RESEARCHERS ROUNDTABLE: THE 2021 EARLY INVESTIGATOR AWARD WINNERS

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THE LEADING MAGAZINE FOR

ENDOCRINOLOGISTS

INTERNATIONAL

END=2021 REVIEW

JUNE 2021

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Obesity is associated with more severe COVID-19 effects and ICU stays but not with increased mortality.

- Hyperglycemia is linked to a higher risk of death in COVID-19 patients both with and without diabetes.
- Children with adrenal insufficiency and COVID-19 have a significantly higher risk of complications, mortality rate, endotracheal intubation, and sepsis.
- Patients with low vitamin D levels were less likely to be ventilated or to die from COVID-19.

PEER REVIEW:

A professional partnership examines CVD and diabetes

TOUTING TEAMWORK:

Inpatient Diabetes Management Service's impact in community hospitals



Hormone Science to Health



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ENDOCRINE SOCIETY



Showcasing Our Commitment to Diversity, Equity, and Inclusion

Recognizing our diverse global membership as our strength and an asset has been key to building a professional home for all in the endocrinology community. I'd like to take this opportunity to highlight some of the outstanding initiatives created to continue the vital and innovative work of our members to cultivate and support a more diverse and inclusive environment.

This year's annual meeting featured informative sessions addressing the importance of reducing and ultimately eliminating endocrine-related health disparities and improve healthcare for all. **ENDO 2021** featured three scientific sessions that focused on health disparities and the impact of bias on health outcomes:

- The highly popular Clark T. Sawin Memorial History of Endocrinology Lecture titled, "Lessons Learned from the History of Identifying and Addressing Health Disparities in Endocrinology and Diabetes," which provided a broad historical perspective on the emergence of research showing dramatic racial and ethnic disparities and factors that help improve health indicators and potentially close the gap between racial and ethnic groups;
- "Addressing the Impact of Structural Racism on Endocrinology and Health Care" — a session tackling structural and institutional racism, how these issues have led to social determinants of health that contribute to risk of endocrine disorders, and strategies to address social determinants of health into clinical and population health models; and
- "How Do We Confront Disparities in Obesity and COVID-19 Treatment" a look at the physiological, clinical, social, and behavioral aspects of disparities in obesity and obesity treatment.

We have worked to develop and implement new strategies to incorporate diversity, equity, and inclusion into all of our activities and to address endocrine health disparities over the past few years. The inaugural Diversity, Equity, and Inclusion Town Hall virtual meeting held on April 14 was a starting place for members of our committees to engage in dialogue that catalyzes action across all core areas of the organization. More than 70 committee members joined the conversation on identifying ways to work together to ensure our vision of diverse representation, equitable access to education, and inclusive leadership within endocrine science and medicine is realized.

As part of our commitment to diversity, equity, and inclusion, we felt the need to revisit our decision to hold **ENDO 2022** in Atlanta, Ga., after the state passed a recent voting law that disproportionately places voter restrictions on minority communities.

After careful research and consultation with Atlanta Mayor Keisha Lance Bottoms, U.S. Senators Jon Ossoff and Reverend Raphael Warnock, and Dr. Bernice A. King, CEO of the King Center, and daughter of Dr. Martin Luther King, Jr., we learned our departure from Atlanta would create economic hardships for the very minority communities we want to support. We are now exploring opportunities to demonstrate that commitment during **ENDO 2022** from June 11 – 14, 2022, including the possibility of holding an ENDO Cares program to provide medical resources, coaching, and education to local patients and healthcare providers in the Atlanta area.

We are weaving messages about the importance of diversity, equity, and inclusion into our advocacy work:

- We raise the issue every time we discuss access to healthcare;
- We support inclusion policies at the National Institutes of Health (NIH) and provided recommendations for the NIH UNITE program;
- Our Advocacy & Public Outreach Committee and Committee on Diversity and Inclusion have partnered to develop a policy perspective on combatting disparities and to respond to the Biden administration's equity initiative;
- We discuss the impact of unaffordable prescription medications on minority populations;
- We highlight the impact of diabetes and obesity on minority populations and the need for additional research to better understand the impact of COVID-19 on these groups; and
- We have led efforts to expand and implement the NIH's sex as a biological variable and inclusion policies.

We are playing a key role in supporting the next generation of endocrine scientists from underrepresented minority communities. Our Future Leaders Advancing Research in Endocrinology (FLARE) program welcomed a new cohort of 11 talented fellows at its leadership workshop held online April 27 – 30. Fellows selected for the FLARE class of 2021 are a balanced mix of senior graduate students, postdoctoral and clinical fellows, and junior faculty. The goal of FLARE is to provide early-career scientists from underrepresented minority communities the skills to achieve successful, rewarding careers in endocrine research. Our first FLARE virtual workshop focused on the importance and impact of building your network, effectively communicating your science, building effective research collaborations, negotiating the right position, and much more. The leadership development that occurs during FLARE is often transformative and is an example of how our Society has created meaningful change around improving diversity in the



We have worked to develop and implement new strategies to incorporate diversity, equity, and inclusion into all of our activities and to address endocrine health disparities over the past few years.



field. Over the nine years of its existence, 161 fellows have participated in the FLARE program. The newest group of fellows are looking forward to their highly anticipated oneyear committee internship placements, and we look forward to having them contribute to the work of our committees.

In the coming months, we will explore a new opportunity to provide leadership development training to clinical fellows from minority groups underrepresented in science and medicine. The Excellence in Clinical Endocrinology Leadership (ExCEL) program is a comprehensive initiative that will offer fellows a pathway to develop their leadership abilities, gain guidance and coaching from dedicated Society mentors, and participate in career-building service opportunities through various Society activities.

These are just a few of the collective initiatives that position us to make a difference and move us toward more equitable and inclusive outcomes for our members and the communities in which we live. Stay tuned to learn more about our upcoming programs and services.

Carol H. Wysham, MD President, Endocrine Society

No Place Like Work Home

eventeen voicemails, 14 boxes of *Endocrine News*, and a Costa Coffee tumbler bought in London in 2019 that was in dire need of a good scrubbing.

That's what awaited me when I returned to my office at the Endocrine Society headquarters in Washington, D.C., for the first time since March 13, 2020. Honestly, it was good to be back in the office. There was a mix of trepidation and excitement...much like the first day of school. The Metro was eerily empty. So was D.C., as I passed restaurant after restaurant that had shuttered its doors for good. Even my favorite Starbucks was closed, albeit temporarily. Once I started working using my twin monitors, the change from staring at my laptop was jarring but in a welcomed, comforting way. It was good to be back in my work home.

Home is one of the terms I've heard many of you say through the years when referring to the Endocrine Society as your "professional home," and that makes perfect sense. As many of you have embarked on your training, through your early-career efforts, and onward as you work to establish yourselves professionally, the Endocrine Society has been a source for professional advancement as well as personal relationships. With each issue of *Endocrine News*, we try to highlight both of these components as we bring you the latest endocrine research while also providing both clinicians and researchers with tips and tools of the trade in the hopes of making your own work home a better place.

On page 26, you'll see five of our early-career researchers highlighted in "Researchers Roundtable," where the winners of the Endocrine Society's





THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

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Prepress & Printing: The Sheridan Group www.sheridan.com

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

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

Print ISSN 2157-2089 Online ISSN 2157-2097 Copyright © 2021 by the Endocrine Society. All rights reserved.

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Early Investigator Awards spoke to Glenda Fauntleroy Shaw about how they got to where they are now. Each of them discusses their research, what this award means for them, their own personal issues in dealing with the COVID-19 pandemic, as well as their future research plans. One of the winners, Manuel D. Gahete, PhD, from the University of Córdoba, in Andalusia, Spain, says that this award is not only an important milestone in his career, but it will serve to support his ongoing research, adding that it "boosts my enthusiasm and dedication to continue with research in the endocrinology field," he tells us. "It will contribute to visualize the support and recognition of one of the most relevant societies in the field to the research I have developed during the earliest stages of my career, which will help to consolidate my emerging position within the endocrine field."

Endocrine research is also the focus of "Collision Courses" on page 32 as Kelly Horvath discusses the studies presented at **ENDO 2021** that dealt with endocrine comorbidities and how they were affected by COVID-19. These studies looked at the virus' impact on patients with obesity, hyperglycemia, adrenal insufficiency, as well as a lack of vitamin D. These studies are just a portion of our **ENDO 2021** wrap up that also includes a Q&A with Hydeline B. Dominguez, MD, the first winner of the Endocrine Society's C. Wayne Bardin International Travel Award, as well as testimonials from attendees who were able to attend from around the world.

Keep in mind that this will not be the last time *Endocrine News* features research presented at **ENDO 2021**; there was so much groundbreaking science presented at this year's first-ever all-virtual annual conference that we will have more articles highlighting these studies in upcoming issues.

If you have any ideas or suggestions for stories you'd like to see in *Endocrine News*, feel free to contact me at: **mnewman@ endocrine.org.**

- Mark A. Newman, Editor, Endocrine News



JUNE 11-14, 2022 ATLANTA, GEORGIA SAVE THE DATE ENDOCRINE.ORG/ENDO2022

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Endocrine Society Names New Editors-in-Chief of Endocrine Reviews, Journal of the Endocrine Society



Ashley Grossman MD, FRCP



Zeynep Madak-Erdogan, PhD

The Endocrine Society appointed two new editors-in-chief of its prestigious journals. Ashley Grossman MD, FRCP, of Barts and the London School of Medicine in London, U.K., has been named the next editor-in-chief of *Endocrine Reviews*, and Zeynep Madak-Erdogan, PhD, of the University of Illinois at Urbana-Champaign in Urbana, Ill., has been named editor-in-chief of the *Journal of the Endocrine Society* (JES).

"This is a very exciting time for our Society as we introduce two new editors-in-chief who are more than qualified to carry our journals forward in impact and growth," says Endocrine Society President Carol Wysham, MD, of the Rockwood/MultiCare Health Systems in Spokane, Wash. "Drs.



This is a very exciting time for our Society as we introduce two new editors-in-chief who are more than qualified to carry our journals forward in impact and growth.



Grossman and Madak-Erdogan both have extensive journal experience and have brought forward great energy and creative ideas for advancing our journals."

Grossman is an emeritus professor of endocrinology at the University of Oxford and professor of neuroendocrinology at the University of London in the U.K. who has trained many leading endocrinologists. He won a 2020 Endocrine Society Laureate Award for his outstanding mentorship. His research focus is the pathogenesis of endocrine tumors, including adrenal, pituitary, and neuroendocrine tumors.

"My vision for *Endocrine Reviews* is for all articles to reflect the most exciting and novel aspects of basic medical science and to be intertwined with their impact on clinical medicine and patient care," Grossman says. "The fusion of basic knowledge with an understanding of its clinical relevance is one of the most intriguing and challenging areas of medicine. *Endocrine Reviews* is ideally situated to respond to that challenge and be in the forefront of translational medicine."

Endocrine Reviews publishes bimonthly, including concise timely reviews updating key mechanistic and clinical concepts, as well as more comprehensive, authoritative review articles spanning both experimental and clinical endocrinology themes. *Endocrine Reviews* considers topics that inform clinical practice based on emerging and established evidence from clinical research as well as reviews of advances in endocrine science emanating from studies of cell biology, immunology, pharmacology, genetics, molecular biology, neuroscience, reproductive medicine, and pediatric endocrinology.

Madak-Erdogan is an assistant professor of nutrition and director of the Women's Health and Metabolism lab at the University of Illinois, Urbana Champaign. Her lab focuses on understanding how hormones and metabolism affect women's health. Her research centers around using animal and 3D-engineered models, and advanced statistical and computational analysis to understand how nutrients, environmental toxicant exposures, and hormones impact metabolic health and hormone-dependent cancer outcomes.

"As editor-in-chief, I'll advance JES' reputation as an Open Access publication and maintain the journal's scientific and literary quality," Madak-Erdogan says. "We will reach even more clinicians and basic scientists worldwide with the journal's innovative research on all areas of endocrinology."

Journal of the Endocrine Society is an Open Access journal providing rapid publication of clinical research, clinical practice information, and basic research in all areas of endocrinology. Mini-reviews, commentaries, perspectives, case reports, and articles about images, databases, and methods are also featured. Articles undergo a streamlined peer review and are provided with article-level metrics.

Grossman and Madak-Erdogan will each serve three-year terms starting January 1, 2022.

Society Members Elected to National Academy of Sciences



Holtz ndocrine Society members Holly Ingraham, MD, Daniel Drucker, MD, and Laurinda A. Jaffe, PhD, have been elected to the National Academy of Sciences (NAS), which recognizes achievement in science and provides science, engineering, and health policy advice to the federal government and other organizations.

This year, NAS elected 120 members — 59 of whom are women, the most elected in a single year — and 30 international members in recognition of their distinguished and continuing achievements in original research. "The historic number of women elected this year reflects the critical contributions that they are making in many fields of science, as well as a concerted effort by our Academy to recognize those contributions and the essential value of increasing diversity in our ranks," according to NAS president Marcia McNutt. "I am pleased to welcome all of our new members, and I look forward to engaging with them in the work of the National Academies."

Ingraham is the Hertzstein Distinguished Investigator, professor, and associate vice chairman, Department of Cellular and Molecular Pharmacology at the University of California — San Francisco, Calif., and studies hormone-responsive nodes in the brain and is particularly interested in estrogen's signaling in the brain and how this impacts female metabolism. She has studied the influence of estrogen-sensitive brain cells on bone density and is interested in the development of the ventromedial nucleus of the hypothalamus, the neuroendocrine center of the brain. Beyond the brain, Ingraham has studied sex-specific differences in gut-brain signaling pathways, in an effort to understand why women are more susceptible to intestinal visceral pain syndromes.

Jaffe, professor and chair in the Department of Cell Biology at the University of Connecticut Health Center in Farmington, studies the physiological mechanisms that regulate oocyte cell and fertilization. She is interested in the meiosis process that takes place in mammalian ovarian follicles. She identified the proteins (Gs protein) and receptors (GPR3) that are responsible for meiotic prophase arrests and has studied the processes that give rise to the fibroblast growth factor (FGF)-induced inhibition of bone growth.

Drucker, editor-in-chief of *Endocrine Reviews*, is currently a professor of medicine at the Lunenfeld Tanenbaum Research Institute of Mt. Sinai Hospital and the University of Toronto in Toronto, Canada. Drucker's laboratory studies the molecular biology and physiology of gut hormones, with a focus on the glucagon-like peptides. Drucker's scientific studies have identified multiple novel mechanisms of hormone action, enabling the development of new drug classes for diabetes, obesity, and intestinal failure.

Endocrine Society Debuts a New Behind-the-Scenes Blog

The Endocrine Society recently launched a new membership blog to give readers a look at the innerworkings of your organization. *Endocrine Signals* features an inside look at the latest news, views, announcements, occasional musings, and other behind-the-scenes activities of the Society.

To kick the monthly blog posts off, Robert Lash, MD, chief professional and clinical affairs officer at the Endocrine Society, wrote about member value in a

SIGNALS

changing environment, reflecting on 2020 and looking ahead to the future, in a blog post published just a week before ENDO 2021. Of course, ENDO 2021 was a success, but as Lash writes, we want to continue to bring compelling programs and opportunities to our members throughout the year. "Bringing you that member value is at the core of everything we do," he

writes. "And it underlies three of our 2021 strategic priorities: diversity and inclusion, digital education and virtual engagement, and global leadership."

Part of that virtual engagement comes in the form of the relatively new Special Interest Groups (SIGs) and the Society's Community Connect open forum. As Courtney Neal, associate director of membership, and Claudia Barrett, specialist of member engagement and recognition, explain in April's post, these communities allow members worldwide to share their knowledge, talk with peers, ask questions of experts, attend learning events, and forge deep and lasting professional relationships. Neal and Barrett point to some of their most recent discussions like physicians' motivations for being in the pharmaceutical industry and Arkansas's transgender bill, writing, "As you can see, we don't shy away from controversial topics. Community Connect is a safe place to share ideas and opinions on all sorts of related topics, while adhering to our respectful engagement guidelines."

Indeed, the Society has never shied away from controversy, especially if that meant advocating for patients. In May's *Endocrine Signals* post, Grace Kranstover, manager of government and public affairs, writes about the Society's efforts to advocate for women's health, including cohosting a congressional briefing titled "Women's Health Research: Understanding the Roles of Sex and Gender" and addressing knowledge gaps in sex differences, which prevents researchers from truly understanding the impact biological sex has on research outcomes.

Endocrine Signals is updated monthly, so be sure to visit to learn more about what goes on behind the scenes at 2055 L Street and beyond. Check it out at: www.endocrine.org/news-and-advocacy/blog-endocrine-signals.

Endocrine Signals features an inside look at the latest news, views, announcements, occasional musings, and other behind-thescenes activities of the Society.

TRENDS & INSIGHTS



Machine-Learning Model Improves Acromegaly Management

achine learning (ML), a type of artificial intelligence, could be used to predict how patients with acromegaly respond to first-generation somatostatin receptor ligands (fg-SRLs), according to a study recently published in *The Journal of Clinical Endocrinology* & Metabolism.

Researchers led by Mônica Gadelha, MD, PhD, of the Endocrine Unit and Neuroendocrinology Research Center at the Medical School and Hospital Universitário Clementino Fraga Filho - Universidade Federal do Rio de Janeiro, in Rio de Janeiro, Brazil, point out that fg-SRLs are the mainstay of acromegaly medical treatment, but control rates are about 40%. "Diverse factors have been investigated as possible biomarkers of biochemical response/control to fg-SRL in acromegaly," the authors write. "Mostly, they have been individually evaluated in small series. The combined use of different biomarkers enhances their accuracy to predict biochemical response to fg-SRL. Artificial intelligence (AI), more specifically machine learning (ML), is a useful tool to study the impact of different biomarkers on the therapeutic response simultaneously and to design accurate prediction models."

For this study, the researchers included 153 patients with acromegaly from 16 Brazilian reference centers who had not been cured by primary surgical treatment and who had adjuvant therapy with fg-SRL for at least six months. The team evaluated six AI models, randomly splitting patient data into training and test sets (4:1 ratio) until there was no significant difference between features from both sets. These models included logistic regression, k-nearest neighbor classifier, support vector machine, gradient-boosted classifier, random forest, and multilayer perceptron. "The features included in the analysis

were age at diagnosis, sex, GH and IGF-I levels at diagnosis and at pretreatment, somatostatin receptor subtype 2 and 5 (SST2 and SST5) protein expression and cytokeratin granulation pattern (GP)," the authors write.

The researchers found that the model that performed best was the support vector machine with the features SST2, SST5, GP, sex, age, and pretreatment GH and IGF-I levels. It had an accuracy of 86.3%, positive predictive value of 83.3%, and negative predictive value of 87.5%. "In conclusion," the authors write, "we developed an ML-based prediction model with high accuracy using biomarkers that are routinely available in all patients (age, hormone levels) or are affordable (SST2 and CAM5.2 IHC). It can improve medical management of acromegaly by helping make rational therapy choices, reducing acromegaly morbidity and mortality, the therapeutic burden on patient's quality of life, and health services costs."



BY DEREK BAGLEY Senior Editor



Artificial intelligence (AI), more specifically machine learning (ML), is a useful tool to study the impact of different biomarkers on the therapeutic response simultaneously and to design accurate prediction models.





This integrated analysis comprises one of the largest controlled study populations reported to date in people living with thyroid eye disease, which allowed us to evaluate a variety of patient subgroups, including those whose symptoms were considered more severe.

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New Integrated Data Show Promise for Novel Thyroid Eye Disease Drug

Phase 3 clinical trials further reinforce that teprotumumab-trbw significantly improves proptosis and diplopia for thyroid eye disease (TED) in patients in different subgroups, with most maintaining a long-term response. The results were published recently in *The Lancet Diabetes & Endocrinology*. Teprotumumab-trbw is a fully human monoclonal antibody (mAb) and a targeted inhibitor of the insulin-like growth factor-1 receptor (IGF-1R). Horizon Therapeutics plc is marketing the drug as TEPEZZA^{*}.

"This integrated analysis comprises one of the largest controlled study populations reported to date in people living with thyroid eye disease, which allowed us to evaluate a variety of patient subgroups, including those whose symptoms were considered more severe," says Endocrine Society member George Kahaly, MD, PhD, professor of medicine and endocrinology and metabolism, Johannes Gutenberg University Medical Center, and primary author of the paper. "Of most importance, the data clearly show that TEPEZZA mitigates varying levels of disease severity, including proptosis and diplopia, which are the most progressive and difficult findings to treat, and that improvements continue for the long term."

In this report, treatment study outcomes and follow-up off-treatment data were integrated from two 24-week multicenter, double-masked, placebo-controlled clinical trials where patients were randomized to receive TEPEZZA (n=84) or placebo (n=87) once every three weeks for a total of eight infusions. The final treatment study visit was at week 24, which was three weeks after the final infusion. Responses were also evaluated at seven weeks and 51 weeks after the final dose of TEPEZZA. Responses were analyzed for proptosis

and diplopia, as well as a post-hoc analysis of a combined outcome measure: the "ophthalmic composite outcome." The composite outcome is calculated as the percentage of patients with clinical improvement in one eye in at least two of the following: 1) proptosis, 2) diplopia, 3) eyelid swelling, 4) lid aperture, 5) globe motility, and 6) Clinical Activity Score (CAS), without deterioration of at least two of these outcomes in either eye.

New Study Findings

- There was no evidence for acute disease rebound (increase in percentage of patients no longer meeting proptosis, diplopia, or ophthalmic composite outcome) seven weeks after the last dose of TEPEZZA.
- Proptosis (87%; 62/71), diplopia (66%; 38/58), and ophthalmic composite outcome (92%; 66/72) responses were observed seven weeks after the last dose of TEPEZZA.
- A post-hoc analysis of the composite ophthalmic outcome indicated that 81% (68/84) of TEPEZZA patients versus 44% (38/87) of placebo patients were responders at week 24.
- Proptosis (67%; 38/57), diplopia (69%; 33/48), and composite outcome response (83%; 48/58) were observed 51 weeks after the last dose of TEPEZZA for those who had long-term off-treatment data available.

Efficacy in Difficult-to-Treat Patients at Week 24

▶ In a post-hoc analysis, TEPEZZA-treated patients with more severe disease (those

with $\geq 3 \text{ mm}$ of proptosis and/or inconstant or constant diplopia) and those with less severe disease at baseline both experienced significant improvements in proptosis and diplopia.

- ▶ In patients with more severe disease, those treated with TEPEZZA had a proptosis response of 79% (50/63) compared to 17% (11/65) of those who received placebo (P<0.0001), and a diplopia response of 68% (38/56) compared to 31% of those who received placebo (15/49) (P<0.0001).
- ▶ In patients with less severe disease, those treated with TEPEZZA had a proptosis response of 71% (15/21) compared to 9% in those who received placebo (2/22) (P<0.0001), and a diplopia response of 80% (8/10) compared to 30% in placebo (3/10) (P=0.015).
- In post-hoc analyses, patients who received TEPEZZA in both the lower baseline CAS subgroup (4 or 5) and the higher CAS subgroup (6 or 7) demonstrated statistically significant improvements compared with placebo in proptosis and diplopia. Overall response and CAS of 0 or 1 response also improved.
- Post-hoc analysis from the Phase 3 study demonstrates that in patients treated with teprotumumab, those with higher ($\geq 10 \text{ IU/L}$) or lower (<10 IU/L) serum thyrotropinbinding inhibitory immunoglobulin (TBII) baseline levels both had a proptosis response (mean reduction of -3.65 mm and -3.01 mm, respectively) with no treatment difference between the two groups (P=0.43). In patients with higher baseline TBII, 71% (10/14) of

patients who received TEPEZZA experienced an improvement in diplopia compared to 23 percent (3/13) of patients who received placebo (P=0.0046).

Adherence and Safety

- Nearly 91% of patients in the TEPEZZA treatment group (76/84) and the placebo treatment group (79/87) completed the randomized, double-masked treatment period.
- There were no new safety concerns identified in the follow-up period or as part of the pooled analysis that had not been identified in the 24-week treatment period. Of those patients who experienced adverse events, most were mild to moderate (grade 1 or 2) in intensity during the follow-up period. There were no serious adverse events related to TEPEZZA treatment during the follow-up period, as assessed by trial investigators.
- No anti-drug antibodies were reported that impacted safety or efficacy.
- ▶ Of the most commonly reported adverse events with TEPEZZA, muscle spasm (18%, 95% CI 7.3 28.7), hearing loss (10%), and hyperglycemia (8%, 95 percent CI 1.7 15.0) had the greatest risk difference from placebo. Hearing impairment events were all classified as nonserious, and all patients continued in the study without event worsening or discontinuing treatment.



There were no new safety concerns identified in the follow-up period or as part of the pooled analysis that had not been identified in the 24-week treatment period.

ENDOCRINE ITINERARY

ASMBS 2021 Virtual Annual Meeting June 10 – 12, 2021

The American Society for Metabolic and Bariatric Surgery's 2021 Annual Meeting is the largest gathering of surgeons and integrated health professionals practicing in the field of metabolic and bariatric surgery. Attendees can look forward to learning about the latest advances in the surgical treatment for obesity, networking with world-class faculty and industry experts, and much more. The future looks bright for the ASMBS Annual Meeting and for increasing the number of patients who could benefit from this life-saving and transformational surgery. https://asmbs.org/professional-

education/annualmeeting

22nd Annual Harvard Nutrition Obesity Symposium: Global Food Systems and Sustainable Nutrition in the 21st Century

Tuesday, June 15, 2021 8:00 a.m. – 5:30 p.m. (EST) The Nutrition and Obesity Research Center at Harvard will focus its 2021 virtual symposium on Global Food Systems and Sustainable Nutrition in the 21st Century that will feature an outstanding lineup of speakers who are experts in the fields of public health, global food systems, nutritional inequities, and sustainable nutrition. Registration is free of charge, but space is limited. Join thought leaders in the field for this signature event. www.norch.org

American Diabetes Association's 81st Scientific Sessions

Virtual Event June 25 – 29, 2021

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 more than 2,800 original research presentations, take part in provocative and engaging exchanges with diabetes experts, and expand professional networks with over 12,000 attendees from around the world.

https://professional.diabetes.org/ scientific-sessions



Virtual 2021 Clinical EndocrinologyUpdate/Endocrine Board ReviewCEU 2021EBR 2021Sept. 10 – 12, 2021Sept. 22 – 24, 2021

Every year, the Endocrine Society holds Clinical Endocrinology Update (CEU), which brings together hundreds of endocrine clinicians for a unique learning experience.

This year, due to concerns regarding the safety of both attendees and faculty stemming from the COVID-19 outbreak, the Endocrine Society is conducting these sessions in a virtual learning environment.

CEU 2021 offers an opportunity to stay up to date on the newest breakthroughs in clinical endocrinology. Expert faculty deliver a comprehensive three-day program covering a range of clinical practice areas using interactive, case-based learning.

Endocrine Board Review (EBR) is an essential course for endocrinologists preparing to take the boards or practicing physicians seeking an intensive knowledge assessment. The virtual program is designed as a mock exam, with rapid-fire case-based questions emulating the format and subject matter of the ABIM's Endocrinology, Diabetes, and Metabolism Certification Examination. Attendees will have early access to topical on-demand presentations with detailed answer rationale (available in late August).

www.endocrine.org/ceu2021 • www.endocrine.org/ebr2021

ENDOCRINE ITINERARY

ADCES Annual Conference

August 12 - 15, 2021

Association of Diabetes Care & Education Specialists Annual Conference (virtual): All sessions will be recorded and available to access on-demand through Monday, November 8, 2021. We will miss seeing our fellow diabetes care and education specialists, friends, and partners together in Phoenix, but we believe this decision is in the best interest of our collective communities. Over 5,000 people joined us virtually for ADCES20, so we are keeping what worked and improving on the challenges we experienced. The result will be a best-in-class virtual experience for all attendees focused on learning, collaborating, and networking. www.diabeteseducator.org/annual-meeting/ adces21

Heart in Diabetes New York, N.Y. September 10 – 12, 2021

This CME conference brings clinical leaders in diabetes and cardiovascular disease and practicing clinicians together to improve the care of patients at a high risk of cardiovascular, metabolic, and kidney diseases. This program is designed to evaluate the clinical science aspects of diabetes, obesity, and cardiovascular disease, focusing on the heart and kidney in diabetes. The goal is to develop appropriate, comprehensive clinical management plans aligning endocrinologists, cardiologists, nephrologists, and all other interested clinicians in their understandings of the impact of diabetes and CVD outcome trials on the clinical management of these very high-risk patients. www.heartindiabetes.com

90th Annual Meeting of the American **Thyroid Association**[®]

September 29 – October 3, 2021 Scottsdale, Ariz.

This meeting is designed for the community of endocrinologists, basic scientists, internists, surgeons, nuclear medicine scientists, pathologists, trainees, nurses, physician assistants, advanced practice providers, and other health care professionals who wish to broaden and update their knowledge of the thyroid gland and its disorders.

www.thyroid.org

INTERNATIONAL ITINERARY

SLENDO 2021

August 5 – 7, 2021

The annual congress of the Sri Lanka College of Endocrinologists has continued to progress as the best academic event in Sri Lanka. The goal of SLENDO 2021 is to update and enhance endocrine knowledge among endocrinologists, physicians, trainees, and primary care doctors, both locally and internationally. SLENDO 2021, will feature the participation of more than 50 eminent speakers from Europe, U.S., Canada, Australia, and New Zealand along with outstanding regional endocrinologists from South Asia. https://slendo.lk/

WCO-IOF-ESCEO London 2021 August 26 - 19, 2021

London. England

The 2021 Word Congress on Osteoporosis, Osteoarthritis, and Musculoskeletal Diseases will take place in London August 2021 with a very exciting scientific program that will bring together the world's best in the field of musculoskeletal health and disease. The International Osteoporosis Foundation (IOF) and the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO) are thrilled to welcome you in London and hope that this Congress will move the field one step forward on all fronts; from new understanding of bone metabolism and pathology, to new strategies and options in prevention, diagnosis and treatment. https://www.wco-iof-esceo.org/

EndoBridge 2021

Antalya, Turkey

October 21 - 24, 2021

EndoBridge® is a unique initiative with the vision of bridging the world of endocrinology. EndoBridge® is co-hosted by the Endocrine Society and the European Society of Endocrinology in collaboration with the Society of Endocrinology and Metabolism of Turkey. The meetings are held in English with simultaneous translation into Russian, Arabic, and Turkish. Accredited by the European Accreditation Council for Continuing Medical Education (EACCME), this three-day scientific program includes state-of-the-art lectures delivered by world-renowned faculty and interactive sessions covering all aspects of endocrinology. EndoBridge® provides a great opportunity for physicians and scientists from around the world to interact with each other, share their experience and perspectives, and participate in discussions with global leaders of endocrinology. www.endobridge.org

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2021 ENDOCRINE CASE MANAGEMENT: MEET THE PROFESSOR CME: 30.0



ENDOCRINE BOARD REVIEW 12TH EDITION (2020) CME: 21.0

ABIM MOC: 21.0



CEU 2020 SESSION RECORDINGS

CME: 28.75 ABIM MOC: 28.75 AANP: 27.95 (including 15.35 hours of pharmacology)

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DASHBOARD

Nothing has returned to normal yet. I find it challenging to focus on research while managing the clinical work overload due to unattended non-COVID-19 patients during the hardest times of the pandemic. In my country, research resources are very limited, and I am afraid that due to the COVID-19 crisis and after the pandemic, research will be impacted, and funding opportunities will fall dramatically. Fortunately, it seems that the COVID-19 numbers are calming down, and hopefully we can resume research and clinical work soon. Personally, I cannot wait to meet my colleagues and friends again at the national and international scientific meetings."

Endocrine Society 2021 Early Investigator Award winner, Ana Aulinas, MD, PhD, of the Hospital de Sant Pau in Barcelona, Spain,
 discussing the impact of COVID-19 on her research in "Researchers Roundtable" on page 26.



Adults who ate their first meal before 8:30 a.m. each day had lower insulin resistance compared with those who started eating after 8:30 a.m., independent of eating interval duration.

- SOURCE: MARRIAM ALI, MD, FROM THE SESSION, "PERFECT TIMING: ASSOCIATIONS BETWEEN DIETARY TIMING, EATING INTERVALS AND METABOLIC HEALTH" PRESENTED AT ENDO 2021.

MEMBER SPOTLIGHT

Ahmad Al Maradni, MD



Ten years ago, Ahmad Al Maradni boarded a one-way flight from Syria to the U.S. "I had come to the realization that leaving home was a sacrifice I would need to make in order to grow into the type of physician I desired to be," he says. "I have chosen endocrinology

because it offers the opportunity to be an excellent researcher, clinician, and educator simultaneously. To me, there is no other area of medicine that combines these three skills in such a perfect way. I have deep curiosity about the immunology, pathophysiology, and preventive approaches for type 1 and 2 diabetes."

Maradni's research at Joslin Diabetes Center in Boston, Mass., focused mainly on medical therapies for type 2 diabetes and several interventional investigations of nutritional and medical weight-loss approaches. He is now pursuing his dream as a first-year fellow at University of Arizona in Phoenix on the way to becoming an adult endocrinologist.

Learn more about your fellow Endocrine Society's members at: www.endocrine.org/memberspotlight.

Reproductive Life Span Increasing in U.S. Women



3.5 years

The mean age at menopause has increased by 1.5 years, from 48.4 to 49.9.

J.8 years

The mean age at menarche declined by 0.8 years, from 13.5 to 12.7.

2.1 years

The mean reproductive life span of women increased by 2.1 years, from 35.0 to 37.1 years.

- SOURCE: JAMA



Some adult children of women who received the drug hydroxyprogesterone caproate (OHPC) used to prevent miscarriage, during pregnancy in the 1950s and 1960s, are now experiencing more than twice the odds of cancer.

65%



5x

4X

OHPC-exposed offspring had a nearly five times higher rate of colon and rectal cancers compared with nonexposed offspring.

OHPC-exposed offspring had almost four times the rate of prostate cancer compared with nonexposed offspring.

 SOURCE: CAITLIN MURPHY, PHD, MPH, ASSISTANT PROFESSOR, UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER IN DALLAS, TEXAS, FROM HER SESSION, "IN UTERO EXPOSURE TO 17 HYDROXYPROGESTERONE CAPROATE MAY CONTRIBUTE TO INCREASING INCIDENCE RATES OF EARLY-ONSET CANCER," WHICH WAS PART OF THE "ENVIRONMENTAL ENDOCRINE DISRUPTION IN DEVELOPMENT AND DISEASE" PRESENTATION AT EMDO 2021.



"Now I am going to ask you again: where are the three beans that this lab spent 5 years and six billion dollars to develop?"



The percentage of hospitalized COVID-19 patients newly diagnosed with diabetes – SOURCE: AMERICAN DIABETES ASSOCIATION



BY JONATHAN Q. PURNELL, MD, **OREGON HEALTH & SCIENCE UNIVERSITY, PORTLAND, OREGON**

By joining with the American Academy of Family Physicians, the American Association of Nurse Practitioners, and the American Academy of Physician Assistants, the Endocrine Society has created an educational coalition to address the challenges of treating patients with both type 2 diabetes and cardiovascular disease.

ogether with the American Academy of Family Physicians (AAFP), the American Association of Nurse Practitioners (AANP), and the American Academy of Physician Assistants (AAPA), the Endocrine Society was honored to participate in the interprofessional education program, "Current and Future State of Cardiovascular Disease and Type 2 Diabetes."

The program envisioned bringing voices together from different clinician trainings and backgrounds to discuss the intimate connections between cardiovascular disease and type 2 diabetes. Surveys have shown that professional societies are the most trusted sources of information for members, who prefer to learn from their peers on how to best apply the

PEEReview. Review. The Lin A New Partnership Examines the Links Between Cardiovascular Disease and Diabetes



science to their specific clinical practice. To enhance learning, the curriculum included multiple interactive case studies developed with the primary care provided treating patients with diabetes in mind.

This educational effort focused on cardiovascular disease (CVD) as the leading cause of death and a major cause of morbidity and mortality for people living with type 2 diabetes. A survey by the American Heart Association and the American Diabetes Association showed that only half of people ages 45 years and older with type 2 diabetes recognize their increased CVD risk or have discussed their risk with a healthcare provider.

Primary care providers, who manage most patients with diabetes, are treating a growing number of patients with established cardiovascular disease. Recent cardiovascular outcomes trials (CVOTs) have demonstrated the cardioprotective effects of new antidiabetic therapies, which create the need for clinicians to consider cardiovascular outcomes data, in addition to achieving glycemic targets, when choosing therapies.

The intersection between these two complicated diseases and their complementary treatment goals makes coordination of care to reduce cardiovascular risk even more important. This complexity also supports the importance of a team-based approach, including all healthcare professionals, to manage the elevated CVD risk in this patient population. Bringing this four-pronged team together, we utilized a variety of training scenarios to review available management approaches to treat patients with diabetes, including stage-specific recommendations for lifestyle, medications, and weight loss surgery.

Three open-access, free educational programs were created to follow the progression of cardiovascular disease from early/prediabetes to advancing/progressive disease to late stage/managing advanced complications. All three cases can be found at the Resource Center, which includes links to accredited programs for endocrinologists, family physicians, nurse practitioners, and physician assistants, with individually provided links from each association for more education.

The case-based scenarios are outlined below with learning objectives discussed throughout. Faculty will walk through the cases with interactive panels throughout for a robust discussion.

Case 1: Prediabetes and Cardiovascular Risks: A Primary Call to Action

Meet Lisa, a 31-year-old Hispanic female presenting for her annual exam. She was diagnosed with gestational diabetes seven years ago and both parents have obesity and type 2 diabetes. She had a 12-pound weight gain over the past year and is currently not on any medications. Lisa's A1C is 6.0% with elevated triglycerides and HDL-C at 234 mg/dL and 31 mg/dL, respectively. She works the overnight shift as a deputy sheriff with excessive soda and takeout consumption but little time for exercise with her two young children.

Join the faculty as they address their collaborative treatment recommendations and lifestyle modifications through the learning objectives below:

- Discuss the epidemiology of prediabetes and diabetes.
- Review risk factors, screening tools, and diagnostic criteria for prediabetes and diabetes.
- Describe the pathophysiology and complications of prediabetes.
- Analyze the relationship between prediabetes and cardiovascular disease.
- Develop and implement screening strategies for a patient presenting with prediabetes.
- Formulate an evidence-based treatment plan for patients with prediabetes including lifestyle and pharmacologic interventions.

Case 2: Patient-Centered Management of Diabetes and Prevention of Cardiovascular Disease

Meet Les, a 67-year-old Black male with type 2 diabetes for 12 years in addition to hyperlipidemia, hypertension, and earlystage chronic kidney disease (CKD). He does not always refill his five medications on time and has a high deductible. He frequently dines out and exercise includes golf games where he usually consumes five to six beers.

Join the faculty as they discuss cardiovascular outcome trials (CVOTs) and a team approach to strengthening diabetes selfmanagement through the learning objective below:

Discuss prevalence and associations of diabetes, cardiovascular disorders (CVD), and diabetic kidney disease (DKD). Surveys have shown that professional societies are the most trusted sources of information for members, who prefer to learn from their peers on how to best apply the science to their specific clinical practice. To enhance learning, the curriculum included multiple interactive case studies developed with the primary care provided treating patients with diabetes in mind."

- Recognize diabetes as a CVD equivalent and accelerator.
- Review behavioral interventions for mitigating CVD and DKD risk in type 2 diabetes.
- Distinguish major drug classes and outcomes from cardiovascular outcome trials (CVOTs) related to impacts on glycemic control, CVD, and DKD risk reduction in type 2 diabetes.
- Develop clinical strategies using CVOT drug classes to optimize glycemic goals and reduce CVD and DKD risk for patients with type 2 diabetes.
- Implement a team approach to diabetes care encouraging patient-centered diabetes self-management skills, education, and support (DSMES).

Case 3: Managing Macrovascular Complications in Patients with Diabetes

Meet Tony, a 62-year-old white male with diabetes, multivessel coronary artery disease (CAD), DKD with an eGFR of 38 mL/min/1.73m2, and Charcot Arthropathy. His A1C is 9.1% with fluctuating pre-prandial blood glucose, LDL is 104 mg/dL, and albumin creatinine ratio (ARC) is 447 mg/gram. Tony has a fair diet and no history of smoking or excessive drinking. However, he has poor medication adherence.

Join the faulty as they discuss macrovascular complications, hypoglycemic prevention and treatment, and increase adherence along with cultural competencies through the learning objectives below:

- Review major risk factors for coronary artery disease, diabetic kidney disease, and heart failure in patients with type 2 diabetes.
- Summarize the associations of type 2 diabetes, CVD and DKD, and implications to the progression of cardiorenal syndrome (CRS) and CV mortality.

- Apply CVOT results to provide guidance on appropriate pharmacologic interventions for patients with advanced diabetes-related complications.
- Analyze the impact of hypoglycemia in patients with advanced coronary artery disease and discuss techniques for mitigating risk of hypoglycemia.
- Employ tools and techniques to improve adherence and long-term chronic disease outcomes.

We thank the primary care and specialty organizations for their participation in content development, which enabled us to create clinically relevant content for our target audiences, resulting in better cardiovascular risk management for patients with diabetes.

All content can be found on the collaborative Resource Center at: https://www.endocrine.org/education-and-training/ cardiovascular-disease-and-type-2-diabetes.

Purnell, professor of medicine at Oregon Health & Science University in Portland, served as chair of the "Current and Future State of Cardiovascular Disease and Type 2 Diabetes" program. Joining him were Angela Thompson, DNP, FNP-C, BC-ADM, CDE, FAANP, Hendricks Endocrinology and Diabetes Youth Foundation of Indiana; Jeffery Unger, MD, FAAFP, FACE, of Unger Primary Care Concierge Medical Group and Catalina Research Institute; and Jonathan Weber, MA, PA-C, FAAPA, of the Yale School of Medicine Physician Associate Program.

The Resource Center and the educational programming was made possible by a grant from Boehringer Ingelheim Pharmaceuticals, Inc., Lilly USA, LLC, and Novo Nordisk. We are grateful for their support of this important clinical resource.



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CLINICAL ENDOCRINOLOGY UPDATE (CEU) 2021 SEPTEMBER 10-12 ENDOCRINE.ORG/CEU2021

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Each year the Endocrine Society recognizes endocrinologists who are in the early stages of their research careers by giving out the Early Investigator Awards. Endocrine News spoke to the five researchers from around the world to find out more about their award-winning research, the award's potential impact, as well as how the COVID-19 pandemic has impacted their research and their lives.

Researchers RUUIDIABLE TALKING TO THE 2021 EARLY INVESTIGATOR AWARD WINNERS

where the boost of the second science of the second science over the past year. There are, however, many stories of progress and breakthroughs in research that highlight the perseverance of scientists who soldiered on during 2020 to continue to impact the health and lives of global citizens. Five such endocrine researchers in the blossoming stages of their careers have been recognized with the Endocrine Society's 2021 Early Investigator Award.

The winners are: Himanshu Arora, PhD, of the University of Miami in Coral Gables, Fla.; Ana Aulinas, MD, PhD, of the Hospital de Sant Pau in Barcelona, Spain; Athansisos Bikas, MD, PhD, of Brigham and Women's Hospital in Boston, Mass.; Juan Brito, MD, of the Mayo Clinic in Rochester, Minn.; and Manuel D. Gahete, PhD, of the University of Córdoba in Audalusia, Spain.

Endocrine News spoke with them to learn more about their research, how COVID-19 impacted their labs, and what the award means for their work.

BY GLENDA FAUNTLEROY SHAW

Endocrine News: To get an idea of who comprises our "early investigators," can you share at what stage you are in your fellowship or year as faculty?

Himanshu Arora: I am in the second year as faculty in the Department of Urology, Sylvester Cancer Center, University of Miami.

Ana Aulinas: I am a postdoc research fellow investigating hypothalamic and pituitary diseases in the Pituitary Diseases Unit led by Professor Susan Webb, while working as a clinical endocrinologist at Hospital de Sant Pau in Barcelona, Spain. Also, I was appointed as assistant professor at the University of Vic-Central University of Catalonia in 2020.

Athansisos Bikas: I am currently a clinical and research fellow in endocrinology at the Brigham and Women's Hospital/Harvard Medical School in Boston. I am completing my first year of fellowship.

Juan Brito: I finished my endocrine fellowship in 2014 and my thyroid cancer fellowship in 2016, after that I joined the Division of Endocrinology at the Mayo Clinic.

Manuel D. Gahete: I obtained my PhD 10 years ago, and after a three-year postdoctoral training at the University of Illinois at Chicago, I then returned to Spain to start an independent career as a principal investigator (PI). In 2019, I obtained



Himanshu Arora, PhD, University of Miami, Coral Gables, Fla.

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[The Early Investigator Award] will definitely help me a lot in getting recognized in the field. connect with research groups at a national as well as international level. establish collaborations in the field, and share our work with a broader audience. I strongly believe that these are some of the very important requirements for developing myself as an endocrine scientist.



Ana Aulinas, MD, PhD, Hospital de Sant Pau, Barcelona, Spain

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From one day to the next, I had to stop doing my job as a clinical endocrinologist and researcher to be on the front line of the pandemic to attend COVID-19 patients and selfisolated myself from my family for several months. However. I felt the enormous responsibility of helping my colleagues at the front line.

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Athansisos Bikas, MD, PhD, Brigham and Women's Hospital, Boston, Mass.



After the first wave of the pandemic, we were seeing patients that were sicker from their underlying diseases because they did not (or could not) come to the doctor. Research-wise, our translational work was affected as we could not go to the lab. Hopefully, we will not have to deal with another pandemic for the next 100 years!

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Nothing has returned to normal yet. I find it challenging to focus on research while managing the clinical work overload due to unattended non-COVID-19 patients during the hardest times of the pandemic. In my country, research resources are very limited, and I am afraid that due to the COVID-19 crisis and after the pandemic, research will be impacted, and funding opportunities will fall dramatically. - ANA AULINAS, MD, PHD

a tenure-track position, and recently I have been appointed associate professor at the University of Cordoba.

EN: What inspired you to apply for the award?

Arora: Endocrine Society is one of the oldest, largest, and most prestigious societies. Getting recognition from this society is a strong reflection on the direction of our research. While applying for this award, I wanted to know if I am on the right track or not. And now I have the answer thanks to the Society.

Aulinas: I was very fortunate to have the opportunity to do a postdoc fellowship for two years in the Neuroendocrine Unit at the Massachusetts General Hospital in Boston. I was also very lucky to have an incredible mentor, Dr. Elizabeth Lawson, who encouraged me to apply for this award.

Bikas: The Early Investigators Award is very prestigious. A lot of amazing researchers who I look up to have been awardees in the past, so I thought I should give it a try!

Brito: Endocrine research has been highly focused on understanding the pathophysiology of hormones. My interest has been more focused on the impact of endocrine conditions in patients' lives and how endocrine care is delivered. My nomination was an opportunity to recognize the importance of patient-centered healthcare delivery research in endocrinology.

Gahete: I have been closely connected with the activities of the Endocrine Society from the beginning of my research career. Indeed, I received a "Summer Research Fellowship" at the very beginning of my scientific training, and I have been an affiliated member of the Society for many years. This active participation



in different initiatives inspired me to apply for the award with the support of the institutions wherein I have developed my research activity.

EN: Please explain your research in a few sentences.

Arora: Our research mainly focuses on prostate cancer research, which involves but not limited to: 1) understanding the mechanisms behind androgen regulation, exploring the molecular checkpoints that are critical for resistance development during different stages of cancer progression; 2) exploring nitric oxide as a immunotherapy and evaluating its efficacy as a monotherapy or in combination with various preclinical as well as FDA-approved drugs against prostate cancer; and 3) developing the machine learning tools to study the progression of prostate cancer using digital pathologies from cancer patients.

Aulinas: I am conducting innovative multidisciplinary clinical research focused on two main lines of investigation. One line is aimed at expanding our understanding of pathophysiology and outcomes of patients with pituitary/adrenal diseases and tumors, despite being endocrinologically "cured," in particular, acromegaly and Cushing's syndrome. The other line of research is intended to define oxytocin secretory characteristics to identify and clinically characterize oxytocin deficiency in patients with hypopituitarism.

Bikas: My research has mainly focused on thyroid cancer. With the guidance of my amazing mentors, I have conducted both clinical and translational studies. Our translational studies have focused on exploration of alternative agents (i.e., Metformin,



Juan Brito, MD, Mayo Clinic, Rochester, Minn.

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Endocrine research has been highly focused on understanding the pathophysiology of hormones. My interest has been more focused on the impact of endocrine conditions in patients' lives and how endocrine care is delivered. My nomination was an opportunity to recognize the importance of patientcentered healthcare delivery research in endocrinology.

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Manuel D. Gahete, PhD, University of Córdoba, Andalusia, Spain

This award boosts my enthusiasm and dedication to continue with the research in the endocrinology field. From a broader point of view, it will contribute to visualize the support and recognition of one of the most relevant Societies in the field to the research work I have developed during the earliest stages of my career, which will help to consolidate my emerging position within the endocrine field.

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Nelfinavir, Mitotane) for the treatment of thyroid cancer. An exciting component of our work has been targeting the thyroid cancer cell metabolism. From the clinical standpoint, we have done several studies on radioactive iodine and a clinical trial of a tyrosine kinase inhibitor in advanced thyroid cancer. I would like to take this opportunity to thank my mentors for everything: Drs. Kenneth Burman, Leonard Wartofsky, Vasyl Vasko, Kirk Jensen, Douglas Van Nostrand (and also a wonderful team of people I have worked with over the years) in Washington, D.C., as well as my new research team in Boston, Drs. Erik Alexander, Inigo Landa, and Anand Vaidya, among others.



Brito: Thyroid cancer incidence has increased in the U.S. and worldwide, mostly due to the diagnosis of small and indolent thyroid cancer. This overdiagnosis of thyroid cancer has led to the overtreatment of patients. My research has explored the magnitude of thyroid cancer overdiagnosis, its main drivers (i.e., inappropriate use of thyroid ultrasound and thyroid nodule biopsy), how overdiagnosis changes based on country and geography, and different interventions to overcome thyroid cancer overtreatment (role of active surveillance, shared decision making, relabeling cancer).

Gahete: My research activity has been focused in understanding the crosstalk between pivotal neuroendocrine players like somatostatin, ghrelin, growth hormone or IGF-I, and, particularly, novel splicing variants thereof, and various human pathologies (mainly, endocrine-related cancers and metabolic diseases such as obesity and diabetes) to identify and characterize novel and relevant molecules that could be used as diagnostic, prognostic, and/or therapeutic markers for these diseases.

EN: What have been the biggest challenges of doing your work during the pandemic?

Arora: The things which I found most challenging was to interact with people (in person), meeting new people, developing new collaborations, and to be honest, it hasn't changed a lot until now. But other than that, thanks to the proactive and

enthusiastic people I am surrounded with, we tried our best to be functional, at least as much as we could, while being safe and socially distanced.

Aulinas: It has been and still is a hard time. The pandemic has had an impact on both clinical and research activities. From one day to the next, I had to stop doing my job as a clinical endocrinologist and researcher to be on the front line of the pandemic to attend COVID-19 patients and self-isolated myself from my family for several months. However, I felt the enormous responsibility of helping my colleagues at the front line. Nothing has returned to normal yet. I find it challenging to focus on research while managing the clinical work overload due to unattended non-COVID-19 patients during the hardest times of the pandemic. In my country, research resources are very limited, and I am afraid that due to the COVID-19 crisis and after the pandemic, research will be impacted, and funding opportunities will fall dramatically. Fortunately, it seems that the COVID-19 numbers are calming down, and hopefully, we can resume research and clinical work soon. Personally, I cannot wait to meet my colleagues and friends again at the national and international scientific meetings.

Bikas: This past year has been extremely difficult for everyone. However, I am grateful for having the opportunity to care for patients with COVID-19 (and other diseases) during this time. From the clinical standpoint, our everyday practice shifted and we had to focus more on treating COVID-19 patients. Also, after the first wave of the pandemic, we were seeing patients that were sicker from their underlying diseases because they did not (or could not) come to the doctor. Research-wise, our translational work was affected as we could not go to the lab. Hopefully, we will not have to deal with another pandemic for the next 100 years!

Brito: The biggest challenge was not being able to maintain the same level of interaction with our research team and finding the value and purpose of our research in the middle of a deadly pandemic.

Gahete: The pandemic has represented a substantial obstacle to advance both research activities and teaching duties. Here, in Spain, we have suffered a complete lockdown of all the non-

essential activities, which [resulted in virtual] research and teaching during many months. Maybe the adaptation of all the virtual activities has represented the biggest challenge during the pandemic.

EN: How do you hope winning the Early Investigator Award will help support your goals as an endocrine scientist?

Arora: It will definitely help me a lot in getting recognized in the field, connect with research groups at a national as well as international level, establish collaborations in the field, and share our work with a broader audience. I strongly believe that these are some of the very important requirements for developing myself as an endocrine scientist.

Aulinas: I hope winning this award will increase my networking and will favor the establishment of new collaborations. I am just really grateful.

Bikas: I hope that it will help with future scientific collaborations. Also, it is definitely going to be very helpful in the advancement of my career as a physician-scientist.

Brito: The award gives a platform to highlight the importance of healthcare delivery research in endocrinology, which in turn could help others to understand its value and improve funding. It could also have a positive impact on future career development opportunities.

Gahete: This award represents an important milestone in my scientific career in that it implies the recognition of the accomplishments gathered as an endocrine researcher. The repercussion of such a well-renowned international award will undoubtedly help support my scientific activity. From the personal perspective, this award boosts my enthusiasm and dedication to continue with the research in the endocrinology field. From a broader point of view, it will contribute to visualize the support and recognition of one of the most relevant Societies in the field to the research work I have developed during the earliest stages of my career, which will help to consolidate my emerging position within the endocrine field.

EARLY INVESTIGATOR AWARD

All of the recipients received a monetary award, one-year complimentary Endocrine Society membership, one-year complimentary access to the Society's online journals, and public recognition of their research accomplishments in various Society platforms.

> Additional information on this award and the recipients is located on the Society's website at: www.endocrine.org/awards/earlyinvestigators-awards.

The new application cycle opens in September 2021.



6 The award gives a platform to highlight the importance of healthcare delivery research in endocrinology, which in turn could help others to understand its value and improve funding. It could also have a positive impact on future career development opportunities. – JUAN BRITO, MD

- FAUNTLEROY SHAW IS A FREELANCE WRITER BASED IN CARMEL, IND. SHE WRITES THE MONTHLY LABORATORY NOTES FOR *ENDOCRINE NEWS*.



Since the first, all-virtual **ENDO 2021** stemmed from the lingering effects of the COVID-19 pandemic, *Endocrine News* presents an overview of the research that specifically addressed how the virus affects patients with common comorbidities. These studies looked at COVID-19's effects on patients with obesity, hyperglycemia, adrenal insufficiency, and a lack of vitamin D, and provide a better understanding of this new and often devastating phenomenon.

BY KELLY HORVATH Olision INSES ENDO 2021 SESSIONS EXAMINED COMORBIDIT AFFECTED COVID-19 PATIENT OUTCOMES

fter the successes of the all-new ENDO Online 2020 and virtual versions of the Endocrine Society's Clinical Endocrinology Update and Endocrine Board Review programs last year, even more records were broken in March with the first-ever all virtual ENDO 2021.

This virtual meeting of the minds saw more than 7,000 attendees from around the world, with the brunt attending from within the U.S. (4,157), but there were quite a number of people tuning in from Canada (27), Mexico (152), Brazil (37), the United Kingdom (22), Australia (168), and 137 tuned in from Thailand! And while the majority of attendees were clinical practitioners (3,000+), there were

almost 900 clinical researchers and almost 500 basic scientists tuning in, with clinical fellows in training (672), graduate students (238), residents (346), educators (200+), and others all checking out this one-of-a-kind content.

One of the reasons for this "highlights" article is that there was no way you could catch every single session that was offered; there were 219 live and on-demand sessions, 46 live and on-demand Meet the Professor sessions, 24 oral abstract sessions, 10 ancillary symposia, six live plenary sessions, and 1,976 posters! There were also 17 different product theaters that had an average of over 400 attendees each with more than 50 exhibitors receiving an average of 161 visitors for each booth!



Suffice to say, in those four days from March 20 to 23, there was a lot to take in, and chief among the benefits of **ENDO 2021** being all virtual was that everything was literally right at your fingertips. Attendees saw for themselves that endocrine science was once again at the forefront of creating a better understanding of COVID-19; myriad groups of scientists presented their topical research on the biggest endocrine challenges related to the pandemic.

Researchers examined the implications of COVID-19 infection for individuals with certain comorbidities, including obesity, hyperglycemia, adrenal insufficiency, and vitamin D deficiency. The studies highlighted here include:

- "Obesity Is Associated with Intensive Care Use and Duration of ICU Stay but Not Mortality Among 3,246 Patients Hospitalized with COVID-19"
- "Sugar is Not Always Sweet: Exploring the Relationship Between Hyperglycemia and COVID-19 in a Predominantly African American Population"
- "Risk of Complications in Children with Adrenal Insufficiency and COVID-19"
- "Pre-admission Vitamin D Supplementation in Patients with Low 25[OH]D May Improve COVID-19 Outcomes"

In each of these areas, their research represents cuttingedge science, given that the pandemic is still a relatively new occurrence, and they have not had the time or opportunity to conduct long-term studies. What little is known about how COVID-19 affects or is affected by concomitant disease is thanks to resourcefulness and enterprise.

Obesity and COVID-19

Yu Mi Kang, MD, PhD, of Yale New Haven Health in New Haven, Conn., presented her team's study on COVID-19 and obesity. With obesity being so widespread, and preliminary studies suggesting that it increases vulnerability to SARS-CoV-2 infection, Kang and team set out to elucidate the mechanisms by which obesity increases this susceptibility to infection or predisposes to worse COVID-19 outcomes. Given the currency of the COVID-19 pandemic, early studies on the subject were, by necessity, on the small side with short-term follow-up periods, among other design weaknesses that led to questions about the accuracy of results, particularly in terms of the relationship between body mass index (BMI), COVID-19 infection, and associated mortality. This team wanted to set the record straight.

"We aimed to determine the association of obesity with outcomes among patients hospitalized for COVID-19 using a large cohort with calculated BMI," Kang says. The Yale Department of Medicine COVID Explorer (DOM-CovX) database contains clinical information across five hospitals in the Yale health system across Connecticut and Rhode Island. Using DOM-CovX, the team included 3,246 patients ages 18 years and older, who were hospitalized between March and September 2020 and had positive polymerase chain reaction (PCR) tests confirmed between 14 days prior to admission until the date of discharge.

"The primary endpoints were in hospital death or transition to hospice care, ICU admission, and the length of ICU stay," Kang says. "We used the first weight on admission or the most recent weight within 90 days of admission, followed by manual chart review." They used the World Health Organization (WHO) classifications of obesity: Grade 1 overweight = BMI of 25–29.9 kg/m, Grade 2 overweight = BMI of 30–39.9 kg/m, and Grade 3 overweight = BMI \geq 40 kg/m.

Of the proportion of people hospitalized with COVID-19, less than 25% had normal weight, whereas 43% fell into the obesity category. The median age of all hospitalized patients with COVID-19 was 65; for those underweight, it was 78.5; for those with normal weight it was 75; for those overweight, it was 65; and for those with obesity, it was 59. Those with obesity were more likely to be female and more likely to have diabetes at baseline.

"A total of 16.7% of our hospitalized COVID-19 patients died or transitioned to hospice care compared to the normal-weight group," Kang says. In unadjusted analysis, the underweight group showed the highest crude mortality rates, and mortality across obesity class did not go up. Other findings included that about 25% of hospitalized patients were admitted to the ICU, and the obesity group showed a significantly higher crude ICU admission rate compared with the normal weight group. They also looked at ICU admission rate by obesity grade and found, not surprisingly, that Grade 3 obesity conferred the highest risk.

When they adjusted each analysis for age, gender, race, ethnicity, diabetes, chronic kidney disease, cardiovascular disease, neurological disease, liver disease, hypertension, immunosuppressive therapy, and respiratory disease, overall obesity as well as Grades 2 and 3, again, not surprisingly, were associated with increased ICU admission compared to normal-weight individuals. Individuals with obesity also had a longer duration of ICU stay by almost 3.0 days compared with normal-weight individuals, who stayed an average of 6.6 days. Breaking the obesity group down by grade showed the expected incremental trend with individuals with Grade 3 obesity staying in the ICU 10.2 days on average.

LOG ON FOR More Endo 2021 Highlights

ENDO 2021 was jam packed so you might have missed out on a few things. Be sure to check out the highlights online where you can see:

ENDO Faculty Interviews
 Expert Overviews
 Virtual Presentations
 Oral Session Summaries
 Poster Podcasts
 ENDO Leadership Interviews

And be sure to tune into the interview with Endocrine Society president Carol Wysham, MD, who talks about her objectives for the next year as well as her personal highlights from **ENDO 2021**.

https://endohighlights2021.com



Since ENDO 2021 was the first all-virtual annual conference, there was a significant increase in attendees from around the world. Many of these international attendees might not have otherwise attended had ENDO 2021 taken place in San Diego, Calif., as planned.



Empowered at ENDO 2021

In my position as a chief scribe at Stanford, and prior medical scribe in endocrinology, I attended **ENDO 2021** to supplement my clinical experiences with additional educational sessions. **ENDO 2021** is the first international conference I have attended and the first research conference I was accepted to as first author on a presentation (with mentorship and guidance by Dr. Marina Basina). It was great interacting with health professionals on the conference session forums, Twitter, and through my virtual presentation booth.

I learned so much from many of the "bench to bedside" and Meet the Professor talks, and appreciated that the virtual format allowed me to re-watch interesting sessions. As a prehealth student, soon to be applying to medical school, it was inspiring to see the high-level discussions that take place at research conferences, as well as the collaborative sharing of knowledge. I'd like to also thank Dr. Deborah Sellmeyer for her many teachings in the clinic on metabolic bone disease, and the Stanford Medical Scribe Fellowship (COMET) for providing me a strong clinical foundation and sponsoring my registration to attend this conference. **ENDO 2021** was an empowering conference! I look forward to attending **ENDO 2022** and hope that it can be in person.

- JACOB LESS, CHIEF SCRIBE OF SPECIALTY CLINICS; RESEARCH ASSISTANT, DIVISION OF PRIMARY CARE AND POPULATION HEALTH; DIVISION OF ENDOCRINOLOGY, GERONTOLOGY, AND METABOLISM STANFORD UNIVERSITY SCHOOL OF MEDICINE, STANFORD, CALIF. The surprise came when their adjusted results showed no significant association of obesity with in-hospital death or transition to hospice care, despite the higher likelihood of ICU admission and longer stays. Although the team has not definitively uncovered where this possible protective effect might come from, Kang posited that COVID-19-targeted therapies like dexamethasone and remdesivir use had become the protocol in patients with obesity, and this might have mitigated some of the effects attributable to obesity. Whether such an influence exists will of course require additional investigation.

Concluded Kang: "[Our study] underscores the vulnerability of individuals with obesity during the current pandemic and emphasizes the need to ensure that obesity is given appropriate consideration in COVID-19 prevention and management." She furthermore suggests that having a reliable risk-stratification method that could be further applied to vaccination guidelines and COVID-19 management protocols is one way to achieve that important clinical goal.

Hyperglycemia and COVID-19

The relationship between hyperglycemia and COVID-19-positive in a predominantly African American population was discussed by Samara Skwiersky, MD, MPH, a second-year internal medicine resident physician at the State University of New York (SUNY) Downstate Medical Center in Brooklyn, N.Y.

At the time of her presentation, the pandemic was responsible for over 28 million cases of COVID-19 in the U.S. and more than 500,000 deaths. In New York City (as elsewhere), the more than 700,000 cases disproportionately affected African Americans, who are two to three times more likely than White American to die from COVID-19 infection. In New York City, Blacks have 300 deaths per 100,000 compared to 178 deaths per 100,000 in non-Hispanic Whites. The concomitant high prevalence of diabetes among Blacks got Skwiersky and team wondering how a prior diagnosis of diabetes could affect outcomes in patients with COVID-19. Although a few studies conducted during the pandemic have identified both diabetes and hyperglycemia independently as risk factors for worse clinical outcomes with COVID-19, no studies had focused on this relationship in African Americans. Swiersky and team filled that gap with their retrospective cohort study of all COVID-19 patients admitted to SUNY Downstate Medical Center, designated as a COVID-19-only center by New York Governor Andrew Cuomo, between March 1 and May 15, 2020. They collected patient demographics, clinical characteristics, and outcomes from the hospital's electronic medical records system and

used multivariate logistic regression analysis to calculate adjusted odds ratios for outcomes of mortality, intubation, ICU admission, and acute kidney injury (AKI) based on prior diagnosis of diabetes and admission blood glucose levels. They also performed a multiple linear regression analysis for the continuous outcome of length of stay.

Of the 982 patients hospitalized during the study time period, the 708 patients who tested positive for COVID-19 were at least age 18 years and had sufficient data available for analysis were included in the final study cohort. This cohort was divided into subjects with and without diabetes and then again by admission blood glucose >140 or <140 and >180 or <180 mg/dL, based on the current American Diabetes Association guidelines recommending a target glucose of 140 – 180 for most patients during hospitalization. Of the cohort, 89% were Black, the mean age was 68 years, and 54% (383 patients) had a known history of diabetes.

Overall clinical outcomes included a sobering 40% crude mortality rate. When odds ratios were adjusted for age; sex; BMI; white blood cell count; creatinine; and history of hypertension, cardiovascular disease, and chronic kidney disease, overall, hyperglycemia on admission resulted in worse clinical outcomes in patients hospitalized with COVID-19 with and without diabetes. "Patients with diabetes who had an admission glucose >140 compared to those with glucose <140 had a significantly increased risk of intubation and ICU admission, whereas those with an admission glucose >180 had increased risk of mortality alone," Swiersky says. In comparison, patients without diabetes with an admission glucose >140 had increased risk of mortality, ICU admission, intubation, and AKI, whereas those with glucose >180 had increased risk of mortality, ICU admission, and intubation. The relationship between admission glucose of 140 - 180 and mortality in patients with and without diabetes was not statistically significant.

Thus, admission glucose levels outside of recommended levels is associated with inpatient mortality in patients with COVID-19 infection. "Specifically, we found that patients without diabetes presenting with glucose >180 had fourfold increased odds of death, whereas those with a history of diabetes and glucose >180 had only 1.8 increased odds of death," Swiersky says. "These findings are consistent with other studies published prior to the pandemic, which found a greater association between hyperglycemia and mortality in patients hospitalized without a prior diagnosis of diabetes."

Two big questions remain. One is whether hyperglycemia is the result of or a cause of more severe COVID-19 illness. Could



Engaging and Exhilarating

The virtual format of **ENDO 2021** was well organized and easy to navigate. The clinical sessions were very lively, which helped me get more engaged in a way not possible before in a conventional meeting. I enjoyed Master Clinician session, "Thyroid Nodule: Whack It, Zap It, or Leave it Alone," where experts from endocrinology, endocrine surgery, and radiology discussed approaches to thyroid nodules from their perspectives. The lively discussion was very engaging, and the fact that we can type in questions in real time was exhilarating.

What I enjoyed the most was "Lipid Management in Patients with Endocrine Disorders: An Endocrine Society Clinical Practice Guideline." It was helpful to learn directly from the guideline authors the evidence and thinking processes behind the guideline. You can pose your questions in real time, and the moderator was excellent in picking pertinent questions. We do not always have the ultimate answers in medicine, but seeing a consensus achieved through rational discussions real time almost makes you feel like you're participating in the process.

Product theaters were highly informative. For basic research, the wonderful thing about **ENDO** is that you will be exposed to wide array of research disciplines, from big data to GPCR, nuclear receptors, and adipose tissue biology.

For me, **ENDO 2021** was an immense success, and I hope that it will continue as a hybrid session of on site and remote. On site is needed, especially for international attendees as the time difference will be a burden in attending remote sessions. Nonetheless, I'd love to have the luxury of attending **ENDO** from the kitchen counter in coming years.

— TAE-HWA CHUN, MD, PHD, ASSOCIATE PROFESSOR OF INTERNAL MEDICINE, MEND, MEDICAL SCHOOL, BIOINTERFACES INSTITUTE, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.



A Child-Friendly ENDO

I have been attending the Endocrine Society Annual Meetings since I was a pediatric endocrinology fellow. It is truly amazing to have the opportunity to listen to the most updated scientific knowledge in endocrinology in only four days. This year was the first time I attended the **ENDO** virtually. Even though I miss seeing my pediatric endocrine buddies from all over the nation in person, the virtual platform allowed me to be with my children while attending my favorite lectures and research symposiums.

My favorite sessions were "Addressing the impact of structural racism on Endocrinology and Health Care" in which my FLARE mentor, Dr. Joshua Joseph, was one of the speakers. This was such an important session, especially in the current times when awareness of the racial disparities in the U.S. is more important than ever. My second favorite session was about my current research area, "The Value of Early T1D Diagnosis and Beta-cell Preservation" presented by Dr. Henry Rodriguez. **ENDO 2021** was an outstanding event this year!

--- LINA HUERTA-SAENZ, MD, FAAP, ASSISTANT PROFESSOR OF PEDIATRICS, DIVISION OF PEDIATRIC ENDOCRINOLOGY AND DIABETES, DEPARTMENT OF PEDIATRICS, PENN STATE HEALTH CHILDREN'S HOSPITAL, PENN STATE COLLEGE OF MEDICINE, HERSHEY, PA. intensive glucose control with more frequent monitoring and treatment with insulin to a target glucose of <140 improve outcomes in patients hospitalized with COVID-19? Current Endocrine Society guidelines recommend that all patients hospitalized with blood glucose >140 be monitored and treated with appropriate therapies, so it seems reasonable that patients with COVID-19 who present with hyperglycemia would require this much and more.

The second question is why patients without a history of diabetes fared worse than patients with diabetes despite similar blood glucose levels. Metformin taken by many patients with diabetes could be exerting a protective effect, but this hypothesis has not been studied. Swiersky also points out that a limitation of her team's study is that hemoglobin A1c was not measured on admission, so distinguishing patients with undiagnosed diabetes from those with stress hyperglycemia caused by illness was not done.

Adrenal Insufficiency and COVID-19

Manish Raisingani, MD, of the University of Arkansas for Medical Sciences and Arkansas Children's Hospital in Little Rock, Ark., presented research about the risk of complications in children with adrenal insufficiency and COVID-19, an area with scant existing data. Because of their lack of cortisol, children with adrenal insufficiency are unable to mount a normal stress response to infections, which can put them at a higher risk of complications from infections and means they are often given stress-dose steroids during infection.

Using the TriNet X database that collects information from healthcare organizations in 31 different countries, Raisingani and team compared children ages 0 to 18 years diagnosed with COVID-19 with and without adrenal insufficiency for complications including mortality, sepsis, and intubation. Among more than 600,000 children without adrenal insufficiency diagnosed with COVID-19 infection, 215 died, representing a relatively low risk of mortality of 0.03%. "The kids who had the diagnosis of adrenal insufficiency at least a month prior to the COVID-19 infection had a much higher risk of mortality," Raisingani says. "Their relative risk was almost 23 times higher."

Knowing that children with adrenal insufficiency also tend to have respiratory illnesses, lupus, or secondary adrenal insufficiency from long-term steroid use, the team adjusted their findings, which brought the relative risk down to about fourfold higher. "So adrenal insufficiency can independently be associated with higher risk of mortality independent of other medical issues," Raisingani says. With likelihood of sepsis and intubation, the adjusted risk was also higher in children with adrenal insufficiency compared to those without.

For basic research, the wonderful thing about **ENDO** is that you will be exposed to wide array of research disciplines, **from big data to GPCR**, **nuclear receptors**, **and adipose tissue biology**."

- AAE-HWA CHUN, MD, PHD, ASSOCIATE PROFESSOR OF INTERNAL MEDICINE, MEND, MEDICAL SCHOOL, BIOINTERFACES INSTITUTE, UNIVERSITY OF MICHIGAN, ANN ARBOR, MICH.

"It is very important for children with adrenal insufficiency to take precautions during these times — to take their medications properly as well as take their stress doses properly," concludes Raisingani. Especially with schools having begun to reopen, stress dosing as soon as a child gets sick to prevent significant complications due to COVID-19 or any other infections is critical. "Parents should also be reeducated about using the emergency injection of hydrocortisone as needed at home."

He also mentioned that distinguishing between primary and secondary adrenal insufficiency might change the data.

Vitamin D Deficiency and COVID-19

Sweta Chekuri, MD, and Sarah Baron, MD, MS, of Montefiore Health System and Albert Einstein College of Medicine in the Bronx, N.Y., presented research on how preadmission vitamin D supplementation in patients with low 25-hydroxy-vitamin D may improve COVID-19 outcomes. This team, knowing that vitamin D supplementation has demonstrated efficacy in respiratory illnesses like the flu and respiratory syncytial virus, wanted to know if repurposing this inexpensive treatment for COVID-19 infection might improve outcomes.

Their study population was all 124 adults with COVID-19 admitted to Montefiore Medical Center between March 11 and June 2, 2020, with a preadmission 25-hydroxy-vitamin D <30. They defined severe COVID-19 disease as mechanical ventilation or death, insufficient vitamin D level as 20 – 30, and vitamin D deficiency as <20. Of the predominantly female and predominantly Hispanic cohort, the median age was 64 years, and the median BMI was 29.1; 64 were not supplemented with vitamin D, and 60 were supplemented with \geq 1000 units of cholecalciferol or ergocalciferol weekly.

"In our primary outcome, we noted vitamin D supplementation with ≥1000 units weekly had no significant effect on severe COVID-19 in the unadjusted or adjusted model," Chekuri says. "But in subgroup analysis, we noted lower odds of severe COVID-19 outcomes in the unadjusted model for those patients deficient with 25-hydroxy-vitamin D, which also held true when supplementation was \geq 5000 units weekly." These findings, however, were not statistically significant.

In patients in the vitamin D-deficient group, 39.1% of those not supplemented had severe COVID-19 outcomes, but only 25% of those supplemented with \geq 1000 units weekly had severe COVID-19 outcomes, and only 21.7% of those supplemented with \geq 5000 units weekly (again, not statistically significant).

"Though it was not significant, our data demonstrated a difference in severe COVID-19 outcomes based on vitamin D supplementation," Chekuri says. "This effect was more pronounced in patients with preadmission 25-hydroxy-vitamin D <20." As only half of the patients in their study with a level that low were supplemented, Chekuri, Baron, and team suggest that providers should proactively prescribe vitamin D supplementation to any patient at risk for COVID-19 with deficient vitamin D levels to offer protection against worse outcomes. This begs the question, should everyone go have their levels checked? Probably not everyone, explains Baron, but if you are symptomatic, or you are at risk for COVID-19, see your provider and get it checked. "If it's low, supplement."

As more and more people get vaccinated each day, hopes are high that **ENDO 2022** will see throngs of endocrinologists from around the world converge in Atlanta, Ga., next June. For those who can't make the trip, no doubt there will be a virtual option available. However, whether in person or via an electronic device, breakthroughs in endocrine science will continue to improve the health of millions around the world.

AWARDS AT

Recognition and Responsibility

Hydelene B. Dominguez, MD, the first winner of the Endocrine Society's
C. Wayne Bardin International Travel
Award, talks to *Endocrine News* about how her Filipino community inspired
her to pursue research on radioactive refractory thyroid cancer, as well as her excitement at the prospect of attending **ENDO 2022** in Atlanta.



BY GLENDA FAUNTLEROY SHAW

side from being the first completely virtual annual conference, ENDO 2021 also was the setting for the inaugural presentation of the Endocrine Society's C. Wayne Bardin International Travel Award, which was given to Hydelene B. Dominguez, MD, for her research on pheochromocytoma, a rare neuroendocrine tumor.

Armed with a mission to heal the Igorot people from her village in the mountains of northern Philippines, Dominguez has overcome the challenges of a rural, indigent birthplace to become the chief fellow of the Division of Endocrinology, Diabetes and Metabolism of UP-Philippine General Hospital.

The C. Wayne Bardin International Travel Award, an award that pays tribute to Bardin, who died in 2019, and recognizes his passion for nurturing young researchers by covering the costs to send a young, outstanding endocrinologist to **ENDO**. Candidates for the award are chosen based on the quality of their **ENDO** abstract and the overall quality of their science.

Endocrine News asked about her mission to improve the

endocrine health of people in her homeland and her **ENDO** travel plans.

Endocrine News: How did it feel learning you were the first winner of the Bardin award?

Dominguez: When I first learned that I had been selected as the recipient of such a prestigious award, I was astounded. Never in my wildest dreams did I imagine this would happen in my life. Because of my self-doubt and lack of confidence, I was initially reluctant to participate in the screening. But my mentor, Dr. Elizabeth Paz-Pacheco, never gave up on me and kept encouraging me until I turned in my paper. I will be eternally grateful to her. Furthermore, I am sincerely grateful and honored to have been chosen, and this is all because of the people who believed in me and helped me become who I am today, particularly my family, mentors, colleagues, co-authors, and patients. I am aware this award is both a recognition and a responsibility. Truly, I am more committed to persevere to become a better researcher and endocrinologist to heal more patients and uncover answers to many questions in our field.

EN: Your letter to the Endocrine Society describing your Igorot heritage and the medical care in your village is inspirational! When did your dream of being a doctor first begin and what or who was the biggest influence in helping you leave your wonderful village for a medical school far away?

Dominguez: Growing up, I witnessed the difficulty of community members who had to drive for hours to the city for medical consultations. I am also aware that other patients in remote parts of our community had to be transported by hammock because no roads were accessible for the ambulance or cars to travel. Traveling was daunting back then, and there were few public transit options. This reality inspired me to pursue a career as a doctor. Furthermore, I know that most Igorots would rather visit the local "mambunong" or native priest than be examined by medical doctors. Thus, I chose to be educated and trained in one of the country's well-known hospitals, despite the fact that it is far from my family and hometown, in order to establish my reputation and expertise in my field of specialization. Indeed, I am willing to make the sacrifice of being away from the people and the place I love for a few years to gain the information and skills I need to better serve my hometown.

EN: You won the Bardin award for your excellent ENDO 2021 research on pheochromocytoma. Can you briefly describe where you are with your work and what's next for you?

Dominguez: My appreciation for medical research has awakened my interest in conducting studies. Unfortunately, I come from a community where research is laid back. I had to work hard to learn how to do such, and I am very grateful to a lot of mentors who patiently coached me and instilled in me the values of research.

At present, I am working on research in thyroid and diabetes. Specifically, I am focusing on understanding the radioactive refractory thyroid cancer among Filipino patients because there is currently no data available for the Filipino community. In addition, I am working on knowing the effect of enhanced community quarantine among patients with diabetes to their overall health during this COVID-19 pandemic. I am hoping that the findings will help us, clinicians, better understand our patients and manage their health effectively. I plan to expand my research to bone health and adrenal disorders in the future. **HONORING A LEGACY**



C. Wayne Bardin, MD,

was strongly committed to serving the Endocrine Society and for many years contributed his efforts with a high level of enthusiasm. Highlighted leadership roles include: director of the Clinical Endocrinology Update Course for many years; membership on the Endocrine Society Council;

and president of the Endocrine Society (1993 – 94).

He passed away in New York City on October 10, 2019, at the age of 85. During his scientific career, he contributed enormously to women's reproductive health by developing novel and effective contraceptive methods particularly applicable for use in underdeveloped countries. His key attributes included a passion to help provide reproductive services and training in countries with emerging economies as well as mentoring numerous trainees.

The award's new application cycle will open in October 2022. To be considered for the award, applicants must be an endocrine fellow currently in training or a junior faculty member for less than five years and submit an abstract to **ENDO 2022**.

More information on the award and application requirements can be found at: **www.endocrine.org/bardinaward**. Contact: **awards@endocrine.org** with any questions.

To contribute to this award, donate to the "In Memory of C. Wayne Bardin Fund" at: **www.endocrine.org/donation**.

EN: We're all hoping travel and conferences will be back to normal soon! Are you looking forward to ENDO 2022?

Dominguez: Certainly! I will be waiting for the day I can travel for **ENDO 2022**. It is a once-in-a-lifetime opportunity for a simple Igorota who has big dreams! It will be an honor to represent my country, especially my tribe, in an international meeting of the Endocrine Society. Further, I am excited to meet the people behind this prestigious award and to learn more about the life and works of Dr. C. Wayne Bardin.

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

OWARD COUNTY GENERAL HOSPITAL

PRACTICE RESOURCES

Andrew Demidowich, MD, (third from left) and members of the Inpatient Diabetes Management Service at Howard County General Hospital in Columbia, Md.

MANAGING DIABETES IN A COMMUNITY HOSPITAL SETTING

Two recent papers touted the benefits of having an endocrine hospitalist-led Inpatient **Diabetes Management Service** (IDMS) in a community hospital setting to reduce the rates of both hypoglycemia and hyperglycemia, length of stay, and even hospital costs. Endocrine News gets a firsthand look at a community hospital's use of an IDMS from both endocrinologists and a patient who experienced the service after a diabetes diagnosis.

In the fall of 2019, a patient presented to the emergency room at Suburban Hospital in Bethesda, Md., with blood sugar levels so high they were moments from slipping into a coma. The patient (who asked to remain anonymous) says they figured they could go home once their glucose was stabilized, but soon found themselves in the intensive care unit — a dizzying and disappointing series of events. The patient says that every time the hospital staff asked what they wanted for breakfast the next morning, it was yet another crushing blow.

The patient's endocrine physician during their stay was Mihail Zilbermint, MD, a clinical endocrinologist at Suburban, whom the patient refers to as "Dr. Z." The patient says the first morning they were in the ICU, Zilbermint came to their bedside at about 6:00 a.m. Still groggy and a bit disoriented, the patient knew they would have a hard time processing what Zilbermint had to say. "He started really talking to me about my diagnosis and treatment, and I said, 'Dr. Z. This is heavy stuff. Can you do me a favor? Can you come back? Can you let me wake up and come back in an hour?" the patient says. "And he did. He came back in an hour, we sat down, we had a talk, and he told me exactly who he was hooking me up with."

In the hospital setting, patients are already in tense, stressful situations and are usually sleep-deprived. A few minutes at patients' bedsides each morning is not enough to help them optimally manage a newly diagnosed disease like

BY DEREK BAGLEY

type 2 diabetes, especially once they are discharged. It would be like expecting someone to be fluent in a new language after a 30-minute lesson.

But just a couple years prior, Zilbermint and his team at Suburban, as well as Andrew Demidowich, MD, a chief clinical endocrinologist at Howard County General Hospital in Columbia, Md., and his team there launched hospitalwide initiatives to improve inpatient diabetes care and reduce rates of hyperglycemia and hypoglycemia. Glucose-targeting initiatives had been implemented at academic institutions in the past, but this was the first time something like that had been tried in a community hospital setting.

Improved Outcomes and Bottom Lines

Two papers appeared recently in the Journal of Diabetes Science and Technology, each with Zilbermint and Demidowich as coauthors. One paper detailed how the implementation of an Inpatient Diabetes Management Service (IDMS) was able to tackle hyperglycemia, and the other described multimodal strategies to reduce hypoglycemia in the community hospital setting (at Howard County General and Suburban, respectively - both part of the Johns Hopkins Health System). "[The IDMS] model of care has been shown to reduce rates of hyper- and hypoglycemia, hospital length of stay (LOS), and associated hospital costs," the authors write, "However, few studies to

66 Nobody wants to be sick. Nobody wants to have uncontrolled diabetes. It's just that they've lost hope. And offering them hope again is amazing. That is just one of the best feelings in the world to see patients regain excitement and hope over their challenging disease."

> - ANDREW DEMIDOWICH, MD, CLINICAL ENDOCRINOLOGIST, HOWARD COUNTY GENERAL HOSPITAL, COLUMBIA, MD.

date have evaluated the implementation of a dedicated IDMS in a community hospital setting."

Community hospitals make up about 85% of the hospitals in the U.S., and they account for almost 95% of all hospital admissions. Meanwhile, the authors point out that cost of



MD, (right) confers with Precious Ohagwu, PharmD, pharmacy resident (left) and Lee Ann Alexander, RPh, BCGP, a **Glucose Steering** Committee member, to discuss patient care as part of the **Inpatient Diabetes** Management Service at Suburban Hospital in Bethesda. Md.



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diabetes is currently accounting for almost \$250 billion — one in four healthcare dollars spent in the U.S. "It is estimated that hypoglycemia may add 31% to the overall cost for an inpatient stay, with the average cost of \$4,312 per admission. As a result, maintaining glycemic control in inpatient settings has received amplified consideration over the past few decades," they write.

Both papers conclude that implementation of IDMS significantly reduced rates of hyperglycemia and hypoglycemia, a boon not just for the patients and their clinical care teams, but possibly for the hospital system's bottom line.

For Demidowich, this team approach works for the dayto-day management of a particular patient, but it can also be used to address systemic problems in the hospital itself. By implementing an IDMS and creating a hospital Glucose Steering Committee, which meets monthly, "You get experts from all areas of the hospital looking at the problem together, which is nice because everyone can give their input in real time. Rarely anymore do we say, 'Well, I don't know the answer," Demidowich says. "You have somebody in the room who knows the answer, so you make progress much more rapidly." This teamwork has enabled an update to the hospital diabetic ketoacidosis (DKA) protocol, hypoglycemia policy, nursing education, and even the creation of a community diabetes support group.

From Inpatient to Outpatient

These specialized inpatient diabetes teams consist of endocrine hospitalists (endocrinologists), endocrine nurse practitioners, diabetes educators, registered dieticians, pharmacists, and so on. Aside from inpatient care, "the real important thing is getting [patients] home and keeping them home," Demidowich says. "And that involves other members of the team. So good coordination with case management, social workers, and the Population Health team is essential, to get patients resources that are available to them. It's important to set them up for success, both in the inpatient hospital setting, but also once they leave."

Patients and family members have also helped shape diabetes care in the community hospitals. Suburban Hospital is part of Hopkins' Patient Family Advisory Council, and the hospital has a lay person who has a daughter diagnosed with type 1 diabetes as part of the committee. "She's passionate about diabetes in general," Zilbermint says. "And she also played a core role in helping revise and establishing this new insulin hypoglycemia treatment protocol."

Both Zilbermint and Demidowich tell *Endocrine News* that patient education is incredibly important but, in practice, can be a "mixed bag." Again, these patients are sick and stressed (they're in the hospital, after all). They may have trouble accepting the diagnosis or changes to their lifestyles, or they may have very strong needle phobias. "Some patients just flat out say, 'I'm not doing insulin once I leave the hospital," Demidowich says. "And I say, 'You know what? While that's not ideal, it's okay. I'd rather we be honest with each other, and work together to come up with a treatment plan that is doable and works for you.' I'd rather send someone home on pills that they will actually take, rather than the perfect insulin regimen that they won't. Don't let perfection be the enemy of good."



Zilbermint says he has found success through collaborating with his patients but also helping them focus on one thing at a time — taking the time to listen to their biggest concerns (how to prevent hypoglycemia, for example) and staying on that topic. "The feedback from the patient is very positive," he says. "Some of the patients told me, 'Hey, nobody ever taught me how to prevent hypoglycemia."

"Nobody wants to be sick. Nobody wants to have uncontrolled diabetes," Demidowich says. "It's just that some patients have lost hope. And sometimes providing a little bit of education, reexamining their outpatient regimen, and discussing new treatment and testing options changes their entire outlook. Offering them hope again is amazing. That is just one of the best feelings in the world to see patients regain excitement, hope, and control over their challenging disease."

Changing Incrementally

But implementing initiatives like this at community hospitals nationwide won't happen overnight. Nothing but pre-fab furniture can be built in a day. A small rural community hospital may simply not have the resources for such an undertaking. But that does not mean there's nowhere to start.

Even large changes can be achieved incrementally. It may just involve starting with low-hanging fruit. "These are conversations to have with the hospital administration, to take a look at easy changes to improve care," Demidowich says. "It's very doable at any institution. You just have to start somewhere." Zilbermint confers with his fellow IDMS team members on the basics of how to guide patients who need help in using some of the various forms of diabetes technology.

> Hospital administrators may even perk up once they see the money that can be saved in the long run by implementing similar initiatives. Laying out hypoglycemia data may not garner much excitement from administrators, but telling them hypoglycemia is costing them \$100,000 a month will make those administrators snap to. Zilbermint explains: "If you come to the hospital administration and say we need an endocrinologist and they ask why, we can say that if you don't make these changes, you're going to lose \$100,000 per month. Then it's, 'Oh, okay, tell me more!"

Feeling Fortunate

Almost two years out from their hospitalization for high blood sugar and subsequent diagnosis of type 2 diabetes, Zilbermint's patient is doing very well. The patient says that within six months of discharge, they were off insulin and down to two metformin pills a day and weekly Trulicity. They credit not only the Suburban staff but also the outpatient endocrinologist Zilbermint referred them to, as well as their nutritionist for helping them lose 40 pounds (a nutritionist whom the patient says bakes delicious low-carb bread).

Also in the mix was a patient support and education group at Suburban called Thrive365, which holds monthly meetings on numerous topics, from diabetes and nutrition to brain and oral health.

The patient can't say enough good things about the nursing staff at the hospital, in the ICU, and in the intermediate care unit. "[The nurses] were so patient," the patient says. "Because you remember with this situation, they're not only taking care of you, but they're teaching you how to use stuff. I had to learn how to give myself the insulin, take my blood, all that kind of stuff. It was all very new to me and they wanted to make sure that when I left, I wasn't totally overwhelmed."

The patient was discharged on a Friday night, so Saturday morning was their first test at home. "Even though I knew what I was doing, it was overwhelming, but I learned very quickly how to deal with it," the patient says. "And I'm really thrilled that my case has taken the path that it has and that I don't have to deal with the insulin shots and that I can just take an oral medication and a Trulicity once a week. I feel fortunate."

- BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. HE WROTE THE APRIL ISSUE'S COVER STORY ABOUT THE JOURNEY OF NOBEL PRIZE WINNER ROBERT J. LEFKOWITZ, MD.

ADVOCACY



he Endocrine Society continues to lead advocacy efforts focused on lowering the cost of diabetes medication and has weighed in on recent congressional and administration activity regarding legislation and regulations aimed at lowering the price of prescription drugs.

In May, the House Energy & Commerce Health subcommittee conducted a hearing on legislation to lower the cost of prescription drugs. The Endocrine Society submitted a statement to the subcommittee calling on Congress to pass legislation to make prescription drugs more affordable. Our statement also highlighted the high price of insulin as an urgent issue that needs to be addressed. The hearing focused on H.R. 3, the Elijah E. Cummings Lower Drug Costs Now Act and other legislation to lower prescription drug prices. H.R. 3, which was recently re-introduced in the House of Representatives, is comprehensive legislation that aims to lower the cost of prescription drugs and protect patients' access to their medications. In April, the Society released a statement applauding the re-introduction of H.R. 3, which includes recommendations proposed in the Society's position statement on insulin access and affordability. Specifically, H.R. 3 would allow for the Secretary of Health and Human Services (HHS) to negotiate for better prescription drug prices and includes a provision to cap out-ofpocket costs on prescription drugs at \$2,000 per year for Medicare beneficiaries.

Endocrine Society Leads Efforts to Lower Cost of Prescription Drugs

The Endocrine Society met with the staff of Vice President Kamala Harris to learn more about the Biden administration's plans to address drug pricing and to offer the Society as a resource.

The Society also met with staff of Vice President Kamala Harris to learn more about the administration's plans to address drug pricing and offer the Society as a resource. Currently, the vice president is charged with working with senators to develop a



proposal that would get support in that chamber. As this issue of *Endocrine News* went to press, no clear plan had emerged. The administration is also exploring how it might lower drug costs through regulation and/or executive orders.

The Society will continue to advocate for lowering the cost of prescription drugs including insulin. We are planning to conduct a virtual Hill Day in July to advocate for lower prescription drug prices and other clinical issues.

Harris Photo: NumenaStudios/Shutterstock.com

As Congress Considers Funding Allocations for Next Year, Society Testifies About Priorities

Endocrine Society past-president E. Dale Abel, MD, PhD, testifies on May 19 for the Friends of the National Institute for Diabetes and Digestive and Kidney Diseases where he requested increased funding for both the NIDDK and the NIH.

The U.S. Constitution requires that Congress has "the power of the purse string" and must pass annual appropriations by October 1 of each year. Each year the House and Senate Appropriations Committees divide work into subcommittees with jurisdiction over certain federal programs. Of particular importance to the Endocrine Society are programs within the Subcommittee on Labor, Health and Human Services, Education and Related Agencies (LHHS) that funds the National Institutes of Health (NIH), Title X,

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With the COVID-19 pandemic illustrating the importance of funding public health programs, our requests included at least \$46.1 billion for the NIH, at least \$10 billion for the CDC, and at least \$737 million for Title X.

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and the Centers for Disease Control and Prevention (CDC). As in previous years, the Endocrine Society submitted written testimony to both subcommittees in support of federal funding for our priority programs. With the COVID-19 pandemic



illustrating the importance of funding public health programs, our requests included at least \$46.1 billion for the NIH, at least \$10 billion for the CDC, and at least \$737 million for Title X.

Our testimony provided further evidence in support for increased funding for these programs. We gave examples of recent cross-cutting advances in endocrine research as an example of the importance of providing a \$3.2 billion increase in the base appropriation for the NIH and the need to provide proportional increases across the various Institutes and Centers. To demonstrate the public health impact of the CDC, we highlighted how the National Diabetes Prevention Program addresses the increasing burden of prediabetes and type 2 diabetes in the U.S. We also emphasized the important role that Title X-funded health centers play in preventing unintended pregnancies, resulting in savings of \$7 billion to federal and state governments. We also called on Congress to provide emergency supplemental funding of \$10 billion for the NIH to enable new COVID-19-related research and support research recovery from the pandemic.

In addition to the Endocrine Society testimony, the House LHHS Subcommittee invited Endocrine Society past-president Dale Abel, MD, PhD, to provide testimony on behalf of the Friends of the National Institute for Diabetes and Digestive and Kidney Diseases (NIDDK) as a witness at the subcommittee's hearing on May 19. This was an extremely coveted spot to have "air time" with the subcommittee — only 25 public witnesses were selected. Abel's testimony amplified the same messages as the Endocrine Society about NIH funding but also added a request for the NIDDK to receive a proportional increase and provided research highlights including diabetes and other endocrine and metabolic diseases as well as digestive, liver, hematologic, and urologic examples across the NIDDK's research portfolio.

Following subcommittee hearings, attention will turn to the full appropriations committees of the House and Senate to pass individual appropriations bills or, more likely, a combined (omnibus) appropriations package to fund the federal government. The outlook for final passage is unclear and is likely to run up against the deadline of September 30, 2021. The Endocrine Society will continue to advocate for funding increases for its priorities.

Take Action

The Endocrine Society needs all U.S. members, particularly those funded by the NIH to join our advocacy efforts for us to truly have influence on federal funding decisions. Please join our online advocacy campaign (**www.endocrine.org/advocacy/takeaction**) to send an email to your representative and senators with our funding recommendations. In addition, be on the lookout for information this summer to join a virtual Hill Day/Rally for Medical Research on September 23, 2021, to meet with members of your congressional delegation to ensure that they finalize the appropriations process and support the Endocrine Society's public health priorities.

Society Participates in European Union Activity to Advise on Implementation of its Chemical Strategy

The Endocrine Society achieved a major victory in the new European Union (EU) Chemicals Strategy for Sustainability (CSS) by including several priority actions on endocrine-disrupting chemicals (EDCs) within the strategy. The CSS commits the EU toward a series of actions to better protect citizens and the environment and promote innovation in safe and sustainable chemicals. As attention turns to implementation of the strategy, we are continuing to engage with regulators and policy makers to ensure that regulatory changes are swift and effective.

In April, the European Commission selected the Society for one of 32 seats on a "high-level roundtable on the implementation of the Chemicals Strategy for Sustainability." The roundtable was established to advise the Commission on realizing the strategy's objectives through an ongoing dialogue, and our selection to participate in this important roundtable reflects our role as a trusted advisor to EU policy makers. On May 5, the Commission conducted the first meeting of the roundtable where Barbara Demeneix, PhD, chair of the Society's EDC Advisory Group, delivered remarks during the introductory session about the need to act quickly to minimize exposure to EDCs and protect human health. We also submitted a written statement outlining our priority objectives for the roundtable, including faster and more effective identification processes for EDCs, removal of identified EDCs from consumer products, and strengthening data requirements for EDCs through updated testing and screening methods.

In parallel to the discussions taking place at the roundtable, the Commission is also pursuing revisions to existing legislation to align regulations with the objectives of the CSS. On the same day as the roundtable meeting, the Commission published two "roadmaps" on the revision of the Regulation on Classification, Labeling, and Packaging (CLP), and on the revision of the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH). Guided by our EU EDC Task Force, the Society submitted public comments in response to the roadmaps where we supported the inclusion of a special hazard class for EDCs, argued for improved data requirements for hazard assessments of EDCs and mixture assessment factors, and called for extending the generic risk approach to EDCs.

The Society's engagement with EU policy makers reflects our members' important role in ensuring that chemical assessments are science-based and incorporate the latest knowledge about chemical interference with endocrine systems. We look forward to continuing the discussion with other members of the roundtable and helping the Commission achieve the ambitious goals described in the CSS.

TRANSGENDER HEALTH RESOURCES

Patients Have Questions. We Have Answers.

Hormone Health Network provides information and resources for pediatric endocrinology. Our goal is to help patients have informed discussions with their health care providers about pediatric endocrinology, and treatment. All our educational resources are based on the clinical and scientific expertise of the Endocrine Society.



POINT OF CARE TOOLS

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Which help to enhance patient understanding and increase confidence support their overall well-being.

Download Patient Guides

These evidence-based patient resources are a derivative of the Endocrine Society Clinical Practice Guideline used as point of care tools to support patient learning and comprehension.



Share Fact Sheets

We make understanding complex conditions endocrine related topics easy for patients.

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These visual tools offer a clear, accurate, concise way to increase patient understanding, involvement and promote informed conversations.

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



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