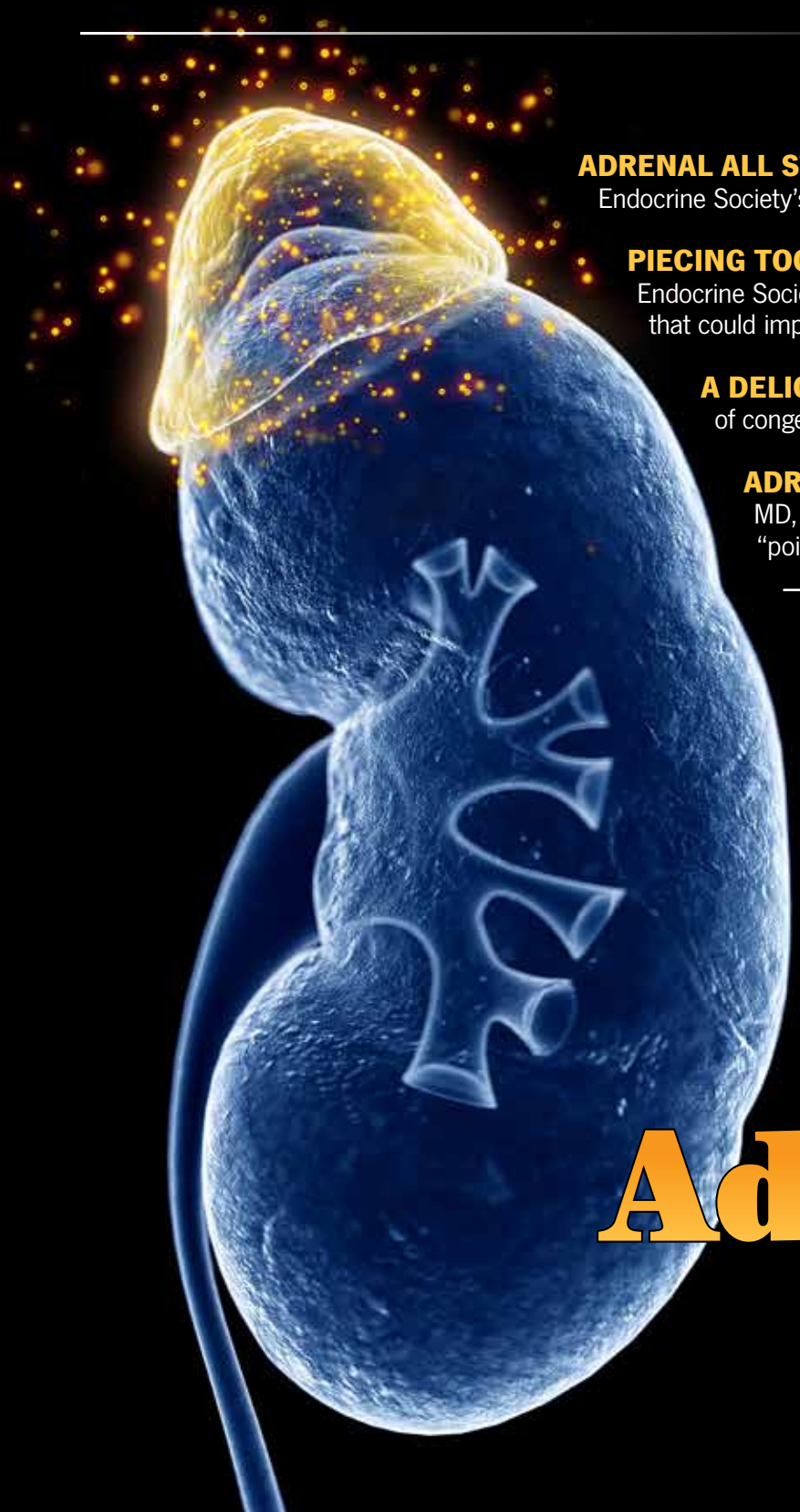
ENDO2026 CHICAGO, ILLINOIS, JUNE 13 – 16, 2026

APRIL 2026

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

# Endocrine news



**ADRENAL ALL STARS:** We catch up with some of the Endocrine Society's leaders in adrenal research and treatment.

**PIECING TOGETHER THE ADRENAL PUZZLE:** Endocrine Society journal studies shed light on recent research that could improve patient outcomes.

**A DELICATE BALANCE:** Navigating the complexities of congenital adrenal hyperplasia.

**ADRENAL INVESTIGATOR:** Kotaro Sasaki, MD, PhD, details how his laboratory's research is "poised to transform the field."

**For the first time in its history, *Endocrine News* devotes an entire issue to the adrenal gland, the latest research, future directions, and leaders in the field.**

# All About Adrenals

ENDOCRINE SOCIETY

*Hormone Science to Health*

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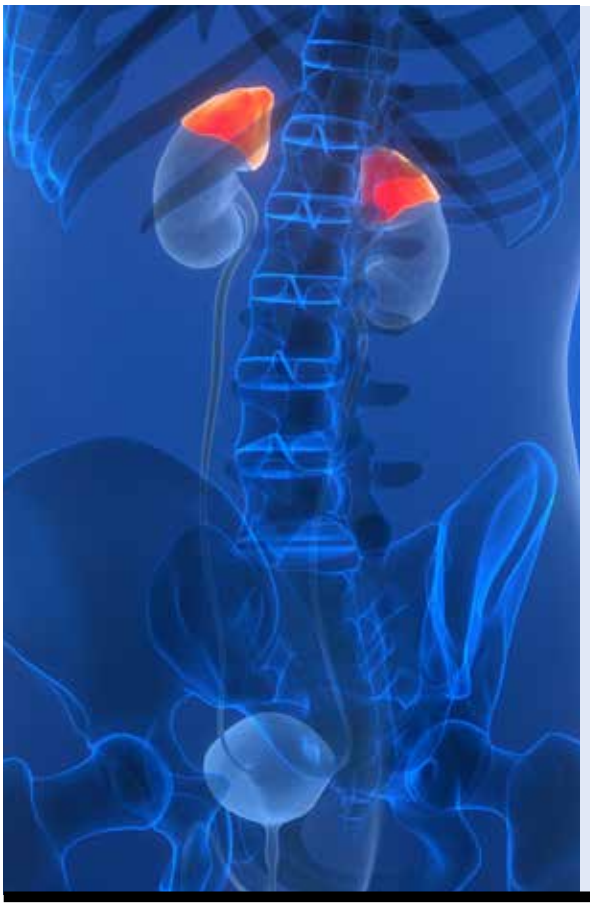



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ENDOCRINE SOCIETY
*Hormone Science to Health*



# Early-Career Members Grow Careers Through Our Professional Development Programs

Spring in the northern hemisphere is a time of exploration, growth, and transition. That's why I'm excited this month to highlight our Society programs that help rising clinicians and researchers explore, grow, and transition to careers in endocrinology.

One of our newer programs is the **Medical School Engagement Program (MSEP),** which in April will welcome 10 new member universities to join the 21 other institutions already taking part.

Since 2024, the MSEP has offered a pathway for the most talented medical students in the United States to explore the field of endocrinology and connect with some of our top leaders. The MSEP provides participating schools with curated resources and structured programming to highlight the vibrancy of our field.

By all indications, the program is achieving its aims. Participating schools averaged seven to 10 interest group sessions throughout the academic year, with an average of 20 – 25 students participating, based on data from our first year of programming.

We're delighted to recognize the dedication of these future clinicians … and, hopefully, endocrinologists. Forty-two MSEP students will travel to **ENDO 2026** in Chicago, Ill., in June to receive an Excellence in Endocrinology Award at our MSEP awards reception.

## Mentoring Programs

As an added benefit, MSEP medical students — as well as other students and residents — will have the opportunity to participate in **ENDO**'s Endocrine Mentor Day.

This popular daylong event connects mentees with accomplished endocrinologists who can answer questions and share their excitement for endocrinology. Together, they will attend sessions on the latest groundbreaking science as well as special interactive sessions.

Another mentoring program for early-career researchers is our **Grant Aims Accelerator Program**, which allows experienced mentors to review the mentees' specific aims draft (or international specific aims equivalent) for grant proposals.

> "As I look back on my long career, I'm always seeking ways to welcome more researchers and clinicians into the field that I love so much. The Society shares this passion. If you are starting out in your career, I encourage you to take advantage of these and other opportunities to maximize your success."

Offered exclusively to Society members, our mentors and mentees are matched by research interests. Pairs will meet informally at **ENDO 2026** to discuss how mentee's specific aims draft can be improved. Registration for the program ends Monday, May 4.

## Career and Leadership Training

The Society also offers programs for early-career researchers and clinicians to grow their professional lives.

**The Future Leaders Advancing Research in Endocrinology (FLARE)** program is designed for promising graduate students, postdoctoral fellows, clinical fellows, and junior faculty to learn how they can establish independent research careers.

We recently welcomed 25 FLARE participants into the 2026 class. These individuals, who hail from top universities across the United States, gathered at the Society's headquarters in Washington, D.C., March 26 – 28, for the in-person FLARE workshop.

The workshop focuses on the "business of research" and provides leadership training on challenges that early-career researchers often face. Participants heard sessions on the skills needed to market themselves for employment, as well as on transitioning into full-time research positions, and building long-term, successful careers.

FLARE offers benefits that extend well beyond the workshop. A vast FLARE network of alumni, faculty leaders, and peers are committed to supporting each other's growth.

Early-career clinicians also have a program designed to help them grow in their profession.

**The Excellence in Clinical Endocrinology Leadership (ExCEL)** program offers comprehensive leadership training and mentorship to early-career physicians in medicine and science.

As with FLARE, we recently welcomed 16 members into the 2026 ExCEL class, which is set to hold a two-day workshop, April 8 – 10, in Washington, D.C.

The ExCEL workshop offers practical leadership training on topics such as financial management, contract negotiation, and effective communication. Participants should walk away knowing how to navigate the transition into clinical practice and build the skills needed to grow as leaders in endocrinology.

ExCEL also has a vast mentoring network, from which participants can gain access to accomplished clinicians who provide career advice, feedback, and connections that continue long after the workshop ends.

## Training to Pass Board Exam

The Society takes seriously its mission to grow the profession, including by helping clinicians gain their credentials to become endocrinologists. Our long-running **Endocrinology Board Review (EBR)** program prepares physicians for success on the demanding American Board of Internal Medicine (ABIM) Endocrinology, Diabetes, and Metabolism certification exam.

EBR 2026 will offer online study sessions September 18 – 20, but the program is much more than that. Registration includes an interactive practice exam, a comprehensive board review book, in addition to the live study sessions with faculty who are experienced in preparing physicians for their certification.

Last but not least, I'm proud to highlight the expansion of our **ENDO 2026** travel grant program. The one-year initiative, announced in January, provides additional support for more early-career researchers to attend our annual meeting. The program provides:

- Increases to $1,500 per award recipient for Early Investigator Awards, Outstanding Abstract Awards, and Early-Career Forum; and
- Up to 200 additional grants of $1,500 per award recipient for the Outstanding Abstract Awards ($1,750 per award for international recipients).

We look forward to seeing these researchers at **ENDO 2026** in Chicago, Ill., along with our many other members.

As I look back on my long career, I'm always seeking ways to welcome more researchers and clinicians into the field that I love so much. The Society shares this passion. If you are starting out in your career, I encourage you to take advantage of these and other opportunities to maximize your success.

*Carol A. Lange, PhD*
*President, Endocrine Society*



# The First All Adrenal Issue

There's something fun about "firsts" with such a well-established publication such as *Endocrine News*. This month, I'm pleased to say, is another first: An issue devoted to the adrenal glands, those endocrine glands that "get our juices flowing" so to speak.

As it turns out, April is Adrenal Disease Awareness Month so we are highlighting some recent studies that are **"Piecing Together the Adrenal Puzzle."** On page 22, Kelly Horvath talks to the authors of some of these

> "As it turns out, April is Adrenal Disease Awareness Month so we are highlighting some recent studies."

studies about how their research can hopefully improve patient outcomes going forward. All of this research was published across the Endocrine Society journal collection, and they show how improved diagnostic accuracy, proper postoperative management, and a better understanding of rare adrenal pathologies can offer clinicians valuable tools when treating these patients.

On page 30, Senior Editor Derek Bagley has rounded up some of the Endocrine Society's **"Adrenal All Stars"** for a roundtable discussion where these leaders in adrenal endocrinology discuss everything from the latest developments in treatment and research, the gaps to some developments, as well as how research informs the treatment and vice versa. According to William Rainey, PhD, the Jerome W. Conn Professor of Medicine in the Departments of Molecular & Integrative Physiology and Internal Medicine at the University of Michigan, Ann Arbor, the Endocrine Society and its adrenal experts should continue to call out the social media-driven headlines that adrenal excess or deficiency is extremely common and that non-tested supplements should be used as a non-prescription therapy for non-existent adrenal diseases. "I

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realize this is not easy and some would say correcting these misconceptions actually provides them with a new audience," he says, "but these non-scientific ideas are starting to have audiences at high levels within the public and governmental domain."

Former *Endocrine News* associate editor and current writer of our monthly Trends and Insights column, Jackie Oberst, deals with the complexities of congenital adrenal hyperplasia (CAH) in **"A Delicate Balance"** on page 16. While it's well known that constant vigilance is a much-needed asset for both the patient and the clinicians when treating people with CAH, early screening, diligent monitoring, and a comprehensive holistic approach can be vital to ensure that complications are kept at bay while the patient maintains the highest quality of life possible.

And on page 40, Glenda Fauntleroy Shaw talks to award-winning **"Adrenal Investigator"** Kotaro Sasaki, MD, PhD, about his unique research that centers around building a human adrenal gland from stem cells, why all endocrine researchers should attend **ENDO** every year, and even touches on the often-challenging aspects of scientific publishing. His lab began its current work about five years ago when there were few, if any "high-quality studies showing how to generate the adrenal gland in a dish from stem cells in a robust physiologically meaningful way," he says. "Our approach has been to first understand how nature builds the adrenal gland during development, and then carefully recapitulate that process in a dish, step by step, using stem cells."

Let me know what you thought of *Endocrine News*' first adrenal issue and if you have any thoughts about future issue ideas, don't hesitate to speak up and let us know. As always, you can always reach me at: **mnewman@endocrine.org**.

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


# How XLH Impacts Skeletal Maturation and Predicted Height

New clinical research has identified a significant delay in skeletal maturation among children with X-linked hypophosphatemia (XLH), with male patients experiencing notably more pronounced delays than females. The study, published in the *Journal of the Endocrine Society*, highlights a significant gap between chronological age and bone age (BA). These findings provide clinicians with more precise benchmarks for predicting adult height and managing the complex growth trajectories of pediatric XLH cases.

At its core, XLH is a rare genetic disorder typically driven by mutations in the PHEX gene located on the X chromosome. This genetic anomaly leads to an overproduction of fibroblast growth factor 23 (FGF23), a hormone that regulates blood phosphate levels. Elevated FGF23 inhibits the kidneys' ability to reabsorb phosphate into the bloodstream and simultaneously reduces the production of active vitamin D.

The resulting "phosphate wasting" creates a state of chronic hypophosphatemia, which starves developing bone of mineral. Thus, children with XLH often develop rickets and osteomalacia, characterized by impaired mineralization of the growth plate.

BA is a primary metric used by pediatric endocrinologists to assess a child's growth potential. It is determined by comparing X-rays of a patient's hand and wrist against standardized atlases of skeletal development. Understanding the precise nature of maturation delays is essential for determining the optimal window for growth-promoting therapies and for setting realistic expectations for final adult height.

The retrospective and longitudinal assessment of 56 children revealed significant differences in how the disease affects the sexes. Researchers found that male patients exhibited an average BA delay of 1.2 years, while females showed a more modest average delay of 0.4 years. This disparity was even more striking when examining the frequency of severe delays: Approximately 58% of male participants were delayed by one to two years, compared to just 21% of females. Furthermore, a subset of patients in both sexes showed delays exceeding two full years, a factor that significantly complicates traditional growth monitoring and the timing of surgical or hormonal interventions.

Despite these significant lags in skeletal maturation, the research offers a silver lining: Standard height prediction models remain relatively reliable for this population. By utilizing both the Bayley-Pinneau and Tanner-Whitehouse methods, researchers determined that predicted adult heights generally fell within the standard ±2-inch margin typical for healthy children.

However, the study, **"Bone Age Delay in X-linked Hypophosphatemia,"** did identify subtle nuances in these tools. There was a slight tendency for the Bayley-Pinneau method to overestimate height in males, while the Tanner-Whitehouse method trended toward overestimation in females. For clinicians, these findings emphasize that BA delay is a systemic feature of XLH rather than an isolated symptom. The research indicates that while male patients may appear to be "falling behind" on growth charts more rapidly, this lag can be viewed as a predictable byproduct of the disease's pathology.

As precision medicine continues to evolve within the rare disease space, data regarding sex-specific growth patterns allow for more tailored therapeutic approaches. By integrating these specific BA trends into daily clinical practice, healthcare providers can better navigate the complex relationship between phosphate management and skeletal development, ultimately improving long-term physical outcomes for children living with XLH. — *Jackie Oberst*

> **"By integrating these specific bone age trends into daily clinical practice, healthcare providers can better navigate the complex relationship between phosphate management and skeletal development, ultimately improving long-term physical outcomes for children living with XLH."**

# CGM Cuts Readmission Risks

A new prospective study has found that initiating continuous glucose monitoring (CGM) at the point of hospital discharge is associated with significantly improved glycemic control and may halve the risk of hospital readmission for patients with type 2 diabetes. The research, published in the *Journal of the Endocrine Society*, suggests that providing patients with real-time data during the high-risk transition from inpatient to home care is both feasible and safe. This clinical "bridge" addresses a long-standing gap in diabetes management where patients often struggle to maintain the stability achieved under professional supervision once they return to their daily routines.

The study, **"Effect of Continuous Glucose Monitoring Following Hospital Discharge of Patients With Type 2 Diabetes,"** conducted by researchers at The Ohio State University Wexner Medical Center, focused on 108 hospitalized adults with poorly controlled type 2 diabetes (HbA1c > 8.0%) who required basal insulin therapy. By equipping participants with a Dexcom G6 CGM system upon leaving the hospital, clinicians were able to monitor their transition over a 12-week period. The results were striking: Average HbA1c levels plummeted from an initial median 12.0% to 8.2% by the conclusion of the study. This rapid improvement underscores the transformative power of real-time biofeedback in patient self-management.

This transition period is particularly critical because the weeks following hospital discharge are often fraught with medication errors and fluctuating glucose levels. Traditionally, initiation of CGM is deferred to the outpatient setting, and patients rely on intermittent finger-stick tests, which offer only a disconnected snapshot of their metabolic state. In contrast, CGM provides a continuous stream of data, allowing for immediate adjustments to insulin dosing and diet. By visualizing how specific meals or activities impact their blood sugar, patients can make informed decisions in realtime, effectively preventing the dangerous "peaks and valleys" that often lead to re-hospitalization.

The data revealed that patients who consistently utilized the CGM technology were significantly more stable than those who did not. Most notably, the readmission rate within the 12-week follow-up period was just 23% for those with consistent CGM data, compared to 50% for those without. Furthermore, patients equipped with the device were nearly eight times more likely to follow up with an outpatient endocrinologist (49% vs. 6%), suggesting either a need for ongoing diabetes-focused care in CGM users or potentially that CGM promotes better engagement with the healthcare team.

"Initiating CGM at hospital discharge was feasible, safe, and associated with significant glycemic improvement," the researchers concluded. The study noted that time in range (TIR) — the percentage of time a patient's glucose stays between 70 and 180 mg/dL — increased steadily throughout the 12 weeks, moving from 37% to 43%. This improvement, if sustained, is a vital indicator of reduced long-term complications, such as nerve damage and kidney disease. As healthcare systems look for ways to reduce the burden of chronic disease management, these findings highlight CGM as a potential standard of care for the transition period. By providing a digital safety net, hospitals can empower patients to manage their diabetes more effectively, ensuring that the progress made during a hospital stay is not lost once the patient returns home.

*— Jackie Oberst*


"As healthcare systems look for ways to reduce the burden of chronic disease management, these findings highlight CGM as a potential standard of care for the transition period. By providing a digital safety net, hospitals can empower patients to manage their diabetes more effectively, ensuring that the progress made during a hospital stay is not lost once the patient returns home."

# SURMOUNT-1 Data Reveals Tirzepatide's Power to Overcome Most Common Genetic Form of Obesity

> "For years, a diagnosis of MC4R deficiency felt like a metabolic dead end. These data show that tirzepatide's dual-action mechanism provides a signal to the brain powerful enough to compensate for the underlying genetic defect. We are essentially surmounting a mountain that was previously unscalable."

A popular weight-loss medication has proven highly effective at treating the most common genetic form of obesity, according to a new analysis of clinical trial data. The study, **"Tirzepatide leads to weight reduction in people with obesity due to MC4R deficiency,"** published in *Nature Medicine*, reveals that tirzepatide — marketed under the brand names Mounjaro and Zepbound — helps individuals with melanocortin 4 receptor (MC4R) deficiency lose nearly 20% of their body weight, effectively "overcoming" a genetic predisposition once thought to be resistant to traditional interventions, such as diet and exercise.

The findings stem from a rigorous subanalysis of the SURMOUNT-1 clinical trial, a landmark Phase 3 study that showed "surgery-level" weight loss through medication alone. Conducted across 119 sites in nine countries, the 72-week trial enrolled 2,539 adults with obesity or overweight who did not have diabetes. SURMOUNT-1 was designed to evaluate the efficacy of tirzepatide, a first-in-class dual agonist that mimics two natural hormones: glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1). While the main trial showed participants on the highest dose (15 mg) lost an average of 20.9% of their body weight, this new post-hoc analysis specifically focused on the "genetic outliers" within that group.

Researchers investigated the clinical response of participants carrying "pathogenic" or "likely pathogenic" mutations in the MC4R gene. These individuals achieved an average weight reduction of 18.3%, a result that nearly mirrors the 19.9% weight loss seen in participants without the mutation. This discovery proves that modern dual-agonist therapies can bypass deep-seated biological hurdles that previously made "surgery-level" weight loss impossible for this population.

MC4R deficiency is the most common monogenic cause of obesity, affecting approximately one in 100 people with severe weight issues. The mutation disrupts a critical "satiety switch" in the brain, leading to "hyperphagia" — an insatiable, driving hunger. Because this defect is hardwired into the central nervous system, these patients have historically faced an uphill battle, often finding it impossible to lose weight through diet, exercise, or older generations of medication, such as amphetamine and orlistat.

"For years, a diagnosis of MC4R deficiency felt like a metabolic dead end," the study's lead researchers write. "These data show that tirzepatide's dual-action mechanism provides a signal to the brain powerful enough to compensate for the underlying genetic defect. We are essentially surmounting a mountain that was previously unscalable."

The study analyzed a cohort of 2,291 participants, identifying 32 individuals (1.4%) with these specific genetic markers. Despite starting with a more severe metabolic profile — averaging a body mass index (BMI) of 40 — their trajectory of weight loss remained remarkably consistent with the rest of the study population.

The SURMOUNT-1 data suggests that even the most "fixed" genetic traits are now targetable through pharmacological innovation, proving that for millions, biology is no longer destiny. By effectively surmounting the genetic barriers of the MC4R mutation, tirzepatide is ushering in an era where weight loss is a matter of chemistry rather than just willpower. — *Jackie Oberst*

# Hyperinsulinemia Emerges as Critical Predictor of Severe Liver Outcomes

Researchers have identified fasting hyperinsulinemia as a primary, yet often overlooked, driver of metabolic dysfunction-associated steatotic liver disease (MASLD). A new review published in *Hepatology* suggests that elevated insulin levels are not merely a symptom of metabolic syndrome but a direct contributor to liver fibrosis and a potent predictor of major adverse liver and cardiovascular events.

The study, **"Hyperinsulinemia, an overlooked clue and potential way forward in metabolic dysfunction–associated steatotic liver disease,"** led by researchers from the Radcliffe Department of Medicine at the University of Oxford, highlights a dangerous feedback loop between the liver and the pancreas. In patients with MASLD, the liver often fails to clear insulin from the bloodstream effectively. This reduced hepatic insulin clearance leads to chronic hyperinsulinemia, which in turn accelerates the progression of liver fibrosis — the most significant predictor of mortality and severe liver outcomes in metabolic patients.

Historically, clinical focus has remained largely on insulin resistance and blood glucose levels. However, this research argues that the absolute level of fasting insulin provides a unique window into liver health. When the liver's ability to adjust peripheral insulin levels is compromised, it signals a decline in hepatic function that precedes many traditional diagnostic markers. This metabolic shift marks a transition from simple fat accumulation to more aggressive tissue damage.

"The associated fasting hyperinsulinemia has been independently associated as a predictor of major adverse liver outcomes (MALO) and major adverse cardiovascular events (MACE)," the authors noted. This finding suggests that measuring fasting insulin could serve as a non-invasive "hepatic functional test," providing clinicians with a low-cost tool to identify high-risk patients before irreversible scarring occurs. By tracking these levels, physicians can better anticipate the risk of cirrhosis or liver failure in patients who might otherwise appear stable.

The implications for patients with type 2 diabetes and metabolic syndrome are significant. Because MASLD is so closely entwined with these conditions, the researchers hypothesize that managing insulin levels directly — rather than just focusing on glucose control — could be a way forward in treating steatotic liver disease. This shift in perspective moves hyperinsulinemia from a "background" metabolic feature to a central target for therapeutic intervention, potentially utilizing newer agents that improve metabolic clearance.

As the global prevalence of metabolic syndrome continues to rise, the need for reliable non-invasive tests (NITs) has never been greater. By adding fasting insulin to the current "armamentarium" of diagnostic tools, healthcare providers may be better equipped to assess the entanglement between liver fibrosis and metabolic dysfunction. This approach offers a more holistic view of the patient's health, bridging the gap between endocrinology and hepatology.

The review concludes that recognizing the role of reduced insulin clearance and subsequent hyperinsulinemia offers a potential path toward more personalized treatment strategies. Integrating these measures into routine clinical practice could allow for earlier intervention, potentially preventing the progression from simple fatty liver to cirrhosis and cardiovascular disease. Ultimately, prioritizing insulin clearance could redefine the standards of care for millions of patients at risk of chronic liver failure.

*— Jackie Oberst*

"Prioritizing insulin clearance could redefine the standards of care for millions of patients at risk of chronic liver failure."

# Endocrine Society Elects Wu as 2027 – 2028 President

Joy Wu, MD, PhD

Endocrine Society members elected Joy Wu, MD, PhD, of the Stanford University School of Medicine in Stanford, Calif., as its 2027 – 2028 president. She will serve as president-elect for a year beginning in June 2026 before becoming president in June 2027.

Wu is the Gerald M. Reaven, MD, Professor of Endocrinology, chief of the Division of Endocrinology, and vice chair of basic science in the Department of Medicine at Stanford. She is a board-certified endocrinologist who specializes in treating osteoporosis and other bone and mineral diseases. She has a special interest in optimizing skeletal health for those at risk of bone loss from cancer therapies.

Wu directs a basic and translational research program that focuses on skeletal development and the bone marrow hematopoietic niche. Her laboratory is currently studying stem cell therapies for bone formation and the prevention of cancer metastases to bone.

She is an active member of the Endocrine Society who has served on the Society's Board of Directors as well as several committees and task forces. She was a member of the Society's Hypercalcemia of Malignancy Guideline Writing Committee and currently serves on its Bone and Mineral Special Interest Group.

Wu will begin her term as president-elect following **ENDO 2026**, the Society's annual meeting taking place June 13 – 16, 2026, in Chicago, Ill.

# Endocrine Society Congratulates 2026 Early Investigator Award Winners

On March 18, the Endocrine Society announced the five recipients for its 2026 Early Investigator Awards.

The Early Investigator Awards were established to help develop early-career investigators and recognize their accomplishments in endocrine-related research. Recipients will receive a $1,500 monetary award, complimentary registration and the opportunity to present at **ENDO 2026**, one year of free membership to the Society, and public recognition of research accomplishments in various Society platforms.

The Endocrine Society's 2026 Early Investigator Award winners are:

**Sreekant Avula, MD, FACP, Hennipen Healthcare and the University of Minnesota, Minneapolis, Minn.** — Avula is an endocrinologist at Hennepin


Sreekant Avula, MD, FACP


Emily Hilz, PhD


Stéfanie Parisien-La Salle, MD, FRCPC


Jagriti Upadhyay, MD, FACP, ECNU


Qilin Zhang, MD, PhD, MMSci

Healthcare and an assistant professor at the University of Minnesota. He specializes in diabetes, thyroid disorders, and endocrine emergencies. He established the thyroid biopsy clinic and introduced molecular testing for thyroid cancer at Hennepin Healthcare. He mentors fellows and residents and conducts outcomes research using national databases to improve endocrine care.

**Emily Hilz, PhD, University of Texas, Austin, Texas** — Hilz is a postdoctoral research fellow in the Division of Pharmacology and Toxicology at the University of Texas at Austin. As a behavioral neuroendocrinologist, her research examines how early-life environmental exposures disrupt neurodevelopment and metabolism across generations. Her work combines behavioral, endocrinological, and neuromolecular methods to understand how endocrine-disrupting chemicals promote comorbid disease, such as co-occurring obesity and attention-deficit/hyperactivity disorder (ADHD).

**Stéfanie Parisien-La Salle, MD, FRCPC, Centre hospitalier de l'Université de Montréal (CHUM), Quebec, Canada** — Parisien-La Salle is an endocrinologist and clinician-scientist at CHUM who specializes in adrenal disease. She is currently completing her PhD on the genetics of adrenal diseases and participates in the Clinician-Scientist Program at CHUM. Her research examines factors contributing to the variable clinical presentation of primary aldosteronism, with the long-term aim of improving detection through screening programs.

**Jagriti Upadhyay, MD, FACP, ECNU, of Lahey Hospital & Medical Center, Burlington, Mass., and UMass Chan Medical School in Worcester, Mass.** — Upadhyay is an endocrinologist focused on diabetes and metabolic disorders. She serves as an academic vice chair and an associate program director at the Lahey Hospital & Medical Center, and as an assistant professor at UMass Chan Medical School. Her work includes continuous glucose monitoring (CGM) studies and innovative care delivery research that empower primary care. She also conducts pituitary research.

**Qilin Zhang, MD, PhD, MMSci, Mass General Brigham, Boston, Mass., and Huashan Hospital, Shanghai, China** — Zhang is an endocrine researcher in the Division of Endocrinology, Diabetes, and Metabolism at Mass General Brigham and an associate professor of neurosurgery at Huashan Hospital. His research focuses on pituitary neuroendocrine tumors and integrates multi-omics, molecular imaging, and large international clinical cohorts to advance molecular classification, improve precision diagnosis, and enable personalized management of pituitary tumors.

Additional information about these awards and the application process can be found at: **https://www.endocrine.org/awards/early-investigators-awards**.

# Endocrine Society Endorses Bipartisan Bill to Address Insulin Affordability

## INSULIN Act would expand insulin copay cap to commercial market and encourage competition

On March 25, the Endocrine Society endorsed the Improving Needed Safeguards for Users of Lifesaving Insulin Now (INSULIN) Act, a bipartisan bill to address insulin affordability introduced by Sens. Jeanne Shaheen (D-NH), Susan Collins (R-ME), Raphael Warnock (D-GA), and John Kennedy (R-LA).

This historic legislation would cap out-of-pocket insulin costs at $35 per month for people on private insurance, protecting access to this life-saving medication for millions of people with diabetes. The legislation also would create a program to provide insulin to the uninsured.

> “This historic legislation would cap out-of-pocket insulin costs at $35 per month for people on private insurance.”

The INSULIN Act expands the $35 cap on out-of-pocket costs of insulin currently available for Medicare beneficiaries, extending the cap for those with private insurance, and addresses the underlying problems in the insulin market that contribute to escalating prices. The bill also includes provisions ensuring that patients are receiving any insulin rebates and discounts that are normally collected by pharmacy benefit managers (PBMs), and a provision to encourage more competition for generic and biosimilar insulins.

Insulin affordability is a life-or-death matter for millions of people living with diabetes in the United States. People with type 1 diabetes rely on insulin to live, and many people with type 2 take insulin as part of their treatment plan. The U.S. Centers for Disease Control and Prevention estimates 38.4 million people — or 11.6% of the U.S. population — have diabetes. In 2021 alone, nearly one in five American adults with diabetes — about 1.3 million people — rationed their insulin.

“Many people living with diabetes struggle to pay for the insulin they need to survive,” says Endocrine Society Clinical Affairs Core Committee Chair Whitney Goldner, MD. “This important legislation would ensure that people living with diabetes on private insurance are able to access this life-saving medication at no more than $35 per month. The legislation also includes provisions to help people who are uninsured afford their insulin. We are pleased to endorse this bipartisan bill and thank Sens. Shaheen, Collins, Warnock, and Kennedy for their commitment to addressing this urgent issue.”

The INSULIN Act aligns with recommendations in the Society’s Insulin Access and Affordability Position Statement, which calls for lowering the price of insulin through rebate reform and limiting copays to no more than $35 per month for insulin.

Here is a more detailed breakdown of the policies in the legislation to improve access and affordability of insulin:

- Ensuring group and individual health plans waive any deductible and limit cost sharing to no more than $35 per month or 25% of list price, for at least one insulin of each type and dosage form.
- Mandating pharmacy benefit managers (PBMs) pass through 100% of insulin rebates and other discounts to insurance plan sponsors so that patients can share in any savings.
- Promoting competition from generic and biosimilar drugs.
- Creating a competitive grant program that would provide 10 states with funds to create programs to identify people with diabetes who are uninsured and provide them with insulin.
- Establishing an insulin resource center and hotline for people with diabetes who are uninsured to connect them with resources about diabetes and programs to help them secure insulin.

The Endocrine Society looks forward to working with Congress to ensure the legislation is passed this year. EN

> Adrenal research has advanced significantly over the past two decades, particularly in uncovering the molecular mechanisms behind adrenal tumors and congenital adrenal disorders. **Still, important gaps remain. Rare adrenal diseases are still underrepresented in large-scale studies, and clinical care often relies on limited evidence or extrapolation from other patient populations."**
>
> **Emilia Modolo Pinto, PhD,** a researcher in the Department of Pathology at St. Jude's Children's Research Hospital, Memphis, Tenn., in **"Adrenal All Stars,"** on page 30.


The percentage of children receiving daily growth hormone injections who reported therapy-related stress, linked to factors such as fear of needles and discomfort with peers.

— **SOURCE:** *FRONTIERS IN ENDOCRINOLOGY*


The percentage of accuracy of AI-powered mobile retina tracker in screening for diabetic eye disease.

**SOURCE:** AIM DOCTOR


The starting salary range of endocrinologists in the United States.

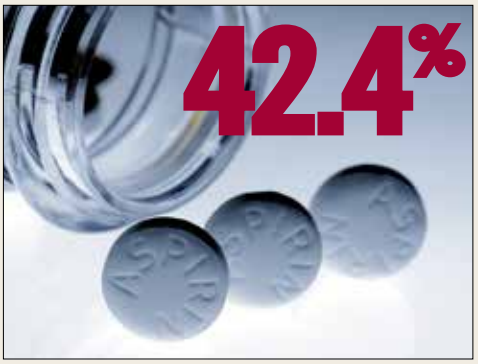
**SOURCE:** ARTI THANGUDU, MD, CEO/FOUNDER OF HEYHEALTHY & COMPLETE MEDICINE


More than 97% of U.S. adults have at least one chemical in their body that is known to disrupt their hormone system.

**SOURCE:** PEW RESEARCH

The percentage reduction in heart attack risk among adults with diabetes who regularly took low-dose aspirin.

**SOURCE:** AMERICAN HEART ASSOCIATION





A recent study confirmed that women who had their first period before age 10 were more likely to develop obesity, high blood pressure, diabetes, heart problems, and reproductive issues like pre-eclampsia later in life.

**SOURCE:** BRAZILIAN LONGITUDINAL STUDY OF ADULT HEALTH (ELSA-BRAZIL)


Obesity-related cancer deaths have tripled in the United States over the past two decades.

**SOURCE: ENDO 2025**
PRESENTATION BY FAIZAN AHMED, MD, OF HACKENSACK MERIDIAN JERSEY SHORE UNIVERSITY MEDICAL CENTER IN NEPTUNE CITY, N.J.

# ENDO 2026

## Chicago, Ill. • June 13 – 16, 2026


We hope to see you at **ENDO 2026**, taking place June 13 – 16, 2026, in Chicago, Ill. With more than 7,000 attendees, nearly 2,000 abstracts, and more than 200 other sessions, **ENDO** is the top global meeting on endocrinology research and clinical care. **ENDO** provides the opportunity to collaborate with an unparalleled list of endocrinologists, healthcare practitioners, and leading scientists from around the world. Through sharing our experience, advice on patient care, and new advances in research, we move the needle forward in hormone health and science. Our outstanding slate of world-renowned speakers will showcase the most cutting-edge advances in research and medicine, with presentations spanning the spectrum of science, clinical care, and social implications.

**https://endo2026.endocrine.org/**

## AAES 2026

**Lexington, Kentucky**
**April 18 – 20, 2026**

The American Association of Endocrine Surgeons 46th Annual Meeting centers around the theme "Strengthening Connections" — reflecting our commitment to deepening professional relationships, fostering interdisciplinary collaboration, and building a stronger, more inclusive endocrine surgery community. The highly rated breakout sessions return with immersive, expert-led content, designed to spark dialogue and collaboration among attendees. The AAES Annual Meeting is dedicated to advancing the science and art of endocrine surgery through knowledge exchange, collaboration, and community, and promises innovative programming, networking opportunities, and scholarly enrichment — all designed to strengthen the connections that make the field thrive.

**https://www.endocrinesurgery.org/2026-annual-meeting-home**

## 2026 Lab Manager Leadership Summit

**Phoenix, Arizona**
**April 20 – 22, 2026**

The 2026 Lab Manager Leadership

Summit is an exclusive event for laboratory leaders and decision makers across clinical, forensic, environmental, food and beverage, pharmaceutical, and life science fields. The Summit offers interactive sessions, hands-on workshops, and insightful presentations designed to elevate your leadership skills. Discover the latest advancements from technology and service providers showcasing innovative lab solutions, connect with industry peers, gain actionable insights, and bring transformative ideas back to your organization. Don't miss this chance to drive your lab forward with confidence and vision!
**https://summit.labmanager.com/leadership/home**

## PES 2026

**San Francisco, California**
**April 30 – May 3, 2026**

The Pediatric Endocrine Society's (PES's) Annual Meeting brings together a diverse international community of more than 1,000 clinicians, researchers, and trainees to share the excitement of new ideas, establish new friendships, and learn the latest insights covering the wide scope of this diverse field.
**https://pedsendo.org/**

## Disorders of Pituitary-Adrenal Function Conference

**Milwaukee, Wisconsin**
**September 30 – October 2, 2026**

Join leading national and international endocrinology expert clinicians for a comprehensive in-person symposium on the diagnosis and management of pituitary and adrenal disorders. This conference will cover the latest advances and future directions of the diagnosis and management of adrenal insufficiency and hypercortisolism.
**https://PituitaryAdrenal2026.eventbrite.com**

## INTERNATIONAL **ITINERARY**

## SICEM 2026

**Incheon, South Korea**
**April 9 – 11, 2026**

The 14th Seoul International Congress of Endocrinology and Metabolism in conjunction with the 45th Annual Scientific Meeting of the Korean Endocrine Society will take place in Incheon, South Korea, April 9 – 11. This year's theme, "Together Toward Tomorrow: Innovation in Endocrinology," embodies our shared aspiration to shape the future of endocrinology through innovation, scientific excellence, and global collaboration. From groundbreaking basic science to the latest clinical practices and technological innovations, the congress will present a comprehensive program that reflects the dynamic progress of our discipline. SICEM 2026 will serve as a forum to foster cross-generational and international collaboration, offering opportunities for young investigators to build new networks and for established experts to exchange ideas that will set new directions for the field.
**https://www.sicem.kr/**

## ICE 2026/JES 2026

**Kyoto, Japan**
**June 2 – 6, 2026**

The joint 22nd International Conference of Endocrinology/99th Annual Congress of the Japan Endocrine Society will take place June 2 – 6 in Kyoto, Japan, with the theme of "Enlightened Endocrinology in Unprecedented Times." In the midst of these unprecedented times, we will gather in Kyoto to discuss the new century of clinical and basic research in various fields of endocrinology. Participants from all over the world are encouraged to present cutting-edge science from their respective countries, and through active discussions, we hope that you will experience the "Enlightened Endocrinology" of endocrinology in this unprecedented era.
**https://icecongress.com/**

## Global Summit on Diabetes and Endocrinology

**London, United Kingdom**
**June 22 – 23, 2026**

This year's theme is "Trending Medical Research and Recent Developments for Changing Life of Diabetes World." This prestigious event offers a unique platform for diabetologists, endocrinologists, healthcare professionals, academics, and researchers to connect, share insights, and collaborate across global boundaries.
**https://diabetesconference.org/**

BY JACKIE OBERST

# Navigating the Complexities of Congenital Adrenal Hyperplasia

# a *delicate* balance

In the quiet exam rooms of specialized endocrine clinics, a high-stakes balancing act plays out every day. It is a clinical tightrope walk where the safety net is made of synthetic hormones and the stakes are measured in lifelong metabolic health. This is the world of congenital adrenal hyperplasia (CAH), a group of rare genetic disorders that transform the adrenal glands — the body's chemical powerhouses — into sites of profound dysfunction.

The treatment of CAH has evolved from being a childhood disease with high mortality to one where most patients now survive into adulthood. Richard J. Auchus, MD, PhD, professor of internal medicine, Division of Metabolism, Endocrinology & Diabetes (MEND), and chief of the Endocrinology & Metabolism Section at the University of Michigan Medical School, Ann Arbor, Mich., points out that although children with CAH have received effective treatment for years, it is only over the past two to three decades that many individuals have reached later adulthood, presenting new challenges in adult care.

"Adults with CAH is somewhat of a new disease," Auchus says, mentioning that it is only recently that these patients have been able to navigate complications that occur later in life such as infertility, menopause, and osteoporosis. "When the disease is managed properly during childhood, patients tend to experience fewer complications. Problems usually occur if good endocrinology management is inconsistent and control of the disease is lost."

## The Biological Disruption: What Is CAH?

At its core, classic (severe) CAH is a breakdown in the body's internal hormonal manufacturing line. Due to an autosomal recessive genetic defect — most commonly a deficiency in the enzyme 21-hydroxylase, but there are also deficiencies in enzymes like 11β-hydroxylase, 17α-hydroxylase/17,20-lyase, or 3β-hydroxysteroid dehydrogenase — the adrenal glands are unable to produce cortisol, the "stress hormone" essential for maintaining blood pressure, blood sugar, and immune response.

Because the pituitary gland senses a lack of cortisol, it goes into overdrive, pumping out adrenocorticotropic hormone (ACTH) to stimulate the adrenals. However, since the production line is broken, the building blocks meant for cortisol are diverted into the production of other steroids, most commonly

Constant vigilance is required for both the patient and the clinicians when treating people with congenital adrenal hyperplasia. Early screening, diligent monitoring, and a holistic approach can ensure that complications are kept at bay and the patients can maintain a high quality of life.

**RICHARD J. AUCHUS, MD, PHD**

PROFESSOR OF INTERNAL MEDICINE, DIVISION OF METABOLISM, ENDOCRINOLOGY & DIABETES (MEND), AND CHIEF OF THE ENDOCRINOLOGY & METABOLISM SECTION, UNIVERSITY OF MICHIGAN MEDICAL SCHOOL, ANN ARBOR, MICH.

> *"Adults with CAH is somewhat of a new disease. When the disease is managed properly during childhood, patients tend to experience fewer complications.* ***Problems usually occur if good endocrinology management is inconsistent and control of the disease is lost."***

androgens (male sex hormones). This results in a double-edged sword: a dangerous deficiency in vital steroids and a toxic surplus of androgens.

This biochemical imbalance creates a lifelong "Goldilocks" problem:

1. **Too little medication:** Excess androgens lead to rapid bone aging, premature puberty, and virilization.

2. **Too much medication:** Excessive glucocorticoids (GCs) lead to stunted growth, obesity, and cardiovascular disease.

## The Pediatric Tightrope: Growth and Puberty

For pediatric endocrinologists, the challenge begins at birth. As mentioned in the 2018 Endocrine Society Guidelines for CAH, universal newborn screening via 17-hydroxyprogesterone (17-OHP) levels is "the gold standard" for early detection, preventing fatal salt-wasting crises. However, the following years involve a struggle over height and development timing.

"Until we have a medication that more closely mimics the daily secretion patterns of our own adrenal glands, we have to constantly readjust," says Phyllis Speiser, MD, one of the guideline authors and a pediatric endocrinologist from the Cohen Children's Medical Center of New York at Northwell Health and Feinstein Institutes for Medical Research, Manhasset, N.Y.

The primary tool for treatment remains GCs like hydrocortisone. However, GCs are potent growth inhibitors. If a child is slightly overtreated to suppress androgens, their linear growth slows. Conversely, if undertreated, the excess androgens cause the "growth plates" (epiphyses) in the bones to fuse too early. The result in both scenarios is the same: a significant loss in final adult height.

Furthermore, the androgen surge in poorly controlled CAH can trigger precocious (early) puberty. This is not just a physical change; it carries immense psychological weight for a young child and further complicates the hormonal milieu, often requiring additional medications like GnRH agonists to "pause" puberty while the adrenal management is refined.

## The Cardiometabolic Toll of Treatment

As patients transition into adulthood, the focus shifts from growth to metabolic survival. For decades, the medical community relied on "supraphysiologic" doses of steroids to keep adrenal androgens in check. We now know this comes at a heavy price.

Published in a 2010 *Journal of Clinical Endocrinology & Metabolism* (JCEM) article, the landmark CaHASE study (Congenital Adrenal Hyperplasia Adult Study Executive) in the UK exposed a sobering reality: Many adults with CAH have the metabolic profile of people much older.

The study first exposed the "failure of balance" in adult CAH care, revealing that standard GC treatments often resulted in poor metabolic health (e.g., metabolic syndrome, hypertension, and osteopenia/osteoporosis), stunted growth, and impaired fertility (e.g., PCOS and irregular ovulation in females and testicular adrenal rest tumors in men). CaHASE pushed the medical community to move beyond the hyper-reactive 17-OHP biomarker, which often led to overtreatment. This shift directly paved the way for more stable monitoring through androstenedione and, most recently, the adoption of 11-oxygenated androgens (like 11-ketotestosterone). These newer biomarkers are highly adrenal-specific, allowing clinicians to precisely target androgen excess without the collateral damage of excessive steroid use.

## The High Cost of Poor Control: A Cautionary Tale

A recent case study highlights the extreme consequences of chronic ACTH overstimulation. Published in *JCEM Case Reports*, the study details a patient with poorly controlled CAH who developed giant bilateral adrenal myelolipomas — benign tumors composed of mature adipose tissue and hematopoietic elements.

While small lesions (under 5 cm) are typically left alone, those exceeding 6 cm are classified as "giant" and often require intervention due to the risk of serious complications. The European Society of Endocrinology's (ESE's) clinical practice

### THE MULTIDISCIPLINARY IMPERATIVE

The complexity of CAH — spanning growth, fertility, metabolic health, and surgical risks — requires a patient-centered care team of the following specialists:

| Role | Primary Focus |
|---|---|
| **Endocrinologist** | The "quarterback" managing the GC/mineralocorticoid balance |
| **Pediatrician** | Monitoring velocity of growth and bone age |
| **Reproductive Specialist/Gynecologist** | Addressing fertility, as high progesterone/androgens can impair ovulation and sperm count |
| **Cardiologist** | Managing the long-term risk of hypertension and arterial stiffness |
| **Psychologist** | Addressing the burden of chronic illness and body-image concerns related to puberty and weight gain |

This team-based approach is especially critical during the "transition phase" — when a patient moves from pediatric care to adult medicine. This is the period where many patients "fall off the map," leading to the poor control that causes complications like myelolipomas later in life.

**MARTIN FASSNACHT, MD**

HEAD OF ENDOCRINOLOGY AND DIABETOLOGY AT MEDICAL CLINIC 1 AT THE UNIVERSITY HOSPITAL, WURZBURG, GERMANY

> *"Even in the case of very large myelolipomas that do not cause any symptoms, I would not see a compelling indication for surgery and would only recommend surgery if the patient absolutely wants it.* ***Of course, the risk of rupture of the giant myelolipoma is not zero, but it is not extremely high either. We must be careful not to make patients who are not ill 'unnecessarily' ill."***

guidelines for incidental adrenal masses in 2023 recommended "against adrenal biopsy during workup in any adrenal mass unless there is a history of extra-adrenal malignancy."

Under the relentless lash of high ACTH levels, the adrenal tissue does not just work harder; it morphs. In this specific case, the masses grew to a staggering 30 cm and 27.5 cm — roughly the size of watermelons — filling the abdominal cavity, displacing the kidneys, and compressing the vena cava.

The decision to undergo a bilateral adrenalectomy (removal of both adrenal glands) is a heavy one. It renders the patient permanently dependent on life-sustaining medication with zero internal backup. However, when a mass is displacing organs or causing chronic pain, surgery becomes the only viable path.

"For me, such symptoms would be a reason for surgery and almost the only clear indication for surgery. Even in the case of very large myelolipomas that do not cause any symptoms, I would not see a compelling indication for surgery and would only recommend surgery if the patient absolutely wants it," says Martin Fassnacht, MD, head of endocrinology and diabetology at Medical Clinic 1 at the University Hospital in Wurzburg, Germany, and one of the ESE guideline authors. "Of course, the risk of rupture of the giant myelolipoma is not zero, but it is not extremely high either. We must be careful not to make patients who are not ill 'unnecessarily' ill."

## A New Toolkit: Decoupling Treatment

The most exciting development in 2026 is the emergence of therapies that "decouple" the management of adrenal insufficiency from the suppression of androgens. For 70 years, we used one hammer (steroids) for two different nails. Now, we have specialized tools.

### 1. CRF-1 Antagonists

Drugs like crinecerfont (Crenessity), approved in late 2024 by the U.S. Food and Drug Administration for children as young as four years, block the corticotropin-releasing factor receptor 1 in the pituitary gland. This lowers ACTH production at the source without requiring extra steroids and advances the idea that better control of CAH in children can improve prospects for long-term health.

### 2. ACTH Antagonists

For patients who do not respond to pituitary blockers, newer agents like atumelnant (CRN04894, currently in Phase 3) block the ACTH receptor on the adrenal gland itself. This provides a "safety valve" to prevent the adrenals from overproducing androgens even if ACTH levels remain high.

### 3. Chronotherapy

New delayed-release formulations, such as Efmody, are designed to be taken at bedtime. They release cortisol in the early morning hours to mimic the natural human "dawn phenomenon," suppressing the morning ACTH surge more effectively than traditional tablets.

These new tools are not substitutes but can be used in conjunction with standard medication regimens including hydyrcortisone and fludrocortisone.

"Future guidelines may prioritize non-steroidal adjuncts as first-line therapy for androgen control, fundamentally altering the long-term complication profile of the disease," says Maximilien Rappaport, DO, assistant professor of clinical medicine at the University of South Carolina School of Medicine in Greenville and first author of the *JCEM Case Reports* study.

## A New Era of Care

The journey of a CAH patient is one of resilience. It is a journey that requires constant vigilance from both the patient and a dedicated medical team. The transition from the "brute force" hormone suppression of the past to the "precision management" of today offers hope for better quality of life and fewer surgical complications.

Recent literature offers us clear lessons: We must screen early, monitor precisely, and treat holistically. By integrating the rigorous clinical guideline standards with the multidisciplinary care models advocated by modern researchers, we can ensure that "giant" complications remain a rarity, and that every patient with CAH can live a healthy, balanced life. EN

– OBERST IS A FREELANCE WRITER BASED IN POTOMAC, MD, AND FORMER ASSOCIATE EDITOR OF *ENDOCRINE NEWS*. SHE CONTRIBUTES TO THE MONTHLY TRENDS & INSIGHTS COLUMN.

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BY KELLY HORVATH

# piecing together the adrenal puzzle

# Four Studies That Can Improve Patient Outcomes

Since April is Adrenal Disease Awareness Month, *Endocrine News* is highlighting recent studies that shed light on important advances and insights in the field. These studies, all published in Endocrine Society journals, show how improved diagnostic accuracy, postoperative management, and a better understanding of rare adrenal pathologies offer clinicians tools that could improve patient outcomes.

Given the adrenal glands' enormous hormonal reach — governing inflammation, blood pressure, stress response, and more — when they are dysfunctional, the consequences are serious. According to the Endocrine Society's *Endocrine Facts and Figures*, the prevalence of primary adrenal insufficiency is estimated at 40 to 100 cases per million in the United States, while Cushing syndrome affects an estimated eight people per million in those younger than age 65 years.

Rarer still, Cushing disease occurs in roughly 2.3 to 2.7 cases per million per year, and multiple endocrine neoplasia type 1 (MEN 1) affects an estimated three to 10 people per 100,000. Those numbers may look modest, but behind each one is a clinical journey often fraught with challenges. Two research studies advance our understanding of cortisol testing and postoperative management, while two case reports serve as vivid reminders that the adrenal gland can still surprise even the most experienced clinicians.

## Central Adrenal Insufficiency

In **"CAI Score for the Diagnosis of Central Adrenal Insufficiency,"** published in the *Journal of the Endocrine Society* in February, Mussa H. Almalki, MBBS, MHSc, of the College of Medicine of Alfaisal University in Riyadh, Saudi Arabia, and team have truly moved the needle forward when it comes to day-to-day, in-clinic management. As to what prompted this study, Almalki credits the well-known frustration that comes from wanting to help patients but being hemmed in by existing clinical parameters. "We often see patients who we suspect might have central adrenal insufficiency (CAI) — perhaps they have a pituitary tumor, have had head trauma, or have other hormone deficiencies," he recounts. "We order a morning cortisol test, hoping for a clear answer. But so often, the result comes back in what we call the 'gray zone' — typically between 4 and 18 μg/dL. It's not low enough to confidently diagnose CAI, but it's not high enough to rule it out."

Mussa H. Almalki, MBBS, MHSc

> Endocrinology is a field defined by complex, interacting feedback loops. A single lab value rarely tells the whole story. AI-assisted tools are perfectly suited to integrate multiple data points — labs, imaging, symptoms, other diagnoses — and recognize patterns that are too subtle or complex for the human brain to consistently process. **I see these tools not as replacing the endocrinologist, but as powerful allies that will handle the 'noise' and allow us to focus on the 'signal.'"**
>
> — MUSSA H. ALMALKI, MBBS, MHSC, COLLEGE OF MEDICINE, ALFAISAL UNIVERSITY, RIYADH, SAUDI ARABIA

This dilemma generally creates the need to order a dynamic test (e.g., short Synacthen test [SST]), but this, says Almalki, is time-consuming, requires patients to come to a dedicated unit, can be unpleasant, and is not a perfect test itself. "We realized we needed a better way to stratify risk in these 'gray zone' patients before deciding on next steps. We wanted to see if we could combine the information we already had — like the specific cortisol level, the presence of other pituitary issues, and imaging findings — to build a more sophisticated tool than just looking at the cortisol number in isolation. The goal was to help clinicians make a more informed, data-driven decision about who truly needs that dynamic test."

For their retrospective single-center study from a Riyadh tertiary referral center, the team enrolled 341 adults with suspected CAI and indeterminate morning cortisol levels, using the SST as the reference standard for diagnosis. They developed and validated a predictive scoring system that integrates morning cortisol levels, pituitary hormone deficits, tumor size, sex, and treatment history to help stratify CAI risk in the diagnostically challenging "gray zone" where cortisol results alone are inconclusive. Where traditionally, the "gray zone" is defined as about 3 to 15 µg/dL, the team deliberately expanded it to 4 to 18 µg/dL to be useful in the real world, where different labs use different cutoffs. "But more importantly," explains Almalki, "we know a cortisol of 5 µg/dL isn't the same as 15 µg/dL, even if both are 'gray.' By widening the range, we could let the data show us how risk changes as cortisol drops, rather than forcing it into arbitrary boxes."

The resulting tool — the CAI score — which also incorporates a machine-learning model and is freely available as a web-based application, demonstrated stronger diagnostic accuracy than morning cortisol alone. Along the way, the researchers encountered a couple of surprises. The first was what Almalki calls "the sheer power of pituitary hormone deficits." In their model, having three or more additional hormone deficiencies was a very strong predictor (odds ratio >35). "This really drove home the point that CAI is very rarely an isolated event. It's often a sign of more widespread pituitary damage. The health of the pituitary gland as a whole is a massive clue to corticotroph function," he says. The second was the comparatively modest role tumor size played. "While larger tumors did increase the risk, size wasn't as powerful a predictor as the number of other hormone deficits. This suggests that it's not just the size of the tumor, but how it's impacting the function of the surrounding healthy pituitary tissue — as evidenced by the other hormone losses — that truly matters for CAI risk," explains Almalki.

The future for the CAI score certainly looks promising, but two things need to happen for its widespread adoption, according to Almalki: "First, external validation — seeing the model perform consistently across different hospitals and patient populations. Second, demonstrating practical value. If we can

show that using the score reduces unnecessary testing, saves money, and doesn't compromise patient safety, that creates a compelling case for integration into electronic health records or clinical workflows." The team is not actively pursuing additional related studies because, as Almalki puts it, "My immediate focus is shifting toward clinical application and direct patient care, rather than driving the next prospective study. I'm happy to leave the door open for other researchers to pick this up and validate it if they see value in it."

As for the importance of integrating artificial intelligence (AI)-assisted tools in medicine, these researchers emphasize such tools are intended to support rather than replace clinical judgment. "Endocrinology is a field defined by complex, interacting feedback loops. A single lab value rarely tells the whole story. AI-assisted tools are perfectly suited to integrate multiple data points — labs, imaging, symptoms, other diagnoses — and recognize patterns that are too subtle or complex for the human brain to consistently process. I see these tools not as replacing the endocrinologist, but as powerful allies that will handle the 'noise' and allow us to focus on the 'signal,'" Almalki says.

Finally, for those clinicians similarly frustrated by how to manage a condition in the face of ambiguous results, Almalki has actionable advice: "Stop looking at that gray-zone cortisol in isolation. It's just one piece of the puzzle. Ask yourself: How low is it? Do they have other hormone issues? What does their MRI show? The CAI score just helps you put those pieces together quickly. A low score might save a patient an unnecessary test. A high score tells you to stop messing around and act. It's free, it's fast, and you can use it right now on the website." (Go to: **https://cai-predictor.streamlit.app/**)

## Post-Adrenalectomy Adrenal Insufficiency

In **"Cortisol Testing to Diagnose Adrenal Insufficiency Following Adrenalectomy for Mild Autonomous Cortisol Secretion,"** published just last month in *The Journal of Clinical Endocrinology & Metabolism*, a team of researchers led by Oksana Hamidi, DO, MSCS, associate professor of medicine of the University of Texas Southwestern Medical Center in Dallas, Texas, and corresponding author Irina Bancos, MD, MSc, professor of medicine and Adrenal Lab principal investigator of the Mayo Clinic in Rochester, Minn., sought contemporary data using standardized cortisol thresholds and modern assays on the true prevalence and duration of adrenal insufficiency after adrenalectomy for mild autonomous cortisol secretion (MACS). "Prior studies were heterogeneous, and there remains uncertainty about the optimal postoperative testing strategy," say Hamidi and Bancos. "Specifically, we aimed to clarify three issues: (1) how often adrenal insufficiency occurs after unilateral adrenalectomy for MACS; (2) whether basal cortisol alone is sufficient, or whether cosyntropin stimulation testing adds value; and (3) whether biochemical/clinical severity correlates with postoperative adrenal suppression and recovery."

The impetus for quantifying these aspects of post-adrenalectomy adrenal insufficiency is patient driven. When recognized and treated appropriately, explains Bancos, this condition is manageable. It becomes problematic, however, when it is unrecognized or unnecessarily prolonged or when patients are empirically treated without appropriate testing. In these situations, patients can experience glucocorticoid withdrawal symptoms, like fatigue, myalgias, and mood changes, that can significantly affect daily functioning. "During this time, patients require education, structured tapering, and close follow-up," continues Bancos. "Importantly, glucocorticoid withdrawal occurs not due to adrenal insufficiency, but due to the abrupt decline in supraphysiologic cortisol before adrenalectomy and lower, more physiologic cortisol levels after adrenalectomy. In this paper, we have not investigated glucocorticoid withdrawal, but we did previously report it in other studies."

Zeroing in on empiric glucocorticoid therapy, why wouldn't all post-adrenalectomy patients benefit? This team advocates for reserving such treatment for those who truly need it rather than exposing all to steroid hormone exposure with its potential adverse effects — including osteoporosis and bone fractures, increased risk of infections, hyperglycemia/diabetes, weight gain, Cushingoid

Irina Bancos, MD, MSc

> Biochemical severity and age were strong predictors, yet one critical variable we cannot accurately measure is the duration of cortisol autonomy. **MACS is often missed and detected incidentally, making disease duration uncertain."**
>
> — IRINA BANCOS, MD, MSC, PROFESSOR OF MEDICINE AND ADRENAL LAB PRINCIPAL INVESTIGATOR OF THE MAYO CLINIC, ROCHESTER, MINN.

features, hypertension, myopathy, cataracts/glaucoma, and mental health issues.

Their multicenter retrospective study examined 281 patients with MACS, 80% female with a median age of 57 across five U.S. institutions and compared the diagnostic utility of two postoperative cortisol tests: basal cortisol and the cosyntropin stimulation test (CST). Slightly more than half of patients developed postoperative adrenal insufficiency, with younger age (<60 years) and higher biochemical severity scores (BSS) emerging as key risk factors, and a 22% discordance rate between the two tests — highest in patients with bilateral adrenal nodules — supporting the case for using both assessments together. Their data suggest that adrenal insufficiency reflects the degree of preoperative hypothalamic–pituitary–adrenal (HPA) axis suppression. In unilateral disease, for example, prolonged cortisol autonomy leads to suppression and partial atrophy of the contralateral adrenal gland, which may not recover after surgery.

To account for the increased severity among younger patients, Bancos elaborates: "A possible explanation is that younger individuals may have more biochemically active or more prolonged unilateral disease, resulting in deeper HPA suppression. This requires further study." Higher BSS also correlated with duration of recovery: Patients with mild scores recovered in approximately three months, whereas those with more severe scores required longer (4–14 months).
Age being a strong predictor and the discordancy between tests surprised the researchers, but both findings led to critical insights. "First, basal cortisol and CST were discordant in 22% of patients. This suggests that relying on a single test may misclassify a meaningful subset of patients," say Hamidi and Bancos. "Second, the strong inverse association with age was unexpected. That challenges prior assumptions and highlights the need for further prospective validation."

Ultimately, their findings could influence endocrinology practice. "Adrenal insufficiency is not intolerable when it is anticipated, explained, and carefully managed," say Hamidi and Bancos. The implication is clear — implement earlier testing. Although the exact optimal timing of testing in the first weeks after surgery remains an area for further research, Hamidi and Bancos say, "our findings support structured reassessment beginning around four to six weeks postoperatively and continuing at regular intervals. Earlier reassessment may prevent unnecessary prolonged glucocorticoid exposure in patients who recover quickly."

Importantly, the scores that come from this earlier testing can inform individualized approaches to management. "Instead of speaking in generalities, we can now say: 'Based on your biochemical severity, you have a higher likelihood of needing temporary steroid replacement, and recovery may take several months. That improves preparedness and shared decision-making,'" says Bancos.

Postoperative stratification is thus clearly beneficial, but what about a validated preoperative risk score? The authors explain that, while possible, a preoperative score would have built-in limitations. "Biochemical severity and age were strong predictors, yet one critical variable we cannot accurately measure is the duration of cortisol autonomy. MACS is often missed and detected incidentally, making disease duration uncertain," Bancos says. "While a predictive model could help stratify risk, I do not anticipate that any preoperative score would eliminate the need for postoperative cortisol testing. Objective biochemical assessment remains essential."

The team has several avenues to pursue from here, thanks to their ongoing prospective cohort, which allows them to validate predictors of duration and recovery more rigorously. "Future directions include refining recovery trajectories using longitudinal ACTH and cortisol modeling, exploring mechanistic explanations for age-related differences, developing and validating risk prediction tools, and standardizing postoperative testing protocols across centers," says Bancos.

## Rare Presentations, Important Lessons

The two case reports, both published in *JCEM Case Reports* in March 2025, arrive at the same uncomfortable truth: that adrenal pathology can be diagnostically ambiguous.

In **"Adrenocorticotropin-Secreting Pure Adrenal Ganglioneuroma Leading to Cushing Syndrome,"** corresponding author Daniel Alban, MD, of the Icahn School of Medicine at Mount Sinai in New York, N.Y., and team describe the second-only documented instance of an ACTH-producing pure adrenal ganglioneuroma (AGN) causing ACTH-dependent Cushing syndrome. (AGNs are typically benign, slow-growing, and hormonally inactive.)

When a 23-year-old man presented to the team with hypertension, a right adrenal mass, anxiety, and excessive sweating, and laboratory workup demonstrated ACTH-dependent hypercortisolism, with elevated 24-hour urinary free cortisol and failure to suppress on low-dose dexamethasone suppression testing, they suspected pheochromocytoma, a known precipitator of an ACTH-dependent hypercortisolemic state. However, normal plasma metanephrines and magnetic resonance imaging (MRI) of his pituitary undermined this working diagnosis without suggesting another cause of the hypercortisolism, prompting the team to pursue right adrenalectomy.

Subsequent pathologic examination revealed a pure AGN, confirmed by positive ACTH immunostaining. This finding is remarkable not only for its rarity but also for what it suggests about microenvironmental influence on neoplastic behavior in that the authors hypothesize that the tumor's location in the adrenal medulla may have exposed it to

# AT A GLANCE

- **The central adrenal insufficiency (CAI) score improves diagnostic accuracy in ambiguous cases of suspected CAI by integrating morning serum cortisol with key clinical parameters and can help guide treatment decisions.**
- **Two-pronged testing consisting of basal cortisol and cosyntropin levels initiated as early as four weeks post-adrenalectomy can identify patients with adrenal insufficiency, guide glucocorticoid treatment, and obviate unnecessary glucocorticoids.**
- **Although typically benign and nonsecretory, adrenal ganglioneuromas (AGNs) can rarely exhibit secretory properties that mimic other adrenal pathologies, making definitive histopathologic assessment essential; in cases of ACTH-dependent hypercortisolism with an adrenal lesion, secretory AGN should remain on the differential.**
- **(MEN 1)-associated adrenocortical carcinoma requires comprehensive hormonal evaluation, regular follow-up for adrenal lesions, and routine screening of asymptomatic mutation carriers for early detection and improved outcomes.**

Oksana Hamidi, DO, MSCS

> Prior studies were heterogeneous, and there remains uncertainty about the optimal postoperative testing strategy. Specifically, we aimed to clarify three issues: **(1) how often adrenal insufficiency occurs after unilateral adrenalectomy for MACS; (2) whether basal cortisol alone is sufficient, or whether cosyntropin stimulation testing adds value; and (3) whether biochemical/clinical severity correlates with postoperative adrenal suppression and recovery."**
>
> — OKSANA HAMIDI, DO, MSCS, (PICTURED) ASSOCIATE PROFESSOR OF MEDICINE, UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL CENTER, DALLAS, TEXAS; IRINA BANCOS, MD, MSC, PROFESSOR OF MEDICINE AND ADRENAL LAB PRINCIPAL INVESTIGATOR OF THE MAYO CLINIC, ROCHESTER, MINN.

local corticotropin-releasing hormone, potentially stimulating ACTH production.

Postoperatively, the patient's blood pressure normalized without antihypertensive medication, and his urinary free cortisol returned to normal. As this case demonstrates, AGNs present numerous diagnostic challenges: They are capable of demonstrating secretory properties with clinical presentations that vary based on the hormone(s) involved, secretory AGNs often mimic other adrenal pathologies (particularly pheochromocytomas), and definitive diagnosis requires histopathologic assessment. Moreover, it alerts clinicians to include ACTH-secreting AGN in the differential diagnosis when evaluating ACTH-dependent hypercortisolism in the presence of an adrenal lesion, even when the biochemical picture seems to point elsewhere.

In **"Multiple Endocrine Neoplasia Type 1 With Adrenal Cortical Adrenocortical Carcinoma: A 25-Year Follow-Up and Family Report,"** Mei Yang, MD, and team of the Third People's Hospital of Chengdu, in Chengdu, China, describe a 49-year-old woman who presented with recurrent hypoglycemia and was found on workup to have insulinoma, primary hyperparathyroidism, and a massive (>10 cm) left adrenal mass producing ACTH-independent hypercortisolism. Combined with her 25-year history of surgically treated pituitary macroprolactinoma, this constellation of symptoms pointed to MEN1, and genetic testing confirmed a heterozygous mutation in the MEN 1 gene. On pathology, her adrenal tumor proved to be a rare and aggressive mucinous adrenocortical carcinoma.

Despite surgery (adrenalectomy and distal pancreatectomy), the patient died from postoperative sepsis and septic shock, complications for which her concurrent Cushing syndrome increased her risk. Though sobering, this case has positive reverberations. Subsequent genetic testing of family members revealed that her 11-year-old son also carries the MEN 1 mutation, which itself confers a high likelihood of future tumor development. The authors emphasize that this is precisely why genetic testing and family screening matter — not only for diagnosis, but also for the early detection that can change outcomes.

Taken together, these four studies fill in important pieces to a puzzle that, for patients with adrenal disease, can have profound consequences when left unsolved. EN

– HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. IN THE MARCH ISSUE, SHE WROTE ABOUT HOW GLP-1S HAVE BEEN HELPING OTHER CONDITIONS ASIDE FROM DIABETES AND OBESITY.


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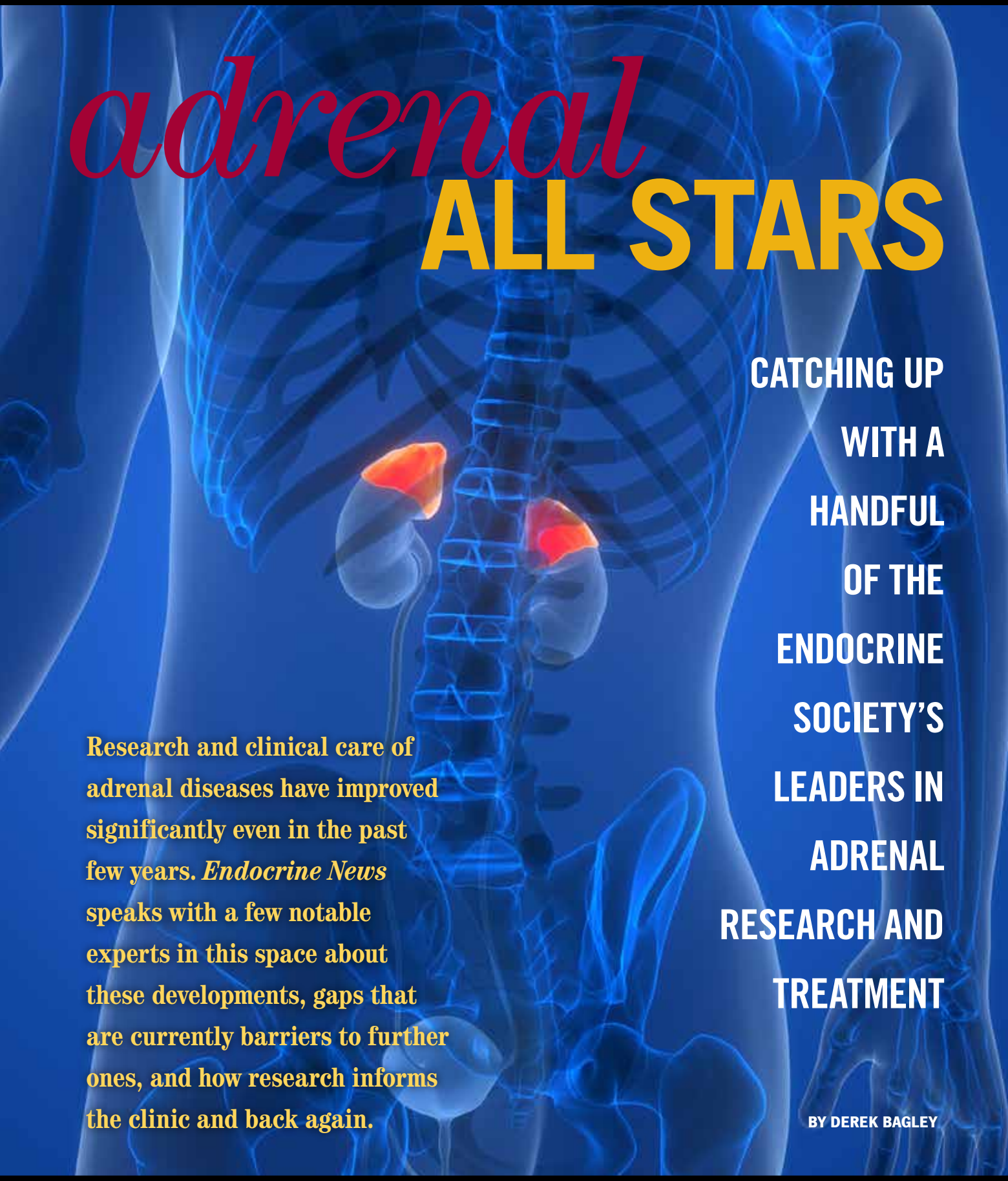


# *adrenal* ALL STARS

## CATCHING UP WITH A HANDFUL OF THE ENDOCRINE SOCIETY'S LEADERS IN ADRENAL RESEARCH AND TREATMENT

**Research and clinical care of adrenal diseases have improved significantly even in the past few years. *Endocrine News* speaks with a few notable experts in this space about these developments, gaps that are currently barriers to further ones, and how research informs the clinic and back again.**

BY DEREK BAGLEY

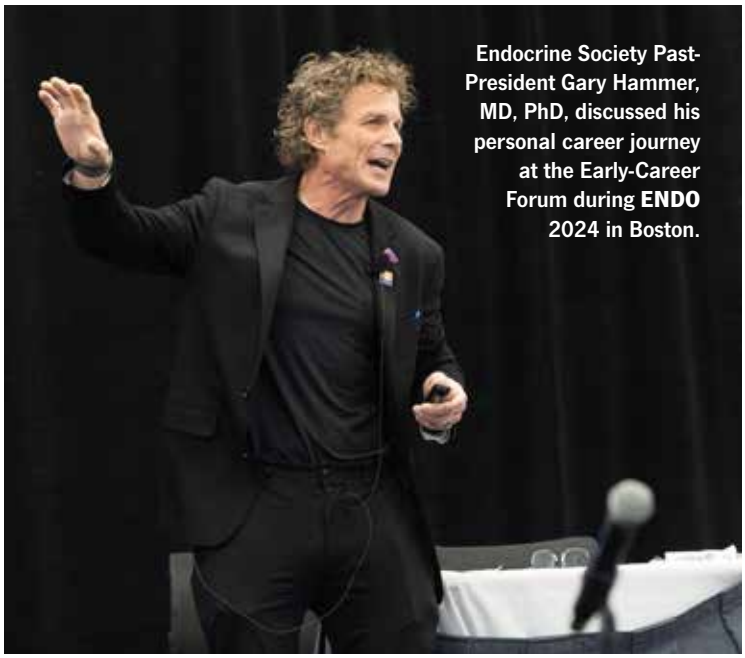
When Gary D. Hammer, MD, PhD, professor of internal medicine, cell and developmental biology, and molecular and integrative physiology at the University of Michigan in Ann Arbor, and past-president of the Endocrine Society, was interviewing for his job at the University of Michigan, he was taken to a famous restaurant in Ann Arbor to meet with the head of the cancer center, and the legendary Wolverines football coach Bo Schembechler. (Schembechler's wife passed away from adrenal cancer.)

Schembechler told Hammer he only had one question for him: "Did you or did you not negotiate football tickets?" The room of 500 people erupted in laughter, but Schembechler stood silent and crossed his arms.

"I stood up, looked him in the eye, and said, 'Bo, I think that's why I'm here with you tonight,'" Hammer says. "We were best friends until the day he died."

For patients with adrenal disease — congenital adrenal hyperplasia, Cushing syndrome , adrenakl insufficiency, primary aldosteronism, pheochromocytoma and adrenal cancer — endocrinologists and other adrenal experts have been joining forces — locally, nationally, and internationally — to collaborate and leverage expertise in both the clinical care of patients and research into disease mechanisms as they search for novel therapies for these rare diseases. There have been some incredible developments even in the past five years: new and still-experimental medications, gene therapies, new surgery techniques, and even coalitions of international researchers cooperating.

*Endocrine News* caught up with Hammer; Deborah Merke, MD, MS, senior investigator and chief of the Department of Pediatrics at the National Institutes of Health, in Bethesda, Md.; Nancy Dugal Perrier, MD, Walter and Ruth Sterling Endowed Professor of Surgery, Department of Surgical Oncology; chief, Section of Surgical Endocrinology; associate director, Multidisciplinary Endocrine Center, M.D. Anderson Cancer Center, Houston, Texas; Emilia Modolo Pinto, PhD, a researcher in the Department of Pathology at St. Jude Children's Research Hospital, in Memphis, Tenn.; and William Rainey, PhD, Jerome W. Conn Professor of Medicine in the Departments of Molecular & Integrative Physiology and Internal Medicine at the University of Michigan, in Ann Arbor, to discuss the recent breakthroughs, things still on the horizon, and the gaps that still need to addressed before reaching it.



Endocrine Society Past-President Gary Hammer, MD, PhD, discussed his personal career journey at the Early-Career Forum during **ENDO** 2024 in Boston.

### *Endocrine News:* How do you view the current state of adrenal research and clinical care? Are there any gaps that need to be addressed? Are there areas in adrenal that need more attention?

**Emilia Modolo Pinto:** Adrenal research has advanced significantly over the past two decades, particularly in uncovering the molecular mechanisms behind adrenal tumors and congenital adrenal disorders. Still, important gaps remain. Rare adrenal diseases are still underrepresented in large-scale studies, and clinical care often relies on limited evidence or extrapolation from other patient populations. One critical point is that pediatric and adult adrenocortical tumors are biologically distinct diseases, with different genetic

**Gary D. Hammer, MD, PhD**
University of Michigan, Ann Arbor

"We're beginning to really understand the nuts and bolts of organ homeostasis, which means we're starting to understand the rules of engagement of stem cells and progenitor cells and individual organs, how they are regulated, how they stay alive, self-renew, and differentiate continually."

**Deborah Merke, MD, MS**
National Institutes of Health, Bethesda, Md.

"Adrenal research and adrenal clinical care are rare, so a shared forum is essential to advance research and improve the care of our patients. The Endocrine Society has created a global community where adrenal researchers and clinicians can network, collaborate, and work together to advance science and improve the care of our patients."

**Nancy Dugal Perrier, MD**
M.D. Anderson Cancer Center, Houston, Texas

"I think the complexity of thinking through disease at presentation and then being able to really predict and prevent downstream disabilities from that, predicting who's at high risk for bilateral disease, that's asynchronous, who, at what age are they presenting with the aggressiveness of the disease and what we can expect."

**Getting the juices flowing: The adrenal gland was first described in the 1500s. In 1950, Kendall, Hench, and Reichstein won the Nobel Prize in Physiology or Medicine "for their discoveries relating to the hormones of the adrenal cortex, their structure and biological effects."**

drivers, developmental contexts, and clinical behaviors, yet they are often treated and studied under the same framework. Recognizing and operationalizing this distinction is crucial for both research and patient care. There's also a gap between genomic discoveries and their integration into everyday care, especially for risk assessment, surveillance, and counseling of individuals with predisposing variants. While preclinical models, such as patient-derived cell lines, organoids, and animal models, are increasingly available, current treatments are still only loosely connected to the underlying biology, which limits the translation of molecular insights into targeted therapies.

**Willliam Rainey:** This is an amazing time to be an adrenal researcher with recently developed technologies having a significant impact on our abilities to take a deeper dive into adrenal biology and disease. On the basic and translational science side, I would highlight four areas where the field is moving ahead but where additional work is needed. First, we need a stronger foundational understanding of adrenal stem cell biology and its role in normal adrenal homeostasis, so that our research can be translated into tissue engineering and adrenal cell–based therapies. Second, we need deeper insight into the genetic, epigenetic, and hormonal mechanisms that drive the sexual dimorphism observed in adrenal disorders such as primary aldosteronism, Cushing syndrome, and adrenocortical carcinoma. Third, we need to clarify the physiologic and pathologic regulators of adrenal androgen production. This area remains one of the least understood of human adrenal biology, in part because mice are unable to model human adrenal androgen synthesis. Finally, as in all areas of biomedical research, the adrenal field needs to adopt appropriate artificial intelligence tools in ways that can strengthen our basic research and accelerate translation.

**Emilia Modolo Pinto, PhD,**
St. Jude Children's Research Hospital, Memphis, Tenn.

> I'm deeply passionate about adrenal research, and because these diseases are extremely rare, every observation matters. Even small discoveries, whether molecular, clinical, or developmental, can help advance understanding, improve patient care, and ultimately change outcomes in this underexplored field.

**William Rainey, PhD,**
University of Michigan, Ann Arbor

> Like all endocrine areas, we need guiding principles on ways to embrace artificial intelligence as a tool to improve 'adrenal' patient care. This would include ways to improve primary care provider detection of adrenal disease (and endocrine disease in general). But also, as a rapid and easily available second opinion tool for overworked endocrinologists.

On the clinical side of adrenal research, two areas are likely to remain especially active in the coming years. First, we still lack therapies that reliably reproduce physiologic cortisol circadian rhythms in adrenal insufficiency as well as restoring these patterns after patients are treated for Cushing syndrome. The clinical benefits of re-establishing normal cortisol rhythmicity could have a significant impact on patient quality of life. Second, there is growing momentum to expand screening for adrenal steroid–excess disorders, particularly primary aldosteronism and Cushing syndrome. Hopefully these efforts will be accelerated by the increasing use of artificial intelligence in primary care, which could improve recognition of adrenal (and other endocrine) diseases and lead to earlier diagnostic evaluation.

**Deborah Merke:** Now is a very exciting time to be doing adrenal research as we are making major advances in the clinical care of adrenal disorders, especially congenital adrenal hyperplasia (CAH). I have spent my entire career studying CAH, the most common cause of adrenal insufficiency in children and a complex and challenging disorder to manage due to the many hormonal imbalances. We are now entering a new era with the availability of novel drugs to treat CAH. The treatment of CAH with glucocorticoids that began in the 1950s was lifesaving, and since that time we have used glucocorticoids to not only treat the adrenal insufficiency but also to suppress the adrenocorticotropic hormone (ACTH)-driven adrenal androgen production characteristic of CAH. Excess glucocorticoids have been needed to adequately suppress adrenal androgens.

Many years of studying the pathophysiology of CAH and the adverse outcomes due to both disease-related and treatment-related factors has finally resulted in the availability of new drugs. In the EU, a modified-release form of hydrocortisone that approximates physiological cortisol circadian secretion has improved outcomes and was approved in 2021. In the US, a CRF-1 antagonist is FDA approved for patients four years of age and older with classic CAH since December 2024. This drug is an adjunctive treatment to glucocorticoid replacement and for the first time allows clinicians to control adrenal androgens using a non-glucocorticoid medication and therefore reduce glucocorticoid dose.

Several gaps exist. Importantly, the use of alternative strategies is in its infancy, and there is a lack of worldwide access to newly developed drugs. An oral modified-release form of hydrocortisone that was designed to mimic physiological circadian cortisol secretion (marketed as Efmody) is available in the EU; while the CRF-1 antagonist (marketed as Crenessity) is available in the US. Long-term follow-up is lacking. Although we have learned that circadian physiological glucocorticoid dosing is ideal, much needs to be learned about

**Emilia Pinto, PhD (center), met up with friends from around the world while perusing the posters during ENDO 2024. On the left is Gabriela Guercio, MD, from Argentina and on the right is Berenice Medonca, PhD, who traveled to Boston from Brazil.**

how best to replace glucocorticoid to optimize quality of life and disease control.

**Nancy Dugal Perrier:** As a committed surgical endocrine oncology oncologist for 25 years now, it has been fascinating watching the progression over these past 25 years of what has happened with technology and new information. In particular, I think where we stand with the ability to do two things in the perioperative space: First is to be able to identify the mutation of adrenal tumors, particularly for pheochromocytomas and the surrounding paragangliomas. I think knowing the more than two dozen mutations that are affiliated and using that as a predictor of how to personalize treatment for that patient has just been explosive in the past decade. And now, we see it as being a part of all of our operative decision making, not only our postoperative, but also our preoperative decision making.

I think the complexity of thinking through disease at presentation and then being able to really predict and prevent downstream disabilities from that, predicting who's at high risk for bilateral disease, that's asynchronous, who, at what age are they presenting with the aggressiveness of the disease and what we can expect. I think we can anticipate that much better now, and our surgical deployments are certainly more specific. Things like intentional cortical-sparing adrenalectomy early on at the time of the first adrenalectomy is really critical for doing enough operating on that patient, but not too much, anticipating that they're going to need another operation. People are living longer, we're identifying things earlier, we have better management, and we're managing for a normal lifetime now. When we're managing VHL patients, when we're managing MEN 2 patients, they're not dying of disease in midlife anymore. They're living long lives. Having treatment that matches the longevity and ensuring that we are not treating everything the exact same as if we only had one way to treat it. It really is personalizing care.

**Gary D. Hammer:** If I think about the last few years, the global gains that I see are in large part "organizational" gains. I'm very proud of the development of the two large cooperative groups. ENS@T, the European Network for the Study of Adrenal Tumor has been around 20 years, while the A5 (the American Australian Asian Adrenal Alliance), which we spawned out of Michigan, is now an international organization with over 50 institutions. Together, we're over 100 institutions working together cooperatively on adrenal science and disease treatment. I'm really proud of these organizations because they are now both mature, respected, valued groups that work together on a variety of fronts. They're really points of leverage with both big pharma and the governmental agencies to prove that even in rare endocrine diseases, we have the power to engage in large research projects and international clinical trials.

In the last few years, various cooperative groups, sometimes with engagement of patients, have developed multiple guidelines for the treatment of adrenal disease. To name a few: The adrenal cancer guidelines sponsored by European Society of Endocrinology (ESE) and ENS@T with endorsement by A5, Adrenal Incidentaloma Guidelines by ENS@T and ESE, operative standards for adrenal disease by the American College of Surgeons, and adrenalectomy guidelines by the American Association of Endocrine Surgeons (with Endocrine Society members serving on the writing committee) and additional guidelines for congenital adrenal hyperplasia, glucocorticoid-induced adrenal insufficiency (ESE and the Endocrine Society) and various primary aldosteronism and pheochromocytoma guidelines.

The gaps are obvious. While there are technical and scientific challenges, industry and governmental agencies have slowly become more risk tolerant to funding such research and

translation into the clinical realm for rare (adrenal) diseases. While operational funding of cooperative groups like ENS@T and A5 have been a historic hurdle, as both groups have gained trust and proven value to investigators and clinicians alike, member dues and growing industry support are providing support for sustainable financial operations.

### *EN:* What are some exciting developments or breakthroughs in the adrenal arena?

**Pinto:** One of the most exciting advances is our growing understanding of the tumor immune microenvironment, including studies revealing how immune infiltration, antigen presentation, and immune evasion shape adrenal tumor behavior, opening new avenues for immunotherapy. Equally exciting is the recognition that developmental gene regulation plays a key role in adrenal tumorigenesis. Advances in long-read sequencing, single-cell approaches, spatial transcriptomics, and methylation profiling are revealing complex genomic architectures that were previously invisible. These approaches are redefining how we understand adrenal development, from embryogenesis to differentiation of fetal zones, and how disruptions in these programs predispose to tumor formation. By combining developmental biology with population genetics and clinical endocrinology, we're gaining insight into how founder variants, genetic modifiers, and ancestry influence disease risk. This allows for more precise screening strategies and frames adrenal disease not just as a rare clinical curiosity but as a public health consideration in specific populations. For example, studies of the TP53 p.R337H founder variant in Brazil illustrate how population-level genetics, interpreted in the context of developmental timing, can directly inform surveillance and risk assessment strategies.

**Rainey:** Basic research successes in demonstrating that most primary adrenal diseases of steroid excess are caused by acquisition of cortisol- or aldosterone-driving somatic gene mutations. Multiple studies are already published supporting this concept.

Basic and translational research is taking advantage of the rapidly evolving "omics" technologies to better understand adrenal gland and adrenal tumor biology. These molecular tools are defining adrenal cell subpopulations within adrenal tumors as well as within the normal adrenal cortex, changing the way we think about the classical three zones: glomerulosa, fasciculata, and reticularis. We adrenal researchers also like to include "steroidomics," which applies mass spectrometry to quantifying a growing number of steroid hormones and metabolites in serum and urinary with the long-term goal of providing improved diagnostic biomarkers for adrenal diseases. Multiple studies have already been published supporting this concept.

Translational research indicates that primary aldosteronism is common and is part of a continuum that initiates with subclinical disease and progresses with time to classic primary aldosteronism with hypertension. These studies are changing the approach to detection of patients with primary aldosteronism.

Clinical research advances that have the potential to simplify subcategorizing primary aldosteronism patients into surgically treated unilateral or mineralocorticoid receptor blocker bilateral disease using nuclear medicine and targeted adrenal tumor ligands. Research is ongoing with early trials being published.

Clinical research advances to treat disease of adrenal steroid steroid excess include recently recently developed aldosterone synthase inhibitors to treat primary aldosteronism as well as corticotropin releasing hormone and ACTH receptor blockers to treat Cushing disease and congenital adrenal hyperplasia. Again, research is ongoing with early trials being published.

**Merke:** The development of new drugs for use in the management of CAH is by far the most exciting development.

**Perrier:** As a dedicated surgical endocrine oncologist, I have witnessed the remarkable advancements in technology and the accumulation of new information over the same period. Notably, the identification of so many genetic mutations in adrenal tumors has revolutionized patient treatment and is personalizing treatment strategies. This newfound understanding has become an important component of our operative decision making.

The ability to identify those individuals with a high risk for bilateral disease and the disease's aggressiveness has made surgical options more personalized. For early detection of pheochromocytoma, cortical-sparing adrenalectomy at the initial adrenal surgery offers a better possibility of organ preservation and lessens the risk of subsequent unnecessary adrenal insufficiency.

Advancements in managing metastatic thyroid cancer in MEN 2 patients coupled with earlier disease identification has changed how we manage these longer lifespans. The same is true for von Hippel-Lindau syndrome. Treatment now aligns with their longevity, ensuring the right treatment at the right time for the right patient.

### *EN:* On that note, can you share what you consider to be defining moments in your career?

**Pinto:** An early defining moment in my career was identifying the TP53 p.R337H variant as a major risk factor for pediatric adrenocortical tumors and recognizing its founder effect in Brazil. That discovery reshaped our understanding of cancer risk in that population and showed that even low-penetrance variants can have a profound population-level impact. Another pivotal moment was realizing that genetic risk alone doesn't tell the whole story. Pediatric adrenal tumors can now be classified based on their genetic alterations, revealing distinct molecular subgroups with different developmental origins, clinical behaviors, and outcomes. Discovering modifier variants and, more recently, insights into developmental mechanisms such as genome-wide paternal uniparental disomy, highlighted that cancer susceptibility is dynamic, context-dependent, and tightly linked to early development. I'm deeply passionate about adrenal research, and because these diseases are extremely rare, every observation matters. Even small discoveries, whether molecular, clinical, or developmental, can help advance understanding, improve patient care, and ultimately change outcomes in this underexplored field.

**Rainey:** Like many of life's paths, serendipity played a huge part in me becoming an adrenal researcher. As a financially strapped undergraduate student, I became part of my university's work study program. I interviewed for several jobs from working in the library to washing dishes in laboratories. I finally settled in the lab of a new assistant professor who was just setting up his group. He spent unlimited time with me for my training as well as acting as a career mentor and life coach. But the real "hook" was his unrelenting excitement about his research and our experimental data (from both successful and failed experiments). And it just so happens that his research focus was adrenal cell biology. After getting a BS and MS under his tutelage, I continued with adrenal research for my PhD dissertation, post-doctoral training, and then as independent faculty researcher. It's now going on 50 years since I stumbled into adrenal research. At this stage of my career, I believe it is critical to provide similar mentorship and not forget to express my excitement about adrenal research so there will be a next generation that follows.

**Merke:** There are so many things over the years that I am proud of that helped define my career — including one-on-one patient interactions such as helping children and adults achieve better disease control and live full lives; helping patients successfully have children; diagnosing complex cases that were previously misdiagnosed; mentoring fellows and students; and defining aspects of CAH that no one else had previously identified — such adrenomedullary dysfunction (epinephrine deficiency) in patients with classic CAH and the importance and prevalence of CAH-X, a contiguous gene deletion syndrome where about 15% of patients with 21-hdyroxylase deficiency also have hypermobility-type Ehlers-Danlos syndrome.

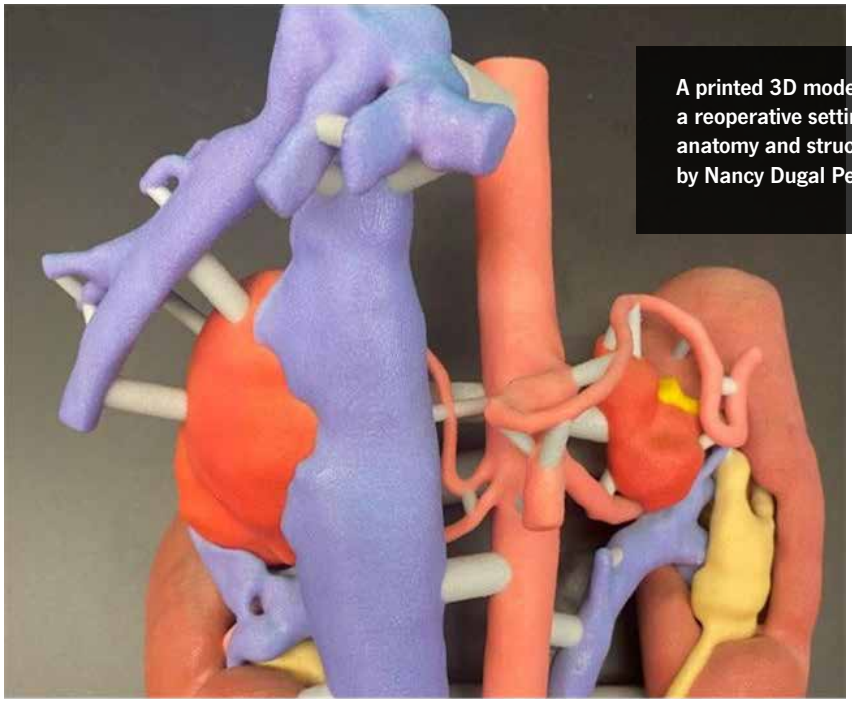
A memorable event in my career was recognition of my work by giving an invited Plenary session at **ENDO 2016**, "Lessons Learned in the Study of Congenital Adrenal Hyperplasia."

**Perrier:** There were two defining moments. My first interaction and engagement with a patient who had a cortisol-producing adrenal tumor. As a medical student on the endocrine service interpreting the laboratory values, it made sense to me. Then on the surgical service witnessing the introduction of laparoscopic adrenalectomy totally impacted me. Touching that beautiful gold-colored tumor, which ultimately cured her, propelled me on a course that ultimately defined my residency, fellowship, and career.

The second defining moment was witnessing Martin Walz's early demonstration of a posterior approach to an adrenalectomy via a retroperitoneoscopic approach. This forever changed my perspective of directed surgery and transformed 1,000s of future operations at MD Anderson and for our trainees.

### *EN:* We've talked before about the iterative process of discovery when it comes to the adrenal gland — how research informs care and vice versa. Can you tell us a little about what you're working on now?

**Pinto:** Right now, my work is focused on defining the key differences between pediatric and adult adrenocortical tumors. I'm particularly focused on building new experimental models, including models carrying the p.R337H variant, to study tumor initiation, progression, and potential vulnerabilities. These models help us understand why certain tumors appear early in life and how developmental context shapes cancer risk. Ultimately, our goal is to translate these insights into more biologically informed, effective interventions to improve outcomes for children affected by these rare tumors.



A printed 3D model of an adrenal tumor in a reoperative setting delineating surrounding anatomy and structures. Image provided by Nancy Dugal Perrier, MD.

**Rainey:** Our team investigates the mechanisms that regulate normal adrenal steroid hormone production and the processes that drive disorders of steroid excess, including adrenal androgen excess, primary aldosteronism, and Cushing syndrome.

Regarding normal adrenal steroid biosynthesis, we have had NIH funding for 25 years to better define the mechanisms underlying adrenocortical zonation, and specifically, the zonal differences in steroid hormone synthesis. This work continues in collaboration with Gary Hammer's lab, combining my group's expertise in cell and molecular biology with Hammer's transgenic mouse models of adrenal manipulation.

In the area of adrenal androgens, the University of Michigan research team has spearheaded research into human adrenal production of the 11-oxyandrogens. These hormones are now recognized as important contributors to normal sexual development at the time of adrenarche and play roles in conditions such as premature adrenarche, certain forms of polycystic ovary syndrome, congenital adrenal hyperplasia, and castration-resistant prostate cancer.

Finally, over the last decade, there has been a conceptual shift in how we understand the mechanisms leading to diseases of adrenal steroid excess. My team has been fortunate to participate in research that better defined the cellular origins and genetic causes of primary aldosteronism and adrenal Cushing syndrome (William Rainey and Juilee Rege Labs). Employing a next generational sequencing pipeline that utilizes formalin-fixed, paraffin-embedded archival adrenal tumor samples has enabled us to build strong multicenter collaborations with adrenal referral centers worldwide. As a result, we have defined the somatic mutation landscape of disease-causing adrenal lesions; determined the impact of age, sex, and race on the genetic causes of these diseases; and in the long run hope to apply these findings to improving personalized approaches to the diagnosis and treatment of adrenal disease.

**Merke:** So many of the research questions I have asked over the years were due to impactful patient encounters. I have a vivid memory of the mom of a patient of mine showing me the "sludge" she noticed in the bottle of hydrocortisone suspension she had just picked up from the pharmacy. This led to a clinical study and the suspension being recalled by the FDA. My encounter with a 3-year-old child with classic salt-wasting CAH who had loose joints and spongy skin on physical exam was the beginning of my studies of the contiguous gene deletion syndrome, CAH-X.

We need to listen better to patients and do a better job at incorporating the patient voice in our management of patients. In 2024, we created CAHQL, the first validated CAH-specific patient-reported outcome instrument to capture health-related quality of life. We are now using this tool to evaluate our management of CAH. Our research builds on and contributes to the unique aspects of the NIH. We continue to develop new approaches to diagnosis, management, and treatment using our large natural history cohort of over 450 patients with CAH at the NIH Clinical Center. Studies that focus on new treatments, disease management, novel biomarkers, improved genetic methodology, and evaluating the long-term health of affected individuals continues.

**William Rainey, PhD, (right) and Felix Beuschlein, MD, show off their Endocrine Society adrenal socks.**

**Perrier:** It is crucial to comprehensively evaluate and inform the adrenal patient. Genetic counseling educate the patients but also enable us to develop forward-thinking treatment plans — paramount to our patient-centered approach.

We are advancing metabolomic and proteomic markers for other neuroendocrine diseases and expanding to adrenal tumors. We foresee an ability to predict disease aggressiveness and to collaboratively identify potential targets for receptor-based therapies. Our clinical group is also a strong one that is working toward understanding adjuvant and neoadjuvant adrenocortical carcinoma (ACC) and of course targeted pathways such as HIF-2a for metastatic pheochromocytoma with or without conjunction of surgery.

**Hammer:** Leadership is a verb, not a noun. Leadership embodies a team — in action. As Bo Schembechler said, "It's all about … the team, the team, the team."

Building on the legacy of Jerome Conn (primary aldosteronism), Norm Thompson (one of the fathers of Endocrine Surgery who created the first Endocrine Surgery Training Program) and William Beierwaltes, (MIBG and NP59), our adrenal team at the University of Michigan currently includes Rich Auchus, Adina Turcu, Bill Rainey, Tom Giordano, Tobias Else, Frank Worden, and Katherine Wolf, together with leaders in Endocrine Surgery, Adrenal Radiology, and Adrenal Nuclear Medicine. We've been working together now for more than two decades, with a multidisciplinary team that integrates both basic science and clinical care.

I'm proud that all of these different people who we've been able to pull together, trust each other, and work together with a passionate focus on curing disease. I'm proud of the fact that we've been able to initiate and grow the International Adrenal Cancer Symposium, coordinate the International Adrenal Meetings, build A5, and become deeply embedded within the fabric of the Endocrine Society.

When discussing the outstanding graduate students and post-doctoral fellows in my own laboratory group, I am most proud of their work unraveling some of the rules of engagement of what we call the Sonic Hedgehog-expressing adrenocortical progenitor cell and the Sonic-Wnt relay of the cortical-apsular unit that is essential for normal homeostasis in health and goes awry in various diseases. Half of my lab studies this biology and as I discussed, we hope to use cell- and gene-based therapies to correct various diseases of adrenal failure.

In the adrenal cancer space, others in our broader University of Michigan adrenal team have linked adrenal cancer to a number of familial cancer syndromes with Li-Fraumeni syndrome and Lynch syndrome being the most common, but most recently, Birt-Hogg-Dubé syndrome, in which 3% to 4% of patients with adrenal cancer have a mutation in the folliculin gene. I think some of the most exciting work emerging from the lab is our burgeoning understanding of how metabolic programming coordinates different epigenetic profiles in three varieties of adrenal cancer As we learn how cancer usurps normal well-oiled programs that control normal homeostasis — we hope to exploit these cellular and molecular vulnerabilities to develop new therapies.

### *EN:* In your opinion, what role has the Endocrine Society had in advancing adrenal research and care?

**Pinto:** The Endocrine Society has been invaluable for adrenal research and care. It brings together basic scientists, clinician-scientists, and practicing endocrinologists, creating a space where rare adrenal diseases get the attention they deserve and where young investigators can connect with leaders in the field. Through education, guidelines, and a global

perspective, the Society helps ensure that discoveries reach patients. In such a rare and complex area, this support, and mentorship across generations, is priceless. Attending these meetings, you see role models in action and the inspiration they provide to young scientists. It's a reminder of why nurturing the next generation of adrenal researchers and clinicians is so important.

**Rainey:** There are currently no adrenal researchers on the NIH standing study sections that review adrenal grant applications. The Society should continue to push members to participate, where possible, as standing members, on NIH study sections. Without such expertise, the US adrenal research field will certainly decline in funding and, therefore, its ability to lead in this field.

I hope that the Society can continue to support and promote new/young adrenal research investigators. I believe that the mysteries of adrenal biology and disease remain critical areas of endocrine research, and the field needs a next generation of dedicated adrenal researchers.

The Endocrine Society and its adrenal experts should continue to call out the social media–driven headlines that adrenal excess or deficiency is extremely common and that non-tested supplements should be used as a non-prescription therapy for non-existent adrenal diseases. I realize this is not easy, and some would say correcting these misconceptions actually provides them with a new audience, but these non-scientific ideas are starting to have audiences at high levels within the public and governmental domain.

**Merke:** The Endocrine Society is the professional home to endocrinologists worldwide and brings together clinicians and researchers in many areas of endocrinology such as adult endocrinology, pediatric endocrinology, and reproductive endocrinology. Adrenal research and adrenal clinical care are rare, so a shared forum is essential to advance research and improve the care of our patients. The Endocrine Society has created a global community where adrenal researchers and clinicians can network, collaborate, and work together to advance science and improve the care of our patients.

**Perrier:** The Endocrine Society serves as the primary resource for scientific knowledge on endocrine tumors. It provides a platform for multiple disciplines like endocrinology and surgical oncology to come together to share, learn, and identify critical areas of focus, and it bridges the gap between scientific research and practical applications. In the era of instantly accessible information via PubMed, the Endocrine Society continues to foster a relational sense of community among its members. It is a society making these events worthwhile for its members because it is interactive and supportive.

**Hammer:** We would benefit from more engagement in the Society at the level of both industry and individuals (patients and advocates) to push the adrenal needle forward. I'm on the [Endocrine Society's] Board ofTrustees of the newly minted Hormone Foundation. Our aim is to raise funds to support the Society's missions to optimize care, advance science, educate, and advocate. We aim to engage individuals and groups that have capacity to support these noble goals.

While the Endocrine Society has limited resources, support should not only be defined by money. For example, Mila [Becker, the Society's Chief Policy Officer] and her team do an amazing job at advocacy for endocrine patients and for Endocrine Society member research and care delivery. But, since I'm on the adrenal soapbox today — I would be delighted to see the Endocrine Society increasingly be an enabler that can leverage and facilitate the interactions of empowered cooperative groups like A5 with governmental agencies, industry, and patient groups to help our unified voice be heard and push the adrenal agenda forward.

If the collective "we" continues to ground our questions in the best science and our goals in the best patient care, the Endocrine Society will continue to be the global leader in endocrinology. EN

– BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. IN MARCH, HE WROTE ABOUT THE LINK BETWEEN OBESITY AND DEMENTIA.

BY GLENDA FAUNTLEROY SHAW

Almost three years ago, Kotaro Sasaki, MD, PhD, was lauded as one of the Endocrine Society's Early Investigator Award winners. Now, he discusses his research that involves building a human adrenal gland from stem cells, the importance for scientists to attend **ENDO**, and why the process of publishing research can often prove challenging.

# adrenal *investigator*

**Kotaro Sasaki, MD, PhD, details how his laboratory's research is "poised to transform the field."**

What if adrenal disease could be treated not with lifelong pills, but with lab-grown human tissue designed to restore what the body has lost? That question lies at the heart of the work of Kotaro Sasaki, MD, PhD.

Sasaki is Richard King Mellon associate professor of Biomedical Sciences at the University of Pennsylvania's School of Veterinary Medicine and of laboratory medicine at the Perelman School of Medicine in Philadelphia. Before joining the faculty in 2018, he earned his medical degree from Hokkaido University School of Medicine (Sapporo, Japan) and his PhD from Kyoto University Graduate School of Medicine (Kyoto, Japan). Sasaki also completed his pathology residency and fellowship training at the University of Pittsburgh in Pennsylvania, and the University of Washington in Seattle.

In 2023, Sasaki was recognized by the Endocrine Society as one of five endocrinologists to receive the Early Investigator Award. At the time, although he was fairly new to the field of adrenal gland research, his contributions were significant. Sasaki's research discoveries are helping lay the foundation for understanding the molecular basis of human reproduction and endocrinology.

The Sasaki Lab has built first-in-class human pluripotent stem-cell derived adrenocortical organoids that are capable of producing cortisol and androgens in Adrenocorticotropic hormone (ACTH)-responsive manner both in vitro and in vivo. This platform recapitulates key features of prenatal human adrenocortical development, providing a foundation for mechanistic studies and translational applications. "Our technology is poised to transform the field," he tells *Endocrine News*.

We spoke with Sasaki about his groundbreaking discoveries and how he manages the multitude of challenges he faces daily in the Sasaki Lab.

Kotaro Sasaki, MD, PhD

Sasaki (left) with Rocio Pereira, MD (center), and Pablo Knoblovits, MD, during **ENDO 2023** in Chicago, Ill.

***Endocrine News:* How do you see your research eventually improving the lives of people with adrenal diseases?**

**Kotaro Sasaki:** Our goal is to build a human adrenal gland "in a dish" from stem cells. One long-term application is cell therapy for people with primary adrenal insufficiency, such as Addison's disease, in which the adrenal gland can no longer produce essential steroid hormones. Today, patients must rely on lifelong steroid replacement, and there is no curative treatment for patients with primary adrenal insufficiency. Our vision is to recreate adrenal tissue as organoids from stem cells and ultimately transplant those cells back into patients to restore adrenal function.

The adrenal gland is an essential organ for our life, and there's millions of patients who are suffering from primary adrenal insufficiency worldwide. The adrenal gland is a critical endocrine organ for our stress response, right? So, when our body faces stress, such as infection, injury, or emotional stress, the pituitary gland transmits a signal to the adrenal gland to produce an essential stress hormone, called cortisol. That, in turn, increases the blood pressure, increases the blood glucose levels, thus enabling the body to cope with these challenges. Without adequate adrenal function, we cannot survive.

So, we started this project about five years ago, and back then, there were few, if any, high-quality studies showing how to generate the adrenal gland in a dish from stem cells in a robust and physiologically meaningful way. Our approach has been to first understand how nature builds the adrenal gland during development, and then carefully recapitulate that process in a dish, step by step, using stem cells.

**Sasaki (center) with then Endocrine Society President Ursula B. Kaiser, MD, and Trevor Archer, PhD, who was the chair of the Laureate Awards Committee during the Excellence in Endocrinology event during ENDO 2023 in Chicago, Ill.**

***EN:* You were honored with one of the Early Investigator Awards in 2023 and, at the time, had only been a member of the Endocrine Society for two years. How has your involvement with the Society changed since then?**

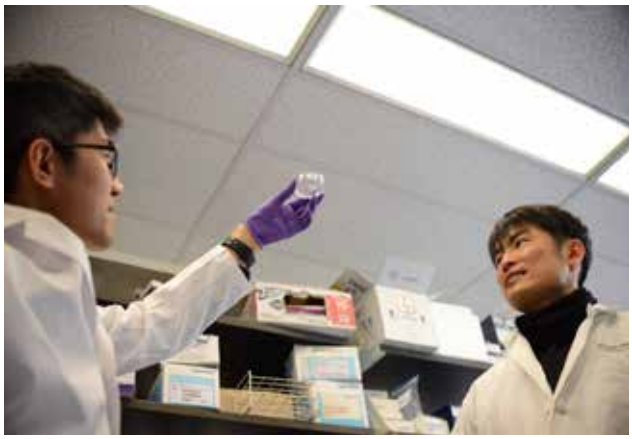
**Sasaki:** I attend **ENDO** almost every year, and it has become an invaluable community for me. It's the best opportunity for me to interact with other scientists working on the adrenal gland and related endocrine biology. Because I am relatively new to the adrenal field, building these connections has been especially important, learning how others approach science and tackle challenges such as tissue regeneration. **ENDO** provides a unique forum for those exchanges, and my involvement with the Society has continued to grow through those interactions.

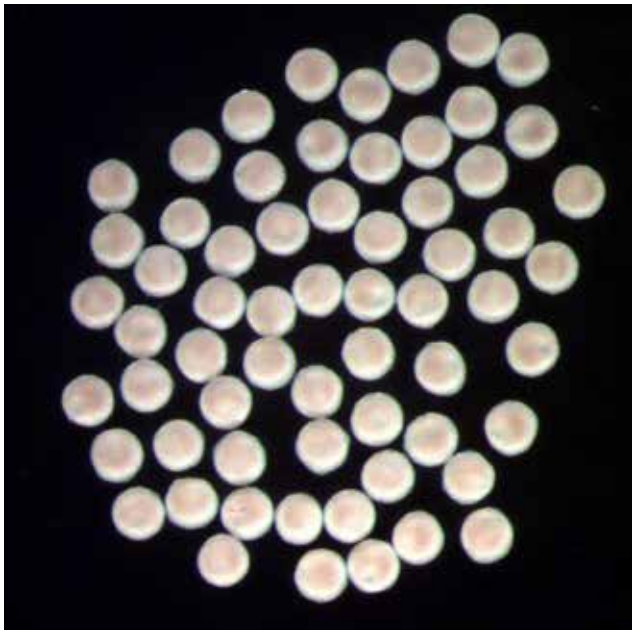
***EN:* What's the biggest challenge facing the Sasaki Lab at this time? Is it the research, managing a lab team, or, perhaps, financial resources?**

**Sasaki:** Honestly, all of them are challenges. Managing people, doing the science, and securing funding all require constant attention. Another major challenge I often encounter is the publication process. When we submit a paper, we often receive extensive and thoughtful critiques from reviewers, some of which can be tangential and not directly related to the scope of the study, and addressing all of them takes a significant amount of time. These days, it is not uncommon for the process from initial submission to publication to take a year or more. Now, I am fortunate to have the stability to work through long revision cycles, but for my postdoc and students, time is a real constraint as they need to move forward with their careers. Sometimes, trainees are unable to see a project through to publication before transitioning to their next position, which is a shame. Ideally, I want everyone in the lab to complete a project from

Right: Adrenal organoids containing adrenal primordium-like cells cultured 18 days in a dish.

Below: Kotaro Sasaki (right) and Michinori Mayama, MD, PhD. (left), a research associate in the Sasaki Lab, holding a dish containing adrenal organoids.





start to finish, including publication, but the length of the current review process makes that increasingly difficult.

There's a paper I'm currently working on that we started in 2021, so it's already taken about four years. During that time, we have focused on building and refining a new platform, continuously improving it until it reached a truly solid state. We are now close to resubmission, and I expect it to be published. It will be a substantial paper that represents the culmination of five years of our intense, sustained effort, and I believe it will have a major impact on the field.

### *EN:* Juggling all of those challenges can be all-consuming. What's your favorite way to unplug when you leave the bench?

**Sasaki:** Outside of the lab I like reading books, working out in the gym, and traveling. One of the nice aspects of research is that travel often overlaps with conferences, where you can meet new people and exchange ideas, so that has become one of my favorite activities outside day-to-day lab work. Research is very competitive, so working hard is extremely important, but at the same time, you need some time to just relax. I often tell my lab members that finding the right balance matters, as does having people around you who support and understand your science, such as family, spouse, or friends. Having those who appreciate the nature of this work is especially important because research can be difficult for outsiders to fully grasp. It is extremely time consuming and labor intensive, and there are days when we spend the entire day in the lab to move a project forward. EN

> "[**ENDO**] is the best opportunity for me to interact with other scientists working on the adrenal gland and related endocrine biology. Because I am relatively new to the adrenal field, building these connections has been especially important, learning how others approach science and tackle challenges such as tissue regeneration. **ENDO provides a unique forum for those exchanges, and my involvement with the Society has continued to grow through those interactions."**
>
> – KOTARO SASAKI, MD, PHD, RICHARD KING MELLON ASSOCIATE PROFESSOR, BIOMEDICAL SCIENCES, UNIVERSITY OF PENNSYLVANIA'S SCHOOL OF VETERINARY MEDICINE; ASSOCIATE PROFESSOR, LABORATORY MEDICINE, PERELMAN SCHOOL OF MEDICINE, PHILADELPHIA, PENN

– SHAW IS A FREELANCE WRITER BASED IN CARMEL, IND. SHE IS A REGULAR CONTRIBUTOR TO *ENDOCRINE NEWS* AND WRITES THE MONTHLY LABORATORY NOTES COLUMN.

# Delays in Grant Funding Persist – Share Your Story With Us

Multiple news outlets are reporting that, despite the influx of funding provided by Congress in the recently passed funding bill, there remain significant obstacles preventing those funds from being used to support research grants.

Scientists are expressing concern about the slow pace to the release of Notices of Funding Opportunities (NOFOs) and the substantial number of "forecasted" opportunities that many expected to be formally published months ago. Congress needs to understand what these delays and disruptions mean to the lifesaving work that endocrine scientists do. If you are concerned about a specific NOFO or grant opportunity or have otherwise had difficulty in applying for or receiving information about grants please let us know via e-mail to: **advocacy@endocrine.org**.

**Endocrine Society Board member Angela Leung, MD, (top, left) and member Estelle Everett, MD, MHS, (bottom, left) participated in our virtual Hill Day with Endocrine Society Research Affairs Manager Sophia Kaska, PhD, (top, right), and met with Brian McNeil, MD, (bottom, right) a urologist who is a policy fellow in Senator Adam Schiff's (D-CA) office to discuss NIH funding. We are grateful to the 40 Endocrine Society members who participated in visits like this one to share the value of endocrine research!**

## Take Action

### Urge Congress to Fund NIH for FY 2027; Join Our New Online Advocacy Campaign

Congress is currently considering funding for fiscal year (FY) 2027, which begins October 1, 2026. The Endocrine Society wants Congress to make the NIH a priority. We are calling on our US-based members to urge their elected officials to increase funding for the NIH and ensure that the agency is protected from harmful policy proposals and disruptions to grants.

Because many congressional offices do not understand how disruptions to grant review and distributions affect their states, it is critical that all senators and representatives hear from their constituents about the importance of funding the NIH.

We need your help to share our message to increase funding for the NIH in FY 2027 and protect NIH research. Please take action now by joining our online advocacy campaign at: **endocrine.org/advocacy/take-action** and forward the campaign to your colleagues. Your advocacy can help make a difference.


# SAVE THE DATE

## CLINICAL ENDOCRINOLOGY UPDATE

**OCTOBER 22–24** ONLINE CLINICAL MEETING

**PRACTICAL ENDOCRINOLOGY EDUCATION YOU CAN APPLY DIRECTLY TO PATIENT CARE**

**ENDOCRINE.ORG/CEU2026**



ENDOCRINE SOCIETY

# Endocrine Society Calls on Congress to Increase NIH Funding and Protect Research

Because Congress is considering funding for fiscal year 2027 right now, the Endocrine Society organized a virtual Hill Day on March 13, to call on lawmakers to increase National Institutes of Health (NIH) funding and protect NIH research. We also urged representatives and senators to provide funding for women's health research and establish a dedicated Women's Health Research Fund within the Office of the Director. In addition, we informed congressional offices about continued delays in funding opportunities and obstacles for researchers to draw down on approved funds. Hopefully, this will prepare them to address these issues with the administration.

More than 40 members of the Society from states and congressional districts of lawmakers who serve on the appropriations committee participated, resulting in 100 congressional meetings. Our virtual meetings amplified the voice of endocrine research and the Society's influence. You can help maximize our impact! Please join our online advocacy campaign by visiting **endocrine.org/advocacy/take-action**, and share our message with your representative and senators.

We will continue to keep members posted about funding developments, and we will participate in an in-person Hill Day later this fall as well.

# CMS Releases Additional Information on Pilot Program to Expand Access to Obesity Medications

Last month, the Centers for Medicare and Medicaid Services (CMS) provided additional information on its proposed model to expand access to anti-obesity medications for Medicare and Medicaid beneficiaries. The Better Approaches to Lifestyle and Nutrition for Comprehensive hEalth (BALANCE) Model aims to increase access to GLP-1 medications and healthy lifestyle interventions to improve health.

The latest information includes a list of the medications that will be included in the model, and the clinical criteria beneficiaries must meet to be eligible for coverage. The model, which is expected to launch in 2027, will provide certain Medicare beneficiaries with GLP-1 medications at $50 per month. More information about the model can be found at: **cms.gov/priorities/innovation/innovation-models/balance**.

The Society is pleased to see CMS taking steps to expand access to these medications for beneficiaries. We have supported previous efforts by the agency to expand access to obesity medications. We also support the Treat and Reduce Obesity Act (TROA), which would allow Medicare to cover obesity medications for weight loss. We will continue to analyze this proposal and the clinical criteria for beneficiaries to better understand how this program would work and who would benefit. We will also continue to educate members of Congress and congressional staff about obesity.

In January, we hosted a congressional briefing on Capitol Hill to discuss obesity and its impact on liver disease and shared Society educational resources related to obesity. We will also soon be releasing an updated version of our *Obesity Playbook*, which contains educational information for congressional staff who work on obesity issues and policy. EN

Mount Sinai

## Chief of Endocrinology
## Mount Sinai Hospital
Manhattan, NY

Mount Sinai Hospital is seeking a Chief of Endocrinology to add to its growing Division of Endocrinology!

The Icahn School of Medicine at Mount Sinai seeks to recruit an outstanding Physician-Scientist to serve as its next Chief of the Division of Endocrinology, Diabetes and Bone Disease in the Department of Medicine.

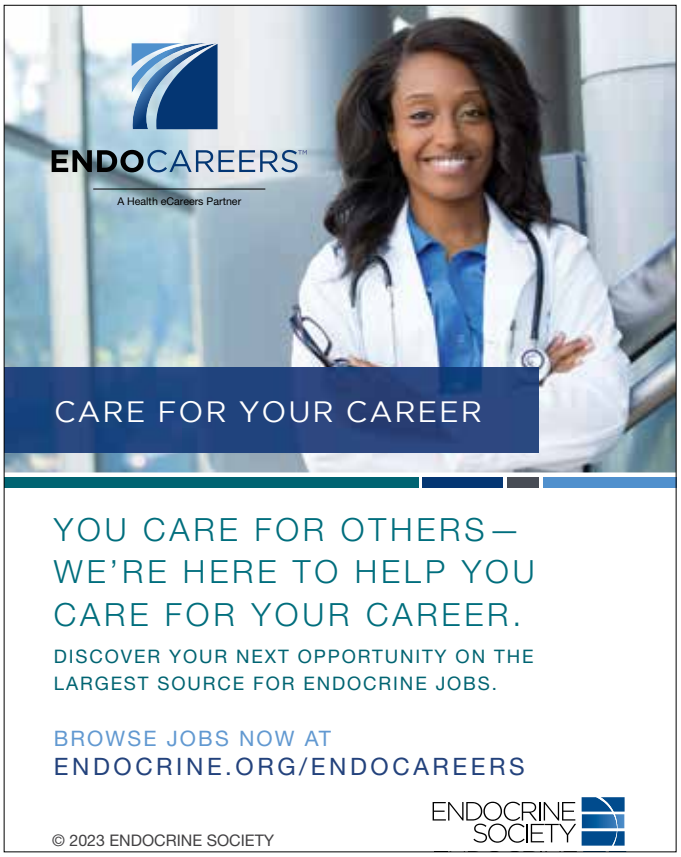
This position is responsible for the overall management of the division along with clinical and educational responsibilities. Candidates must have an MD or DO and have, or be eligible for, a New York medical license and must be BC/BE in Endocrinology, Diabetes and Metabolism with preference given to those with advanced degrees.

For the full job description, or to apply, please scan the QR code:
**https://careers.mountsinai.org/jobs/3036003?lang=en-us**

**Compensation range from 375K to 500K**
(not including bonuses / incentive compensation or benefits)

Please specify Job Title of interest and send CV with Cover Letter to:

**Physician Recruitment Department**
*Mount Sinai Health System*
*Physician.recruitment@mountsinai.org*

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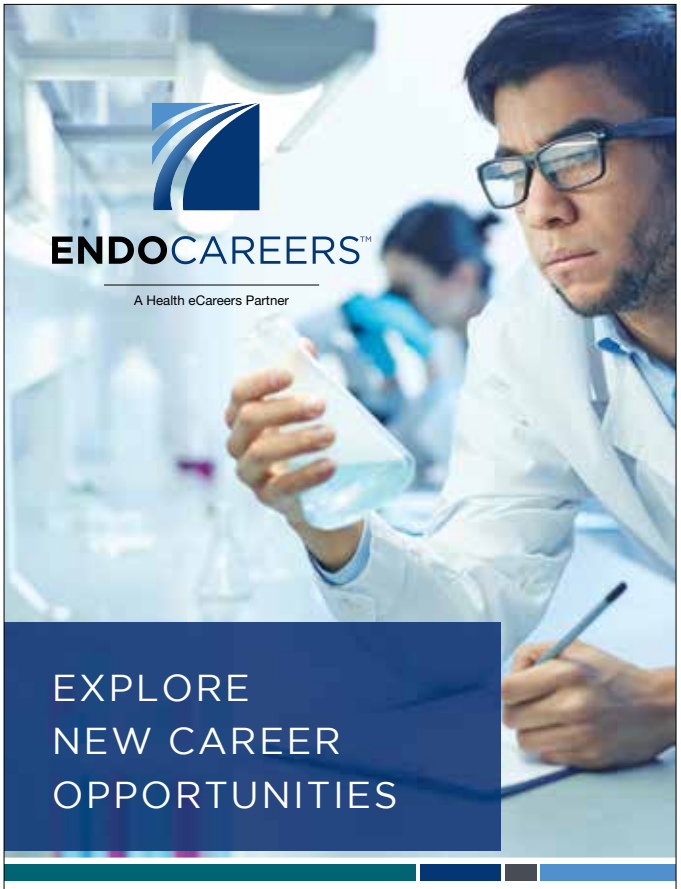


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