HE WROTE ABOUT ENDO HIGHLIGHTS IN THE APRIL ISSUE.

"Of course, antiresorptive medications do reduce fractures, but they do not cure osteoporosis. In contrast, medications like abaloparatide stimulated the formation of bone tissue and allow the repair of the bone structure, as well as dramatic improvements in bone mass. Both of these strengthen bone and can approach the idea of a cure, or at least a remission from osteoporosis."

House CALLS

ARCHANA BANDI, MD

BY DEREK BAGLEY

The telediabetes program used by the VA Pittsburgh Healthcare System combines electronic consulting with ongoing telephone-based care. The results show that this form of healthcare could improve outcomes in patients with type 2 diabetes, especially in rural areas where endocrinologists are scarce.

The number of endocrinologists continues to dwindle, while rates of two of the main conditions these physicians treat — obesity and diabetes — trend ever upward. It's an uphill battle, to be sure, but endocrinologists are adding new weapons to their arsenals all the time, especially as technological advancements make their way downstream. And some researchers hope these innovations paradoxically lead to a form of old-school medical practice, especially in underserved areas — a modern take on the house call.

A late-breaking abstract presented at **ENDO 2018** in Chicago detailed the results of a study conducted at the Veterans Affairs (VA) Pittsburgh Healthcare System, where researchers are determining the efficacy of a telehealth program for diabetes self-management. Its "telediabetes" program merges an electronic consultation, or e-consult, from an endocrinologist specializing in diabetes with ongoing telephone-based care, and unlike a typical e-consult meant to be a one-time recommendation, this program provides team-based care with follow-up.

The results presented at **ENDO** are promising. A research team led by Archana Bandi, MD, clinical director of Telehealth Services for VA Pittsburgh Healthcare System, compared results for 442 patients who participated in the e-consult program and another 407 patients who had a traditional face-to-face visit and follow-up care. All patients were veterans with type 2 diabetes who were referred from remote VA facilities between 2010 and 2015 for a consultation about improving their blood sugar control. On average, it took 37 days to obtain a face-to-face consultation, compared to just 10 days for an e-consult. Patients in both cohorts saw significant improvements in their A1c, even after a year.

"Without incurring any travel, our electronic consultation program provides equally efficacious diabetes care with significantly expedited access," Bandi says. "This type of e-consult is a viable alternative to traditional face-to-face care delivery, especially in remote areas with a shortage of endocrinologists."

This team-based approach is especially beneficial to those with diabetes, according to Bandi. Patients need support on a number of fronts: adopting to and maintaining a healthy lifestyle; management of risk factors such as dyslipidemia, hypertension, smoking cessation; and management of diabetes. "A team consisting of critical elements such as a nutritionist, diabetes educator/coach, mental health support services if needed, and a group of advanced practitioners supervised by the endocrinologist in a well-structured manner can support a larger body of patients than current care models allow," she says.

> "Given the chronic nature of diabetes, we decided to merge e-consult — i.e., one-time review and recommendations — with a brief (three to six month) telephonic continuity of care for an individualized goal-driven care. **If designed well, e-consults can be a very elegant solution for folks who have difficulty finding state-of-art care within reasonable driving distance."**
>
> — ARCHANA BANDI, MD, CLINICAL DIRECTOR OF TELEHEALTH SERVICES, VA PITTSBURGH HEALTHCARE SYSTEM

Elegant Solution

In 2010, VA Pittsburgh Healthcare System participated in a pilot study funded by the Office of Rural Health to examine patient satisfaction of specialty care delivery via e-consult for diabetes, cardiology, and renal specialty care. Based on high -satisfaction scores of patients and primary care providers, e-consults were incorporated as a standard care delivery modality for veterans across the board nationwide. And because Veteran Health Affairs (VHA) has a unified medical

records system, it makes processes like e-consults efficient, safe, and reliable methodologies. "While traditionally e-consultation is considered a mechanism of consultation between primary care and specialist to provide brief chart review and limited recommendations, our approach at VA Pittsburgh Healthcare System for telediabetes/e-consult differed significantly," Bandi says.

Here's how it works: An endocrine provider reviews the patient's medical record and conducts a 20- to 30-minute phone interview with the patient and family, before electronically sending the referring physician recommendations to share with the patient on lowering his or her blood sugar levels. A nurse on the diabetes care team monitors the patient's progress via phone calls over the next three to six months, and the primary care provider obtains all needed laboratory tests and makes recommended changes in therapeutic regimen. Patients are also offered ancillary services such as nutrition counseling and diabetes education services close to home.

"Given the chronic nature of diabetes, we decided to merge e-consult — i.e., one-time review and recommendations — with a brief (three to six month) telephonic continuity of care for an individualized goal-driven care," Bandi says. "We used this period as an opportunity to provide education, intensify or de-intensify treatment, and address other standards of care, such as a retinal exam and foot care among others. We used our existing infrastructure of primary care services as our partners, which helped us to decentralize the specialty care from centralized hub locations to remotely located patients. If designed well, e-consults can be a very elegant solution for folks who have difficulty finding state-of-art care within reasonable driving distance."

A Method To Modernization

Bandi says she doesn't see telediabetes programs as a means to deliver initial consultations for patients who have suffered major complications from long-standing diabetes such as retinopathy leading to blindness, patients requiring dialysis due to end-stage renal disease, elderly patients with hearing difficulties, or those who are at risk from hypoglycemia or have hypoglycemia unawareness, patients who are candidates for insulin pump therapy, or patients with major mental health issues like severe PTSD or schizophrenia.

But she does see these programs as ways to modernize practices, especially with the arrival of newer therapies like GLP-1 analogs, SGLT-2 inhibitors, DPP-4 inhibitors, and the many newer basal insulins. "Anecdotally, primary care providers in Veteran Health Affairs have expressed difficulty in keeping up with such advances and incorporating them in routine patient care," Bandi says. "I am sure this experience is not unique to VHA and likely shared by primary care providers in non-VA organizations. Thus, e-consults can be

an excellent means to address well known primary care inertia of timely escalation or modification of therapies on a larger scale for patients with early diabetes to improve glycemic control and prevent long-term complications."

Still, she does expect some pushback, especially from endocrinologists who are overworked and underpaid. Reimbursement models vary from state to state, and even among institutions. Bandi was able to carry out this work and develop this model where care is not driven by revenue. "E-consults have a huge role to play in addressing the shortage of specialty care, improving timely access to quality care, and addressing the chronic problem of poor care of diabetes, especially where there is a shortage of providers," she says. "However, it cannot be a successful strategy unless healthcare organizations, the insurance industry, and payers provide incentives for the endocrinologists to change their practices and mindset as well."

Treating Patients Close To Home

Bandi may expect some pushback, but she has advice for endocrinologists considering adopting this telediabetes model or a similar one:

1. **Partner with administration to create an internal mechanism to capture time-based workload until reimbursement for e-consults becomes routine;**

2. **Start slowly with realistic goals and pick very "low-hanging fruits," which will help decompress clinics by taking smaller issues off of face-to-face visits and open up slots for much-complicated issues thus reducing wait times for new patients; and**

3. **Modernize medical record systems.**

"A unified platform for care coordination is an important means to this type of healthcare delivery as very few specialty care services are data-driven like endocrinology," she says. "Thus, if we were to be confident of our care processes and successful in creating newer models, we will need to have unhindered access to complete medical records, investments in virtual care delivery technologies, and a renewed look at reimbursement models for non-traditional care delivery."

> **"E-consults have a huge role to play in addressing the shortage of specialty care,** improving timely access to quality care, and addressing the chronic problem of poor care of diabetes, especially where there is a shortage of providers."
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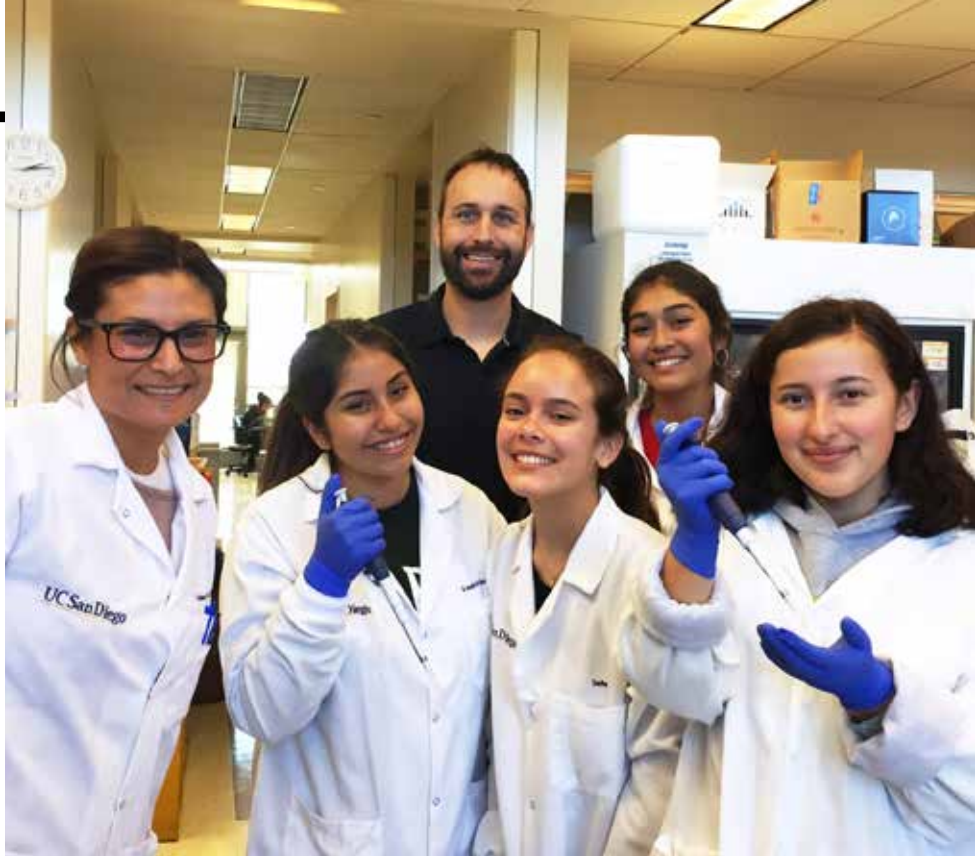
> — ARCHANA BANDI, MD, CLINICAL DIRECTOR OF TELEHEALTH SERVICES, VA PITTSBURGH HEALTHCARE SYSTEM

Indeed, adopting these models will take some time and a lot of effort, and with diabetes and obesity rates continuing to climb, the shortage of endocrinologists will probably not be addressed any time soon. But more telehealth technologies are emerging, and Bandi is optimistic. "With the availability of modern care delivery technologies," she says, "we can once again take care of the patients closer to home, and possibly at home, as we did in past." EN

BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. HE WROTE ABOUT THE ENDO 2018 PLENARY SESSION, "ENDOCRINOLOGY OF THE TONGUE," IN THE MARCH ISSUE.

In Alexander Kauffman's lab at UCSD, there are a few fresh faces behind the goggles. His lab is recruiting high school students as interns to contribute "new perspectives and fearless solutions" to the traditional laboratory environment, not to mention inspiring a new generation of scientists.

BY GLENDA FAUNTLEROY



Alexander Kauffman (back) and his lab member Adriana Esparza (left) training high school students in lab techniques.

New Kids at the Bench

"So whether it's running gels, isolating DNA, processing brain tissue onto slides, or staining for different mRNAs on brain tissue, they are getting invaluable hands-on research experience."

Look around the laboratory of Alexander (Sasha) Kauffman, PhD, in the Department of Reproductive Medicine at the University of California San Diego (UCSD), and you'll see a team of researchers working hard to unlock the secrets of puberty. A closer look will show that some of the researchers are barely old enough to have a driver's license. These young scientists-to-be are high school interns enjoying an experience with long-lasting impact.

The interns are juniors from High Tech High Chula Vista in south San Diego — a public charter school where juniors spend the month of May in full-time internships in their desired area of interest. For the past four years, several students have thrived in Kauffman's "High Tech High Science Outreach Program," and he hopes the idea can spread to include more opportunities for youth in underrepresented communities around the country.

Nuvia C. Ruland is High Tech's 11th grade biology/environmental science teacher and an alum of UCSD. While pursuing her science degree, she says her internship in a biochemistry lab was life changing.

"Being a Latina in science at UCSD could be very isolating, but having a supportive mentor gave me the safe space to grow as a scientist and person," Ruland recalls. "I'm forever in debt to my high school and undergrad mentors, and I'm dedicated to pass on my passion for scientific research to my students."

Ruland's desire to give her students the same opportunity came to fruition when she met Kauffman, who she says jumped at the chance to partner in an internship program.

Each year, Kauffman first visits Ruland's class to lecture about his research. A few weeks later, the entire class visits Kauffman's lab at UCSD for a full-day of direct exposure to multiple research techniques. Interested students then send a cover letter and resume from which he selects several to interview. Kauffman chooses two student interns who join his lab with 40-hour work weeks — many of the students spending hours of commute time on public transportation traveling the 35 miles from their homes in Chula Vista to UCSD.

"The vast majority of the interns have been underrepresented minorities, either ethnic minorities or students from low-income families or a combination of both," Kauffman says. "One of the goals that both Nuvia and I have is to increase participation of these underrepresented minorities in science and research."

Kauffman has been involved in several outreach programs through UCSD, but says High Tech High provides the most intensive, substantial experience for the students.

"They are being trained in a whole suite of different techniques and methodologies, and they're actually mastering many of these techniques while also coming to appreciate why we do the techniques in the first place," Kauffman says. "So whether it's running gels, isolating DNA, processing brain tissue onto slides, or staining for different mRNAs on brain tissue, they are getting invaluable hands-on research experience."

"The Whole Experience Is Invaluable"

For Nicole Mendez, now a second-year student at UCSD, interviewing for Kauffman's internship was a "nerve-wracking experience." Her class was the first to intern in his lab.

"There was a lot of pressure to do well, not just for my own sake but for the sake of preserving this opportunity for students that came after me," Mendez says.

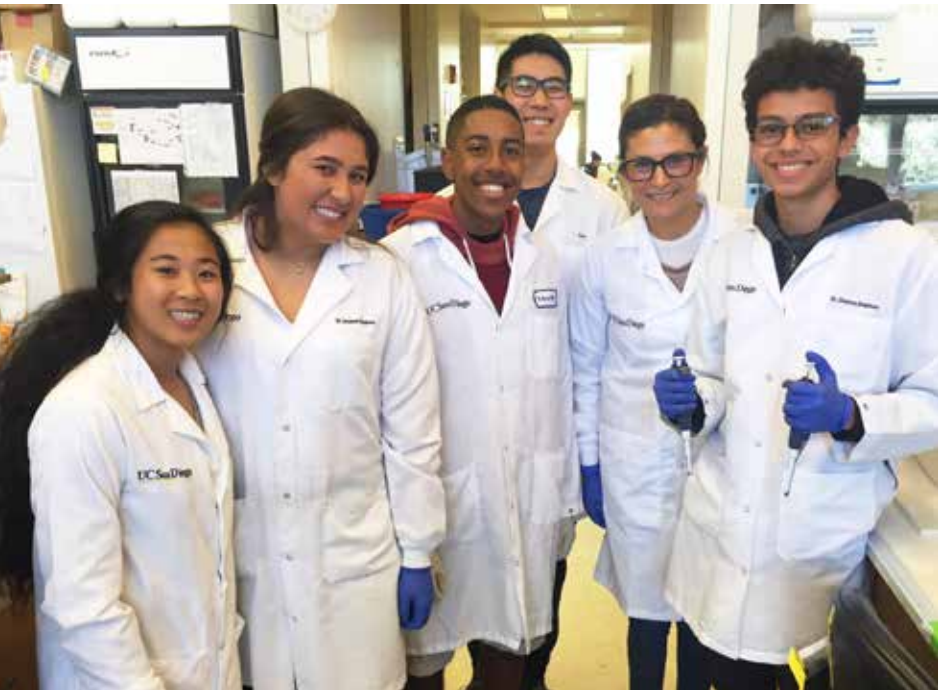
Despite switching her college major from ecology to media, she says she owes a lot to the internship.

A few weeks later, the entire class visits Kauffman's lab at UCSD for a full day of direct exposure to multiple research techniques.

> **"I'm forever in debt to my high school and undergrad mentors, and I'm dedicated to pass on my passion for scientific research to my students."**

"It was really an eye opener in helping me realize what my strengths were career-wise," she says. "Majoring in media… may seem like a big leap from an internship at Dr. Kauffman's lab but the overall ideas and experiences still motivate me."

"The way we constantly glean new discoveries and how similar we all are within the endocrine system and in the way we develop are some concepts that have shaped the way I approach the world," Mendez continues. "I appreciate just how similar we all are despite the different paths we take."



High Tech High students and Kauffman Lab members during a full-day lab visit. Cayla Maltman (second from left) was selected to do a four-week internship in the Kauffman lab later this year.

The same holds true for former intern Ethan Powers, now a freshman at San Diego State University. Powers is majoring in computer science with a minor in neurosciences and says the internship in Kauffman's lab helped him choose his direct path.

"We talked about the importance of neuroscience research and its implementations to the biomedical field," he says. "Dr. Kauffman encouraged me to continue my appreciation for both neurosciences and computer sciences and how both can develop further advances in neuroscience research. The whole experience is invaluable, and I want to express much gratitude to Dr. Kauffman for taking his time to encourage and mentor me."

Fearless Solutions

Kauffman and Ruland hope to recruit neighboring research labs at UCSD to sponsor more High Tech interns. So far two others have expressed interest.

"Being a high school mentor at a research institution is very challenging because of the liability of having minors in the lab," Ruland says. "But Dr. Kauffman, as did my mentors, knows that getting youth excited in science comes through providing authentic hands-on experiences and believing in the capacity of their adolescent brain. Youth will contribute to a lab with new perspectives, questions, and fearless solutions. Having young minds in a lab is really an asset to both all those involved and the science itself."

Kauffman acknowledges most high schools can't offer the schedule flexibility of a four-week internship but urges there are other ways to outreach.

"Researchers could implement a summer program or an after-school program for an hour or two. Even one week would be a really valuable opportunity." EN

FAUNTLEROY IS A FREELANCE HEALTH WRITER BASED IN CARMEL, IND. SHE'S A REGULAR CONTRIBUTOR TO *ENDOCRINE NEWS*.

CLINICAL PRACTICE GUIDELINES
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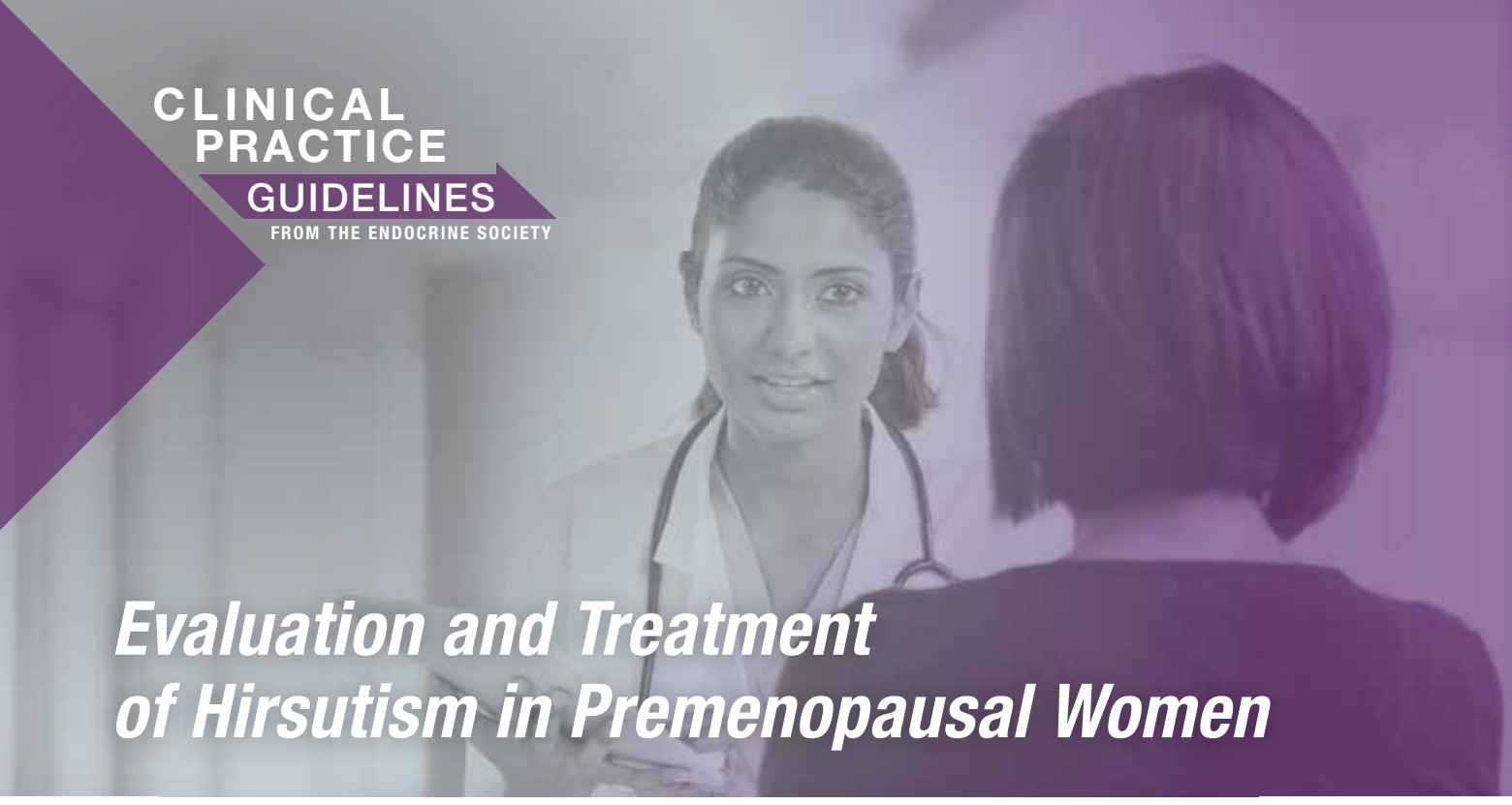

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EDCs in the EU: Endocrine Society Advances Priorities Following Adoption of Criteria

As reported previously in *Endocrine News*, this past summer the European Union (EU) adopted new criteria for the identification of endocrine-disrupting chemicals (EDCs) governed by EU biocides and pesticides laws. The Endocrine Society has been a vocal champion of policies and regulations designed to protect public health from harms due to EDC exposure, and our members were highly influential in the development of the criteria. Members met with policymakers in the EU, participated in briefings at the European Parliament, and held meetings with European Commission staff to ensure that policymakers heard the latest EDC science and how it was relevant to the criteria. However, passage of the criteria was only an initial step in the regulatory process, and policymakers and regulators continue to call upon Endocrine Society members to provide advice and guidance on this important subject.

Following adoption of the criteria, the European Commission requested that the European Food Safety Agency (EFSA) and European Chemicals Agency (ECHA) develop a guidance document for implementing new criteria for regulating EDCs. The Endocrine Society submitted comments during a public consultation on the draft guidance, noting several concerns with the guidance that need to be addressed to ensure EDCs posing a risk to public health can be identified. Specifically, we asked that EFSA and ECHA ensure that agencies are able to identify chemicals using well-established systematic review methodologies, and we expressed reservations about the use of adverse outcome pathways (AOPs) in identification strategies. We also called on EFSA and ECHA to plan to expand the scope of the guidance to cover additional hormone pathways other than androgen, estrogen, thyroid, and steroidogenesis. The final guidance document will be released in June 2018.

While agencies work toward applying the new criteria to biocides and pesticides, the European Commission called for the development of a new strategy to minimize exposure of EU citizens to EDCs in other consumer products, such as toys, cosmetics, and food packaging materials. Additionally, the Commission aims to support new research projects on EDCs through the next Horizon 2020 work program, budgeting

approximately €50 million. These developments reflect the increased attention to EDCs and high prioritization of this issue among some member state governments.

The Endocrine Society enthusiastically supports the development of a new strategy on EDCs that results in more comprehensive public health protection from EDCs and appreciates the additional research funds for addressing gaps in knowledge. On May 24, Endocrine Society member Barbara Demeneix, PhD, DSc, will participate in a briefing organized by MEP Pavel Poc about EDC priorities and next steps for policymakers. The Endocrine Society will also meet with EU policymakers to share our updated Position Statement on EDCs in the EU, which includes high-priority research topics identified in the Society's second Scientific Statement on EDCs.

Meanwhile, in the U.S., the Core Study from the Consortium Linking Academic and Regulatory Insights on BPA Toxicity (CLARITY-BPA) was released by the National Toxicology Program (NTP) in February. Regulators in the EU are closely watching the CLARITY-BPA project and will make use of the findings from the final report in their own evaluation of BPA safety. The Endocrine Society submitted comments on the research report, highlighting technical elements that deserve close scrutiny during peer review and urging agencies to avoid making safety determinations based on incomplete study results. Our comments will be shared with the NTP panel in advance of the April 26 peer-review meeting for the Core Study. In the coming months, the Core Study will be integrated with external grantee studies investigating additional highly sensitive endpoints toward the preparation of a final report on BPA-related health outcomes.

"The Endocrine Society enthusiastically supports the development of a new strategy on EDCs that results in more comprehensive public health protection from EDCs and appreciates the additional research funds for addressing gaps in knowledge."

Public health groups and organizations are paying close attention to CLARITY-BPA, given the global regulatory interest in bisphenols. In addition to BPA, there are a class of closely related bisphenol chemicals that emerging research shows may have similar health hazards to BPA. CHEM Trust, a UK-based organization with the goal of preventing damage to humans and wildlife from chemical exposures, recently published a report highlighting the danger of replacing BPA with chemical analogues with similar safety profiles. For more information about the report, please see the CHEM Trust website at **www.chemtrust.org/toxicsoup.**

PATH Sets Path Forward to Increase Use of Standardized Hormone Assays

On April 12, the Endocrine Society hosted the Steering Committee of the Partnership for the Accurate Testing of Hormones (PATH) to strategize about how to increase standardization of hormone assays. Standardization of hormone assays is important because although hormone assays are widely used by physicians, some current hormone tests are not sufficiently accurate or reliable, which makes diagnosis and management of disease difficult.

For example, two laboratories using different tests to measure the same hormone level could get significantly different results for the same patient using the same sample. Inaccurate test results can lead to misdiagnoses and treatment and increased expense. Consequently, patients can suffer unnecessary and avoidable repeated tests and potential disease complications, fail to be treated appropriately, or undergo unnecessary treatment. Accurate hormone assays will lead to fewer medical errors, eliminate the need for costly repeat testing, and reduce unnecessary healthcare costs.

Members of the PATH Steering Committee: Front row from left to right: Xiaochun Helen Zhang (Siemens Healthineers), Marianela Perez-Torres (FDA), Christina Wang (IAS), Esther Eisenberg (NICHD), Al Matsumoto (ASBMR), Leslie Best (NACDD), Alicia Algeciras-Schimnich (ATA), and Ronald Whitley (AACC). Back row from left to right: Darius Paduch (AUA), Robert Fitzgerald (AACC), Walt Chandler (LabCorp), Luigi Garibaldi (PES), John Robitshcer (NACDD), Alex Katayev (LABCorp), Hubert Vesper (CDC), Doug Fesler (ASBMR), Bob Rej (APHL), and Jack Fuqua (PES).

In addition, inaccurate tests used in medical research make research findings uncertain and not repeatable. This makes it impossible for clinical practitioners to use research findings to make evidence-based clinical decisions. A result of non-standardized hormone assays is that criteria used to diagnose patients differ depending on which test is being used, leading to inconsistent patient care.

Furthermore, there is a general lack of awareness among physicians and other healthcare professionals about the poor quality of some hormone assays and its consequences.

During its meeting, PATH Steering Committee members set goals for the future, including:

1. **Standardization** – To increase the number of hormone assays that are standardized.
2. **Education** – To increase knowledge of healthcare providers, researchers, administrators, policymakers, and payers about the importance of accurate and reliable hormone assays and assay quality in patient care, research, and public health.
3. **Implementation** – To increase the use of standardized assays in patient care, public health, and research.
4. **Sustainability** – To establish a sustainable system to standardize hormone assays and to keep hormone assays accurate and reliable.

Top priorities for this year will be for PATH to launch a revised website to inform the public about the importance of accurate and reliable (standardized) lab tests; to conduct an educational briefing for policymakers to promote use of standardized tests in patient care and research; and to provide technical support to the CDC to develop analytical performance criteria, reference ranges, and other data to support standardization.

The Endocrine Society established PATH in 2010 to address the need for better hormone tests for use in healthcare and research to improve patient care. PATH currently comprises 20 clinical, medical, and public health organizations. It provides technical and scientific support to the CDC Steroid Hormone Standardization Program, including identifying high-priority hormones in need for standardization. It conducts educational activities on hormone measurements for physicians and other healthcare providers and advocates for the universal use of standardized hormone tests.

PATH has had many successes, including:

- Obtaining FY 2018 Appropriations Report Language supporting the CDC Hormone Standardization program;
- Developing performance standards for testosterone assays used in research and patient care published in *The Journal of Clinical Endocrinology & Metabolism* (JCEM) and *Clinical Chemistry*;
- Creating broad awareness about the importance of accurate hormone testing as reflected in a white paper by the American Urological Association and in presentations and posters at meetings of PATH member organizations;
- Generating consensus reference ranges for testosterone and publishing in JCEM;
- Conducting activities to improve estradiol testing and a workshop on estradiol testing;
- Including vitamin D and thyroid hormones in standardization efforts by the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) on thyroid testing; and
- Receiving the "Excellence in Partnering" award from the CDC National Center for Environmental Health/Agency for Toxic Substances and Disease Registry in 2016.

The Endocrine Society is very encouraged about the progress PATH is making toward standardization of hormone assays. Members interested in participating in PATH activities should contact *govt-prof@endocrine.org*. Additional information about the CDC Standardization Programs can be found at *cdc.gov/labstandards*. EN

CLINICAL PRACTICE GUIDELINES
FROM THE ENDOCRINE SOCIETY

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Endocrinologist Opportunity

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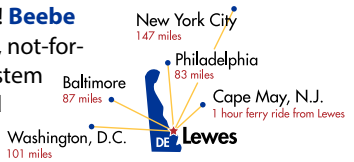

One main hospital location in Lewes, with additional surgery center and outpatient campuses around Southern Delaware. A short drive from major East Coast destinations.

About the Endocrinologist Opportunity:

- Endocrinologist BC/BE
- Excellent opportunity working with an established practice and Beebe's Diabetes Management Dept.
- Employed within Beebe Medical Group, a multi-specialty hospital network
- Competitive salary with generous benefits package
- This position offers operational support so you can focus on medicine

About Beebe Healthcare:

- Repeatedly recognized with national awards
- Progressive and growing quickly, with high patient satisfaction, and quality of care
- Cardiac surgery, interventional cardiology, cancer center with radiation, 256-slice CT, 3.0T MRI, PET Scan, 3D mammography, and hyperbaric chambers
- 375+ providers on staff; 48,000+ Emergency visits
- Margaret H. Rollins School of Nursing

About the area:

- Nationally ranked family-oriented beaches and boardwalks by *Parents Magazine, National Geographic, Travel and Leisure,* and *American Profiles*
- Exceptional quality of life and the environment is smart, progressive and safe
- Public and private school options
- Low taxes and no sales tax; low cost of living
- Close to Philadelphia, Baltimore, DC, and NYC

Beebe Healthcare

Email cover letter and CV to Marilyn Hill, Director of Physician Services, mhill@beebehealthcare.org • www.beebehealthcare.org
c/o Beebe Medical Group Administration • 1515 Savannah Road, Suite 102 • Lewes, DE 19958
This is not visa sponsored opportunity.
Beebe Healthcare is a non-smoking and fragrance free system.

Join a dynamic and growing Division of Endocrinology in the Department of Medicine, Emory Healthcare. Practice in one of the largest and most comprehensive health systems in Georgia!

Qualified applicants are board certified/board eligible in Endocrinology who possess outstanding clinical, technical and interpersonal skills and training from top-rated institutions. Physicians with Emory Healthcare enjoy competitive salaries and excellent benefits packages. Apply now!

Please, visit:
https://faculty-emory.icims.com/jobs/17785/job

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Daniel Simone | 212•904•0360
dsimone@pminy.com

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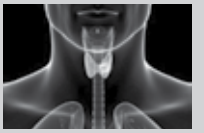
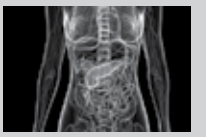
CURRICULUM HIGHLIGHTS:
- Assess risks and benefits of standard and emerging treatments of endocrine disorders
- Learn new approaches to diagnose endocrine diseases
- Board Review Q&A and interactive discussion of selected case studies
- Developed and taught by leading endocrinologists in each focus
- **Up to 37 Continuing Medical Education Credits!**

TARGET AUDIENCE:
- Endocrinologists wishing to remain abreast of advances in the field or seeking recertification
- Anyone preparing for the board certification exam.



EARLY REGISTRATION FEES:
$1,095 General Rate
$895 NIH Medical Professionals
$595 Fellows

SPEAKERS INCLUDE:
- Dr. Beverly Biller, Harvard Medical School
- Dr. Electron Kebebew, NCI/NIH
- Dr. R. Michael Tuttle, Memorial Sloan-Kettering Cancer Center
- Dr. Joseph Verbalis, Georgetown University
- Dr. Lee Weinstein, NIDDK/NIH



National Institutes of Health | Email: registration@faes.org | Phone: (301) 496-7977

Accreditation: This live activity has been planned and implemented in accordance with the Essential Areas and policies of the Accreditation Council for Continuing Medical Education through the joint sponsorship of The George Washington University School of Medicine and Health Sciences and the Foundation for Advanced Education in the Sciences (FAES). The George Washington University School of Medicine and Health Sciences is accredited by the ACCME to provide continuing medical education for physicians.

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ENDOCRINE SOCIETY

Patients Have Questions.
We Have Answers.

Hormone Health NETWORK®
FROM THE ENDOCRINE SOCIETY

HORMONE.ORG IS THE TOP ENDOCRINE PATIENT EDUCATION RESOURCE!

150+ time-saving free patient resources covering a comprehensive list of endocrine-related diseases and conditions.

- Q&A Fact Sheets (also available in assorted languages)
- Patient Guides
- Infographics
- 3D Patient Education App
- Educational Videos
- Patient-centric Newsletters

Our resources are backed by the clinical and scientific expertise of 18,000+ members of the Endocrine Society

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