

NOVEMBER 2020

THE LEADING MAGAZINE FOR ENDOCRINOLOGISTS

# Endocrine news

INTERNATIONAL

## Aiding

## & ABETTING: How COVID-19 Boosted Diabetes Care Innovations

UNDERLYING CONDITION: DIABETES

CORONAVIRUS: COVID-19

- The Endocrine Society has advocated for adopting innovative models of diabetes care since 2018, but these efforts have been hampered by a variety of factors.
- As the COVID-19 pandemic started, many of these innovations were put into practice such as telemedicine and team-based care.
- Once the pandemic has passed, those who treat people with diabetes need to maintain the progress made during the pandemic.

### SMOG WARNING:

Air pollution and its link to diabetes

### HIGHS & LOWS:

Virtually monitoring glucose in hospital settings

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The Endocrine Society has been leading the charge for adopting innovative diabetes treatment models since 2018. However, the specter of the COVID-19 pandemic has forced the entire healthcare industry to rethink how patients are treated, resulting in an unprecedented wave of innovation that could revolutionize how care is delivered.

BY DEREK BAGLEY

## 30 | The Insulin Evolution

More than simply a history lesson, a new paper in *Endocrine Reviews* looks at insulin's advances since its discovery a century ago. A team led by Irl B. Hirsch, MD, has created an overview of informed treatment options as well as a comprehensive guide that will prove to be an invaluable resource for at least another hundred years.

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## The Impact of COVID-19 on People with Diabetes

**N**ovember is Diabetes Awareness Month, an important opportunity to raise awareness about the challenges facing the over 30 million Americans living with diabetes. This year's public awareness campaign of diabetes is even more important given the COVID-19 pandemic. People with diabetes are at increased risk of developing more serious complications from COVID-19. People with type 1 diabetes are 3.5 times more likely to die in the hospital due to COVID-19 than those without diabetes. The current crisis has made life even more challenging for people with diabetes, which is why the work that we are doing to advocate for people with diabetes is so important. With your participation, we have been working to advance our advocacy efforts on the policy issues impacting the millions of Americans living with diabetes.

Here are some of the areas where we have raised awareness in recent months:

### Special Diabetes Program and Diabetes Research

The Special Diabetes Program (SDP) is a critically important program that funds type 1 diabetes research and prevention programs for American Indians and Alaskan Natives (AI/AN). Funding for SDP has been used to advance new technology to

manage diabetes like the artificial pancreas. The SDP has also helped to reduce the complications of type 2 diabetes in AI/AN populations. However, SDP will expire on December 11 unless Congress takes action to pass an extension of the program.

The Endocrine Society has been a lead advocate for a five-year reauthorization of the SDP. In October, we conducted a Virtual Hill Day with congressional offices to advocate for the program. We also hosted a congressional briefing in October to educate congressional staff on the importance of SDP. The briefing featured Endocrine Society member Al Powers, MD, and Griff Rodgers, MD, the Director of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) at the National Institutes of Health (NIH), and Chief Beverly Cook, a member of the National Indian Health Board and a nurse. We have also launched an advocacy campaign for Endocrine Society members. You can help us advocate for SDP by visiting: [www.endocrine.org/advocacy](http://www.endocrine.org/advocacy).

In addition, we are a trusted advisor to policy makers concerning diabetes research and a vocal advocate calling for funding for diabetes research. We have led efforts to increase federal support for the NIDDK, including delivering appropriations testimony, sponsoring congressional briefings, and participating in the Rally for Medical Research.

### Insulin Affordability

Last year, it seemed likely that Congress would pass legislation to address the rising cost of prescription drugs. Unfortunately, the COVID-19 pandemic forced Congress to shift its focus. In the absence of legislation, the Trump administration has attempted to address rising costs through several executive orders. The orders issued by the administration are designed to lower the cost of prescription drugs. However, it is unlikely that any of them will be implemented in the near future because they do not carry the force of law and will likely be challenged in court.

### Cast Your Ballot

The election for our president-elect candidates has launched. We have two outstanding candidates on the ballot, and I encourage all our voting members to participate in this very important activity. To facilitate the voting process, a link to the electronic ballot is now available on the Society's website. Please remember to cast your vote and remind your colleagues as well. This is *your* Society, and your participation in the election is important!



The Endocrine Society continues to advocate for lowering the cost of insulin and other prescription drugs. The Society has called on Congress to eliminate patient co-pays for insulin during the COVID-19 public health emergency. We have also updated our Insulin Affordability Position Statement to highlight additional tactics that can be employed to lower insulin costs and highlight our work on this important issue.

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Throughout the pandemic,  
we have successfully advocated  
for measures from expanding  
telehealth coverage to providing  
access to personal protective  
equipment to increasing  
funding for research.

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The statement includes positions and recommendations for policy makers to lower the cost of this lifesaving drug. You can view the position statement by visiting: [endocrine.org/insulin](https://endocrine.org/insulin).

## Diabetes Prevention and Education

We have worked to expand programs that promote diabetes prevention and education. The National Diabetes Prevention Program is an important program that uses proven interventions to delay the onset of type 2 diabetes. This program is also available to Medicare enrollees through the Medicare Diabetes Prevention Program (MDPP). Unfortunately, virtual providers

# 2022 LAUREATE AWARDS

CALL FOR NOMINATIONS

DEADLINE: DECEMBER 31, 2020

## NOMINATE TODAY!

Our Laureate Awards are the highest honors bestowed in recognition of the paramount achievements in the endocrinology field including, but not limited to, seminal research, clinical investigation, translational research, mentorship, and non-traditional activities to support developing countries.

Nominate on your own schedule—nominations for the 2022 awards cycle are now being accepted until December 31, 2020.

Get started now by visiting [endocrine.org/laureate](https://endocrine.org/laureate).

Questions? Contact us at [laureate@endocrine.org](mailto:laureate@endocrine.org).

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of these prevention services can not participate in the MDPP, which limits access for those wanting to participate in the program virtually. The Endocrine Society has worked to

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**The current crisis has made life even more challenging for people with diabetes, which is why the work that we are doing to advocate for people with diabetes is so important. With your participation, we have been working to advance our advocacy efforts on the policy issues impacting the millions of Americans living with diabetes.**

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expand the MDPP to virtual providers. We recently endorsed legislation introduced in the Senate that would require the Centers for Medicare and Medicaid Services (CMS) to allow virtual providers to participate.

We continue to advocate for expanded access to Diabetes Self-Management Training (DSMT). DSMT is an important program that provides training and education for people with diabetes to help them self-manage their care. DSMT is a covered benefit under Medicare, but it has been underutilized in recent years. Medicare enrollees have also faced challenges accessing the program virtually during the pandemic.

Earlier this year, the Society sent a letter to CMS asking them to give Medicare beneficiaries the ability to receive DSMT services from home via telehealth. As a result of our efforts, CMS has worked to ensure that all recognized and accredited DSMT programs can provide this service via telehealth during the COVID-19 public health emergency. The Society also continues to advocate for legislation introduced in the House and Senate that would reduce the barriers to accessing DSMT. You can learn more about these efforts by visiting: [www.endocrine.org/advocacy](http://www.endocrine.org/advocacy).

## Diabetes and COVID-19

Finally, as policy makers consider various ways to address COVID-19 and provide relief, we consistently call their attention to the impact of COVID-19 on people with diabetes, physicians treating diabetes, and researchers studying diabetes. Throughout the pandemic, we have successfully advocated for measures from expanding telehealth coverage to providing access to personal protective equipment to increasing funding for research. For more details, visit: [www.endocrine.org/covid19](http://www.endocrine.org/covid19).

Thanks to all of you who have helped advance these efforts during these unprecedented times. Your voice is a critical component in the work we do to advocate for these issues. For those of you not involved, we encourage you to join us in advancing these important priorities. To learn more about how you can participate in our diabetes advocacy, please contact us at: [advocacy@endocrine.org](mailto:advocacy@endocrine.org).

If you have any questions or comments, you can reach me at: [president@endocrine.org](mailto:president@endocrine.org). 

**Gary D. Hammer, MD, PhD**  
President, Endocrine Society

# NEW FRONTIERS IN BASIC SCIENCE:

APPLYING NEW TECHNOLOGY TO ENDOCRINE RESEARCH



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FROM THE **EDITOR**

## COVID-19 Leads to Diabetes Care Innovations

**I**n recognition of National Diabetes Month, this month's cover story looks at the biggest health crisis of our collective lifetimes: the COVID-19 pandemic. More specifically, how this public health emergency has affected treating patients with diabetes. For "Unprecedented: How COVID-19 Jumpstarted Diabetes Care Innovation," on page 22, senior editor Derek Bagley was able to use data just published last month in *The Journal of Clinical Endocrinology & Metabolism*. This paper, entitled "Innovations in Diabetes Care for a Better 'New Normal' After COVID-19," is based on the work of the Endocrine Society's own Innovative Models of Diabetes Care Task Force, which was formed in 2018.

Since that time, the Endocrine Society has long advocated for the adoption of more innovative models of diabetes care, but for one reason or another, progress has been hampered. Then along comes a pandemic, which, against the odds, has seemingly jumpstarted the implementation of new care delivery models at an unprecedented pace. Since the outcomes of people with diabetes had not improved over the past decade, it was imperative to change the way care is provided, according to Robert A. Gabbay, MD, chief scientific and medical officer, American Diabetes Association, Arlington, Va. "Given the dual pandemics of COVID-19 and diabetes, adoption of these innovations has accelerated in the hopes of creating a 'new normal' and improvements in the care we provide for people with diabetes," he says.

In this new normal that we've adjusted to, it's common practice to wear a mask to avoid spreading or contracting COVID-19. But should masks be recommended to help people avoid diabetes? That's the intriguing question posed by Eric Seaborg in his article "Airborne Toxic Events: Air Pollution's Role in Diabetes" on page 34 that looks at the link between air pollution and diabetes. More specifically, research is showing that the microscopic, endocrine-disrupting-containing particles in air pollution can be ingested and not only affect the lungs but vital organs as well by entering the bloodstream.

Traditional thinking assumes that when bad air is inhaled, it goes to your lungs and causes asthma or lung disease. According to Ziyad Al-Aly, MD,

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director of the Clinical Epidemiology Center at Washington University in St. Louis, Mo., that is all true “but it doesn’t stop there because those particles actually make it to your bloodstream. They travel in the bloodstream to the pancreas to suppress insulin secretion and to other organs to impair insulin sensitivity.”

Much more than simply a history lesson, last month the *Journal of the Endocrine Society* published “The Evolution of Insulin and How It Informs Therapy and Treatment Choices,” which not only serves as a primer, but it could also work as a practice tool for primary care physicians who have patients with diabetes. In “The Insulin Evolution” on page 30, Kelly Horvath takes a deep dive into this valuable article and discusses why it could be such a valuable resource for any physician practicing today.

Irl B. Hirsh, MD, professor of medicine at the University of Washington Medicine Diabetes Institute in Seattle, led the team that wrote the article and says that such a compendium had not been written for quite some time. “And now when we have all of these new insulins, it’s really kind of overwhelming, especially to the non-endocrinologists who maybe trained 10 or 20 years ago, or back in the 80s, like me,” he says. “This was a topic where there were no options. We didn’t have this kind of guidance; in those days, there was controversy over whether we should even be doing fingerstick glucose testing.”

As always, if you have any questions, comments, or even ideas for future articles, feel free to email me at: [mnewman@endocrine.org](mailto:mnewman@endocrine.org). 

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

CLINICAL  
PRACTICE  
GUIDELINES  
FROM THE ENDOCRINE SOCIETY

## Lipid Management in Patients with Endocrine Disorders

### A NEW STANDARD FOR CARE

Learn the latest best practices for assessing and treating high cholesterol in patients with endocrine diseases like hypothyroidism, menopause, and Cushing Syndrome.

#### Guideline Highlights:

- ▶ Obtain a lipid panel in adults with endocrine disorders to assess triglyceride levels and to calculate low-density lipoprotein cholesterol (LDL-C).
- ▶ Treat adults with type 2 diabetes and other cardiovascular risk factors with a statin in addition to lifestyle modifications, aiming for an LDL-C goal of < 70 mg/dL.
- ▶ Consider statin therapy, irrespective of the cardiovascular risk score, in adults with type 1 diabetes who are age 40 years and older, and/or have a history of diabetes of at least 20 years, and/or either microvascular complications, chronic kidney disease in stages 1-4, or obesity.

READ THE GUIDELINE AT  
[ENDOCRINE.ORG/LIPID2020](https://www.endocrine.org/lipid2020)

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## The Endocrine Society's AP-SIG Shares Adrenal and Pituitary Knowledge

**A**s *Endocrine News* reported in the August issue, the Endocrine Society launched a series of Special Interest Groups (SIGs) in 2019 to allow members with similar interests to come together to collaborate both within and outside the SIG.

The goal of the Adrenal and Pituitary Special Interest Group (AP-SIG) steering committee (currently chaired by Niki Karavitaki, MD, PhD and Lauren Fishbein, MD, PhD) is to create a platform to exchange knowledge, allow for networking, and promote excellence in adrenal and pituitary clinical care and research, with the goal to provide resources for all Endocrine Society members.

At **ENDO 2019**, the Society held an open forum on the EXPO floor to learn what the Endocrine Society members wanted from a SIG for adrenal and pituitary topics. The AP-SIG's steering committee has taken those excellent suggestions from the members and have begun to make them a reality. A major principle of the steering committee is that all ideas and all projects proposed by the SIG members are listened to and, if feasible, are put into practice.

The first objective has been to create a live webinar series to meet the needs of Society members. This is particularly relevant during the challenging COVID-19 era, which has transformed the landscape of medical and research training, education, and professional development.

The AP-SIG's first webinar, moderated by Lauren Fishbein, MD, PhD, was entitled "The Paper That Changed My Practice" and introduced papers chosen by members of the steering committee that were key to their clinical practice. The webinar covered topics including cardiovascular risk with mild autonomous cortisol secretion (Sona Sharma, MD), treatment of thyrotroph adenomas (Ismat Shafiq, MD), significance of ARMC5 gene variants in primary aldosteronism (Ricardo Correa, MD, EdD), and consequences of long-term Cushing's disease (Niki Karavitaki, MD, PhD).

There was a great discussion with numerous questions from attendees. For those questions that were not answered live, the responses were posted on the Community Connect chat board. If you were not one of the 160 people who tuned in live, you can join the over 180 colleagues who have watched the webinar online: [www.endocrine.org/the\\_paper\\_that\\_changed\\_my\\_practice](http://www.endocrine.org/the_paper_that_changed_my_practice).

### AP-SIG Steering Committee

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School of Medicine*  
**Co-Chair**

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*University of Birmingham*  
**Co-Chair**

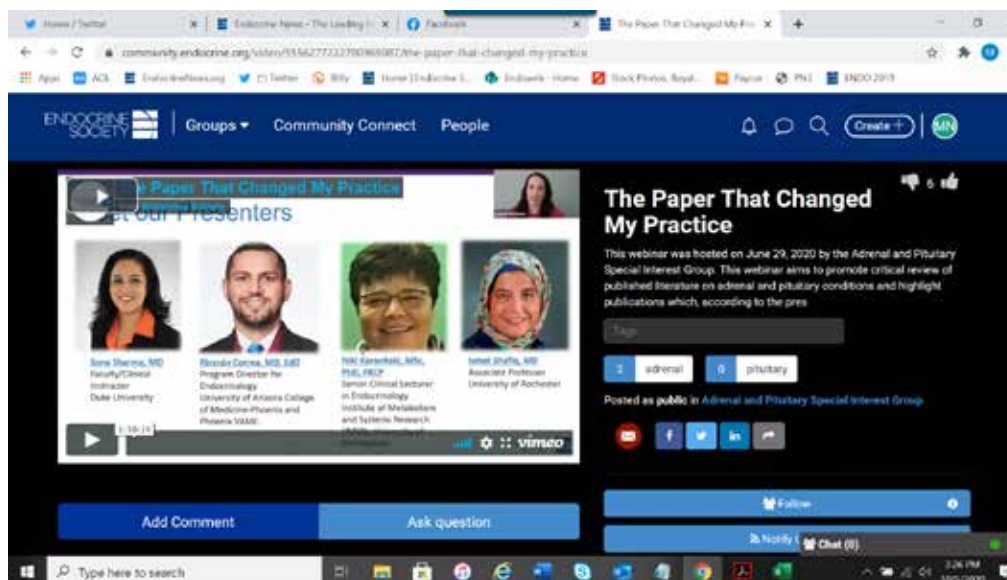
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*University of Arizona  
College of Medicine Phoenix*

Maria Perez-Millan, PhD  
*University of Buenos Aires*

Roberto Salvatori, MD  
*Johns Hopkins University*

Ismat Shafiq, MD  
*University of Rochester*

Sona Sharma, MD  
*Duke University*



On June 29, 2020, the AP-SIG hosted a webinar for its members called “The Paper that Changed My Practice,” which discussed papers chosen by members of the steering committee that were key to their clinical practice.

There have been numerous requests from the Endocrine Society membership for dedicated time to ask experts burning clinical questions. The AP-SIG responded to this call with a second webinar, “Ask the Experts” with Mark Molitch, MD, PhD, and Valeria de Miguel, MD, in pituitary and adrenal topics,

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**The programs and projects are created by members for members to increase the knowledge and interest on pituitary and adrenal topics, both clinical and research related.**

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respectively. Questions were submitted ahead of time and live during the webinar and were moderated by Ismat Shafiq, MD, and Ricardo Correa, MD, EdD.

The third installment of the webinar series will focus on subjects relevant to translational and basic researchers in adrenal- and pituitary-related topics. The AP-SIG has enlisted several Society members outside of the steering committee to help steering

committee members Lauren Fishbein, MD, PhD, and Roberto Salvatori, MD, organize this special and important webinar.

The AP-SIG embraces diversity and inclusiveness at every level. The programs and projects are created by members for members to increase the knowledge and interest on pituitary and adrenal topics, both clinical and research related. The committee’s vision for the AP-SIG is to achieve a high level of engagement from all Society members in a wide range of activities.

Finally, one of the most engaging ways for Endocrine Society members to connect is on the Society’s own Community Connect platform (<https://community.endocrine.org>). Across the SIGs, there have been engaging conversations and posts on many topics, and the adrenal and pituitary board is no exception. If you recently read an interesting paper or have a question about a clinical case or a laboratory method, please take advantage of the community of Society members and post to the board.

*If you are interested in participating in a webinar or have ideas for webinar topics or other activities, please reach out to Rylan Kepner: [rkepner@endocrine.org](mailto:rkepner@endocrine.org).*



MEMBERS  
in the  
NEWS

## Donald McDonnell, PhD, Honored by Susan G. Komen

**S**usan G. Komen®, the world's leading breast cancer organization, recognized Endocrine Society member and innovative breast cancer researcher Donald P. McDonnell, PhD, with this year's Brinker Award for Scientific Distinction in Basic Science, Komen's highest scientific honor.

Established by Komen in 1992, the prestigious Brinker Awards for Scientific Distinction recognize advances in both our understanding of the underlying mechanisms of breast cancer (basic science) and the clinical setting (clinical research), which are both essential to combating the disease.

McDonnell, the Glaxo-Wellcome professor of molecular cancer biology, Department of Pharmacology and Cancer Biology, professor of medicine, co-director, Women's Cancer Program, Duke Cancer Institute, Duke University School of Medicine, is being honored for his significant contributions to breast cancer research, which have been instrumental in advancing our understanding of estrogen receptor signaling in breast cancer. His research has resulted in critical insights into the structure, function, and regulation of nuclear hormone receptors and is helping to lay the foundation for the development and clinical use of novel endocrine therapies to treat estrogen receptor (ER)-positive breast cancer.

"Dr. McDonnell's innovative research has provided significant insights to the biology and pharmacology of the estrogen receptor and led to the development of new drugs for the treatment of hormone-dependent breast cancer. His leadership in the field and creative approach to translating laboratory-based discoveries to new cancer drugs will have a lasting impact on breast cancer research and care," says Komen's chief scientific advisor, Jennifer Pietenpol, PhD, executive vice president for research at Vanderbilt University Medical Center, director of the Vanderbilt-Ingram Cancer Center, and the B.F. Byrd, Jr., professor of molecular oncology.

McDonnell also received the Endocrine Society's 2020 Gerald D. Aurbach Award for Outstanding Translational Research Laureate Award earlier this year.





## Endocrine Society Welcomes European Commission's Chemical Strategy

**T**he Endocrine Society welcomed the European Commission's new Chemical Strategy for Sustainability and its measures to protect the public from endocrine-disrupting chemicals (EDCs). The communication was released in October as part of the European Green Deal.

The strategy is designed to be the foundation for the biggest update to Europe's chemical regulations in more than a decade. The chemical strategy commits to a hazard identification for endocrine-disrupting chemicals, including strict measures to prevent them from being used in consumer products. In addition, the strategy calls for stricter data requirements for EDCs across all relevant legislation and to accelerate the development and adoption of better test methods.

"EDCs are linked to serious health problems, such as infertility, diabetes, obesity, cancer, and issues with brain development," says Barbara Demeneix, BSc, PhD, DSc, chair of the Society's Endocrine-disrupting Chemicals Advisory Group. "We are pleased to see the European Commission has taken this significant first step towards further protecting the public from EDC exposure with its new chemical strategy. We now need further details and concrete actions to protect public health and minimize consumers' exposure to these hazardous chemicals."

The Commission also committed to introducing provisions for evaluating unintentional mixtures and will assess how best to address combination effects in the future.

In addition, the chemical strategy prioritizes control measures for poly- and perfluoroalkyl substances (PFAS) and addresses them with a group approach. These manmade EDCs have

leached into waterways and foods, and they can persist in the environment as well as our bodies. PFAS exposure is linked to health problems such as high cholesterol, disrupted thyroid function, and altered immune response.

The Society has dedicated years to pressing for science-based policies to regulate EDCs, which mimic, block, or otherwise interfere with the body's hormones. We are pleased the European Commission has announced its intention of adopting a hazard-based approach to regulating these harmful chemicals. However, the practical features and implementation steps will be important, and the Society urges the Commission to clarify these details to permit concrete actions without further delay.

EDCs are commonly found throughout our environment in consumer products, food containers, personal care products, pesticides, and furniture. EDCs contribute to serious health problems such as diabetes, obesity, neurodevelopmental disorders, and reproductive problems. Children, unborn children, and adolescents' developing bodies are particularly vulnerable to exposures.

A series of economic analyses found EDC exposures may be costing the EU upwards of €157 billion (\$177 billion) a year. Society experts led the effort to quantify the public health impact of EDCs on the economy.

The Endocrine Society will continue to monitor progress on legislative proposals to ensure that they are effective in minimizing exposure to EDCs.

## Endocrine Society Joins Coalition to Improve Insulin Access

**T**he Endocrine Society partnered with Beyond Type 1 to improve access for anyone in the U.S. struggling to obtain life-sustaining insulin.

Launched in October at **GetInsulin.org**, this new tool was created by global diabetes nonprofit organization Beyond Type 1 to connect those people who have diabetes and are on insulin to assistance programs and low-cost solutions that match their unique situation.

“Insulin is not optional for people with diabetes. The current drug pricing system that leaves many unsure of how to access their insulin needs to change, and that change will take time. Right now, there are assistance options out there for many struggling to access insulin, but individuals may not know about programs or those programs may be difficult to navigate,” says Beyond Type 1 CEO Thom Scher. “**GetInsulin.org** is designed to address this immediate and solvable problem — to simplify the process of getting people to the right help and getting them access to insulin in the immediate term.”

Beyond Type 1 advocates for high-quality, modern insulin to be available to people with diabetes regardless of employment or insurance status, across all demographics, without barriers, and at an affordable and predictable price point. Until that is achieved, **GetInsulin.org** will be a resource for those needing access to insulin options immediately.

Along with the Endocrine Society, **GetInsulin.org** is supported by a coalition of partners helping connect those in need to lower-cost insulin now, including the American Diabetes Association (ADA), the Association of Diabetes Care and Education Specialists (ADCES), Feeding America, JDRE, The Leona M. and Harry B. Helmsley Charitable Trust, the National Association for the Advancement of Colored People (NAACP), and the National Hispanic Medical Association (NHMA).

**GetInsulin.org** is funded by Lilly, Mylan, Novo Nordisk, and Sanofi.



## Five Endocrine Society Members Elected to the National Academy of Medicine

**E**ndocrine Society members Rexford Ahima, MD, PhD, Myles Brown, MD, Nancy Carrasco, MD, Mark Evers, MD, and Joel Hirschhorn, MD, PhD, have been elected to the National Academy of Medicine (NAM).

They are seven of the 90 regular members and 10 international members who were announced on October 19 at NAM's annual meeting. Election to the Academy is considered one of the highest honors in the fields of health and medicine and recognizes individuals who have demonstrated outstanding professional achievement and commitment to service. New members are elected by current members through a process that recognizes individuals who have made major contributions to the advancement of the medical sciences, healthcare, and public health.

- ▶ Ahima is a professor of medicine, public health, and nursing, Bloomberg Distinguished Professor of Diabetes, and director of the Division of Endocrinology, Diabetes, and Metabolism, Johns Hopkins University, Baltimore, Md. He was honored for innovative laboratory and translational studies that have elucidated the pathophysiology and potential therapies for obesity, diabetes, and related diseases.
- ▶ Brown is the Emil Frei III Professor of Medicine, Harvard Medical School, and director of the Center for Functional Cancer Epigenetics, Dana-Farber Cancer Institute, Boston, Ma. He was honored for his leadership in oncology and endocrinology, and whose seminal contributions have fundamentally reformulated the mechanistic understanding of hormone dependence of breast and prostate cancers, enabling the development of new therapies for these diseases.
- ▶ Carrasco is the professor and chair of molecular physiology and biophysics, and Joe C. Davis Chair of Biomedical Science, Vanderbilt School of Medicine, Nashville, Tenn. She was honored for making exceptional contributions to elucidating mechanisms by which ions and other solutes are transported

across biological membranes. Her work has broad impact and significance across biomedical fields ranging from biophysics and molecular physiology to cancer, metabolism, molecular endocrinology, and public health.

- ▶ Evers is the director, Lucille P. Markey Cancer Center; physician-in-chief of Oncology Service Line, UK Healthcare; professor and vice chair for research, department of surgery; and Markey Cancer Foundation Endowed Chair, University of Kentucky, Lexington. He was honored for his expertise on intestinal hormones and hormonal arcades in oncogenesis. His seminal insights defined the role of gut hormones on normal physiology and metabolism, pioneering innovative understanding of neuroendocrine cell biology and the role of neurohormonal pathways in the development and progression of neuroendocrine tumors.
- ▶ Hirschhorn is the chief, Division of Endocrinology, Boston Children's Hospital; Concordia Professor of Pediatrics and professor of genetics, Harvard Medical School; and member, Broad Institute of MIT and Harvard, Boston, Ma. He was honored for his development of methods and standards for performing and interpreting genome-wide association studies. He leads the Genetic Investigation of ANthropometric Traits (GIANT) consortium, which identified most currently known loci associated with stature and obesity.

"This distinguished and diverse class of new members is a truly exceptional group of scholars and leaders whose expertise in science, medicine, health, and policy will be integral to helping the NAM address today's most pressing health challenges and inform the future of health and health care for the benefit of everyone around the globe," says National Academy of Medicine president Victor J. Dzau. "It is my privilege to welcome these esteemed individuals to the National Academy of Medicine."



## Joy Wu Named Vice Chair of Basic Science at Stanford Department of Medicine

**L**ast month it was announced that Joy Wu, MD, PhD, has been appointed as vice chair, Basic and Translational Science, Department of Medicine, at Stanford University School of Medicine, Stanford, Calif.

In this new role, Wu will provide leadership and vision to further the basic science research mission in the department. Wu is a board-certified endocrinologist who specializes in treating women and men with osteoporosis and other bone diseases. She has a special interest in treating those at risk of bone loss from cancer therapies.

“Physician-scientists serve a unique and valuable role in biomedical research,” Wu says. “I am thrilled and honored by this opportunity to support the amazing research being done by our faculty in the Department of Medicine, with an emphasis on diversity and team science.”

As associate professor of medicine (endocrinology) at Stanford University School of Medicine, Wu directs a broad 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.

Wu is also the co-director of the Stanford Translational Investigator Program, which aims to recruit and mentor physician-scientists. She is passionate about training the next generation of physician-scientists.

Wu currently serves as a leader on the Endocrine Society’s Board of Directors where she works on initiatives that impact our members and the global endocrine community. She has also served as co-chair of the Trainee and Career Development Core Committee, and on the Leadership Development Task Force and the Publications Core Committee, where she chaired the search committee for the editor-in-chief of *Endocrinology*.

– Colleen Williams





BY DEREK BAGLEY  
Senior Editor

## Digenic Variants in Fibroblast Growth Factor 21 Signaling Linked to Severe Insulin Resistance

**V**ariants in genes that mediate fibroblast growth factor 21 — a hormone secreted by the liver that acts to regulate the body's response to starvation — have for the first time been linked to severe insulin resistance, according to a paper recently published in the *Journal of the Endocrine Society*.

Researchers led by Stephen Stone, MD, a pediatric endocrinologist at Washington University School of Medicine in St. Louis, report on the case of a 12-year-old female who presented with markers of insulin mediated pseudoacromegaly (IMPA), a rare insulin resistance syndrome. The patient had acanthosis nigricans, hirsutism, and acromegalic features characteristic of IMPA. “To date, the molecular mechanism for IMPA remains unknown,” the authors write. “However, it has long been hypothesized that these patients must harbor a defect downstream of the [insulin receptor] in which the glucose lowering property of insulin is impaired while the growth promoting activity of insulin is preserved.”

Stone and his team conducted biochemical and genetic studies on the female patient and her family, with the objective of defining the genetic and molecular etiology of IMPA. The authors describe the case study of the proband and her family, including the clinical workup that details the adolescent female's metabolic abnormalities as well as how these features have led to teasing from her peers causing her to experience depression.

The authors also detail the genetic testing performed on the proband, her parents, and her sister. “We identified 1,108 predicted deleterious

variants shared between the proband, her sister, and one of her parents,” the authors write. “This list was narrowed down to 11 candidate variants based on gene set enrichment analysis of relevant insulin and IGF1 pathways. From this list, we selected two rare, predicted deleterious variants in genes critical to the fibroblast growth factor 21 (FGF21) signaling pathway in [genes] *FGFR1* and *KLB* [which form a transmembrane receptor-cofactor complex that binds FGF21 and activates intrinsic tyrosine kinase activity and subsequent signal transduction].”

The researchers found that the proband has extremely elevated insulin and elevated serum FGF21 for her age and that in vitro studies showed that genetic variants of *FGFR1* and *KLB* reduced FGF21 signaling. “These studies suggest that the variants in *FGFR1* and *KLB* induce resistance to the insulin sensitizing effects of FGF21,” the authors write.

“We found that the proband carried mutations in the FGF21 receptor complex and performed tissue culture-based studies to demonstrate that these were functional/pathogenic mutations,” Stone tells *Endocrine News*. “This study demonstrates the first ever link between FGF21 and severe insulin resistance.”



“

We found that the proband carried mutations in the FGF21 receptor complex and performed tissue culture-based studies to demonstrate that these were functional/pathogenic mutations.

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This approach delivers significantly improved outcomes for patients on basal bolus insulin with multiple daily injections, while optimizing the use of clinical resources.  
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## Insulin Titration Software, CGM Improve Time in Range

**T**his past summer, Glytec published the first proof-of-concept study that combines Food and Drug Administration (FDA)-cleared remote insulin titration software and data from continuous glucose monitoring (CGM) systems. Results of the study showed a 26% increase in time in range for participants living with diabetes — an improvement from 48% at baseline to 74% after only four weeks of care.

The study evaluated 25 adults who used the Abbott Freestyle Libre CGM system and Abbott LibreLink app on their mobile phone. Patient data was provided to Glytec's Glucommander software — a cloud-based, FDA-cleared solution for outpatient basal-bolus insulin titration. All participants met the criteria of living with type 2 diabetes, reporting A1C levels > 8.0%, and owning a smartphone capable of running the LibreLink app.

The four-week study began with a nurse educator helping participants set up the Abbott Freestyle Libre 14-day CGM system while collecting baseline data. Participants went to the Atlanta Diabetes Associates office every two weeks for CGM sensor changes, and insulin titration was done during these visits or by phone on the weeks not requiring visits. To obtain updated doses, nurse educators reviewed participant CGM data, remotely generated dose updates from Glucommander, examined the recommendation, and passed it on to the patient. No intervention by the licensed provider was necessary.

Without this combined CGM and Glucommander approach, individuals living with diabetes in the outpatient setting rely on finger pricks and meters to measure blood glucose levels. Patients



using these methods traditionally visit their provider every few months to adjust insulin dosing based on historical data and can go years without achieving their optimal dosing regimen.

“This approach delivers significantly improved outcomes for patients on basal bolus insulin with multiple daily injections, while optimizing the use of clinical resources,” the authors conclude. “The combination of Glucommander software and CGM data can continually optimize insulin doses and improve outcomes while relieving the burden on patients and providers.”

# New Registry Tracks Hospital CGM Use During COVID-19 Pandemic

**D**excom recently announced the first ever registry dedicated to tracking the outcomes of patients and healthcare professionals using continuous glucose monitoring in hospitals in response to the COVID-19 pandemic.

The current standard of care for glucose monitoring in the hospital is a fingerstick blood glucose test, which requires healthcare providers to draw blood from a patient to obtain a glucose reading. Due to the need to preserve personal protective equipment, reduce potential hospital staff exposure to COVID-19, and lessen the overall burden on nursing care, Dexcom made their G6 CGM system available to remotely monitor the glucose levels of all hospitalized patients during the COVID-19 pandemic. The decision was made in April based on feedback received from the U.S. Food and Drug Administration (FDA).

“In our previous use of the Dexcom G6 system in our hospitals as part of exploratory studies over the last three years, we have found that the device improves glucose control without any increased risk in hypoglycemia,” says Endocrine

Society member Athena Philis-Tsimikas, MD, an endocrinologist and corporate vice president for the Scripps Whittier Diabetes Institute in San Diego, Calif. “More recently, we have begun using the system on some ICU and COVID-19 hospital floors where minimizing contact is important for both our patients and staff members. A registry to examine experiences across many hospitals would be hugely beneficial.”

The registry will be accessible to healthcare providers using rtCGM in an inpatient or critical care setting. Providers will be able to upload information regarding the in-hospital care of each CGM patient, such as admissions, discharges, medications, status changes, diabetes history, comorbidities, and more. The data collected will be deidentified and will not include any protected health information.

The data collected through the registry will eventually be cross-referenced with patient CGM data and evaluated by Dexcom for future product innovation or to include in future regulatory submissions to make rtCGM the ongoing standard of care in hospitals.



“

**We have begun using the system on some ICU and COVID-19 hospital floors where minimizing contact is important for both our patients and staff members.**

**A registry to examine experiences across many hospitals would be hugely beneficial.**

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# ENDO 2021

**Virtual Event • March 20 – 23, 2021**

**KEY DATES REGISTRATION BEGINS • November 18, 2020**

The all-virtual **ENDO 2021** will mirror the principal elements of **ENDO**, including top-flight educational programming, an interactive EXPO center, and networking opportunities. **ENDO 2021** is the leading global meeting for endocrinology research and clinical care. Join us for the most well attended and valued translational endocrinology meeting in the world. Bringing together leading experts, researchers, and the most respected clinicians in the field, **ENDO 2021** represents a convergence of science and practice that highlights and facilitates breakthrough discoveries in the field of endocrinology. Spend time connecting with peers and colleagues, exchanging ideas and information, and getting out in front of the latest trends and advancements in hormone health.

Abstract submission will still occur as planned, and abstracts will be presented virtually to all participants. All accepted abstracts will be published in a supplemental issue of the open access *Journal of the Endocrine Society* and will be assigned a DOI and indexed in PubMed and PubMed Central. The submission window opened on September 28 at: [endocrine.org/abstracts](http://endocrine.org/abstracts).

[www.endocrine.org/endo2021](http://www.endocrine.org/endo2021)

## Diabetes and Its Complications

**Livestream**

**November 12 – 14, 2020**

Anyone who provides care for people with diabetes knows that these patients often have a myriad of comorbidities and complications, and that optimizing their care is frequently complex and challenging. It is with these challenges in mind that Harvard Medical School faculty have developed this CME program, which will provide comprehensive updates, practice recommendations, and the newest evidence-based strategies for the treatment and care of the person with or at risk for diabetes.

<http://hmsdiabetescourse.com/>

## 18th Annual World Congress Insulin Resistance Diabetes & Cardiovascular Disease

**December 3 – 6, 2020**

**Live-Interactive-Online**

The World Congress on Insulin Resistance, Diabetes & Cardiovascular Disease (WCIRDC), now in its 18th year, is a global meeting dedicated to diabetes, obesity, lipids, cardiovascular disease, and energy balance. The goal of the conference is to link basic research to clinical practice in pursuit of its theme: Exploring New Frontiers in Metabolism — Tomorrow's Clinical Science Today. For nearly two decades, WCIRDC has brought researchers, physicians, clinicians, and other healthcare professionals together for an international program that bridges the latest developments from bench to bedside.

[www.wcir.org/](http://www.wcir.org/)

## 2020 Update on the Treatment of Pituitary Tumors: Emerging Therapies

**Live Virtual Experience**

**December 5, 2020**

**8:45 a.m. – 4:30 p.m. (EST)**

Presented by the Memorial Sloan Kettering Multidisciplinary Pituitary & Skull Base Tumor Center, this course is intended for endocrinologists, neurosurgeons, otolaryngologists, radiation oncologists, neurologists, ophthalmologists, neuro-oncologists, family medicine and internal medicine physicians, physicians in training, and other allied health professionals who treat and manage patients with pituitary diseases. This course aims to improve patient care and outcomes through evidence-based discussion of clinical practice guidelines and emerging therapies.

[mskcc.org/pituitarycourse](http://mskcc.org/pituitarycourse)



## Project ECHO

*Project ECHO events are live, interactive seminars using virtual platforms that allow participants to connect in real time to provide feedback on cases. Launched at the University of New Mexico in 2003, ECHO stands for Extension of Community Healthcare Outcomes, and it is built on the idea that while not everyone can be a specialist, all patients deserve access to specialty care.*

### Type 1 Diabetes Care and Management

Open to all clinicians, this virtual program seeks to educate primary care providers, care teams, and non-diabetes specialists in best practices for type 1 diabetes care and management. With many therapeutic and pharmacological options available, clinicians need additional resources to stay up to date. This program features live, interactive seminars and on-demand webinars, and will focus on evidence-based methods for addressing type 1 diabetes with a goal of improving health-related quality of life for patients and empowering clinicians to provide the best possible care.

[www.endocrine.org/project\\_echo\\_type1diabetescare](http://www.endocrine.org/project_echo_type1diabetescare)

### Using Insulin in Type 1 Diabetes

The second ECHO in this series will feature Diana Isaacs, PharmD, from Cleveland Clinic as she discusses different approaches to using insulin to treat people with type 1 diabetes. By the end of this program, attendees will be able to: Compare and contrast the various insulin options for type 1 diabetes; design an insulin treatment plan for a person newly diagnosed with type 1 diabetes; and modify an insulin regimen based on glucose data and individual factors.

[www.endocrine.org/project\\_echo\\_insulin\\_type1\\_diabetes](http://www.endocrine.org/project_echo_insulin_type1_diabetes)

## INTERNATIONAL ITINERARY

### Virtual 16th International Thyroid Congress

**December 16 – 20, 2020**

Sessions will include: Recent Advances in Thyroidology, Plenary Lectures, Symposium Lectures, and Award Lectures. All sessions will be prerecorded. There will be no meet the professor/debate and discussion and oral sessions/poster sessions.

[www.thyroid.org/16th-itc/](http://www.thyroid.org/16th-itc/)

### ICE 2020:

### 19th International Congress of Endocrinology

**Virtual Meeting**

**February 2021**

19th International Congress of Endocrinology (ICE 2020), 4th Latin American Congress of Endocrinology (CONLAEN), and 13th Congress of the Argentine Federation of Endocrinology Societies (FASEN) is organized by MCI Group – Argentina. Topics to be discussed include: big data and its impact in health, human diseases, artificial intelligence, and big-data mining; thyroid cancer diagnosis and treatment; advances in pheochromocytomas and paragangliomas; the tsunami of diabetes in lower- and middle-income countries; preserving reproduction in cancer patients; and so much, much more.

[www.ice-2020.com](http://www.ice-2020.com)

### 2nd BES Mayo Advanced Course in Endocrinology 2021

**February 21 – 23, 2021**

**Dhaka, Bangladesh**

The Advanced Course in Endocrinology is a collaboration between the Bangladesh Endocrine Society (BES) and the Mayo Clinic, Rochester, Minn. This intensive two-day, interactive course will cover all aspects of clinical endocrinology. Helmed by world-renowned faculty from the Mayo Clinic, this valuable course has garnered rave reviews from practicing endocrinologists throughout Southeast Asia.

<https://besmayo.com/>

“

One of the most effective interventions to help prevent or relieve burnout is true team-based care – having other members on the team take on roles and responsibilities for some of the aspects of care (and be accountable for their role in care). This approach gets everyone working together – less chaos, more cooperation and communication – that, along with work distribution/load reduction, helps reduce job dissatisfaction which usually precedes burnout and helps everyone focus on the patient.”

— M. Carol Greenlee, MD, Western Slope Endocrinology, in Grand Junction, Colorado, promoting team-based care for COVID-19 patients with diabetes in “Unprecedented: How COVID-19 Jumpstarted Diabetes Care Innovations” on page 22.

## MEMBER SPOTLIGHT

## Maigen Bethea, PhD



Maigen Bethea, a recent PhD graduate, has been a member of the Endocrine Society since 2017. She participated in the Society's Future Leaders Advancing Research in Endocrinology (FLARE) program where she was given the opportunity

to serve as an intern on the Trainee and Career Development Core Committee (TCDCC). Because of her exceptional leadership potential and especially creative ideas, Maigen was requested to stay on as a regular member.

Maigen has made many contributions to the Endocrine Society. As part of her role on TCDCC, Maigen substantially contributed to the revitalization of the Early Career Forum and Career Development Workshop programming. Despite being the most junior person on the committee, she was not afraid to share her ideas. In addition to her work on TCDCC, Maigen currently serves on the Society's Early Career Special Interest Group Steering Group, which helps develop activities and events that will benefit the Endocrine Society's Early Career members.

To learn more about some of the Endocrine Society's outstanding members, go to:

[www.endocrine.org/member-spotlight](http://www.endocrine.org/member-spotlight)

133 million



Number of Americans who suffer from chronic disease, including diabetes, and may rely on medication deliveries to receive life-saving drugs who could be affected over the current delays by the United States Postal Service

— SOURCE: YAHOO! FINANCE

494,390

The number of global monthly online searches of “endocrinologist,” ranking it as the second most googled STEM job. Of those searches, 301,390 are from internet users in the U.S.

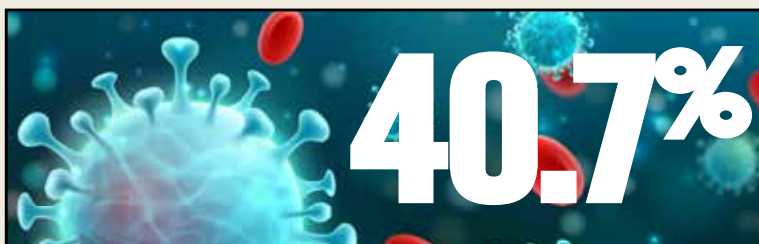
— SOURCE: AIRA



## Top Reasons for Using Telemedicine

- 45%** – Renewing prescriptions
- 42%** – Regular checkups
- 27%** – Looking into new conditions or symptoms
- 25%** – Discussing lab test results with their physicians

— SOURCE: EVERYDAY HEALTH



The amount of U.S. adults more susceptible to COVID-19 infections due to an underlying condition, with 30.9% of that group having obesity and 11.4% with diabetes.

— SOURCE: H. RAZZAGHI, ET AL., MMWR, VOL. 69, JULY 24, 2020



**ENDO**2021

MARCH 20–23, 2021

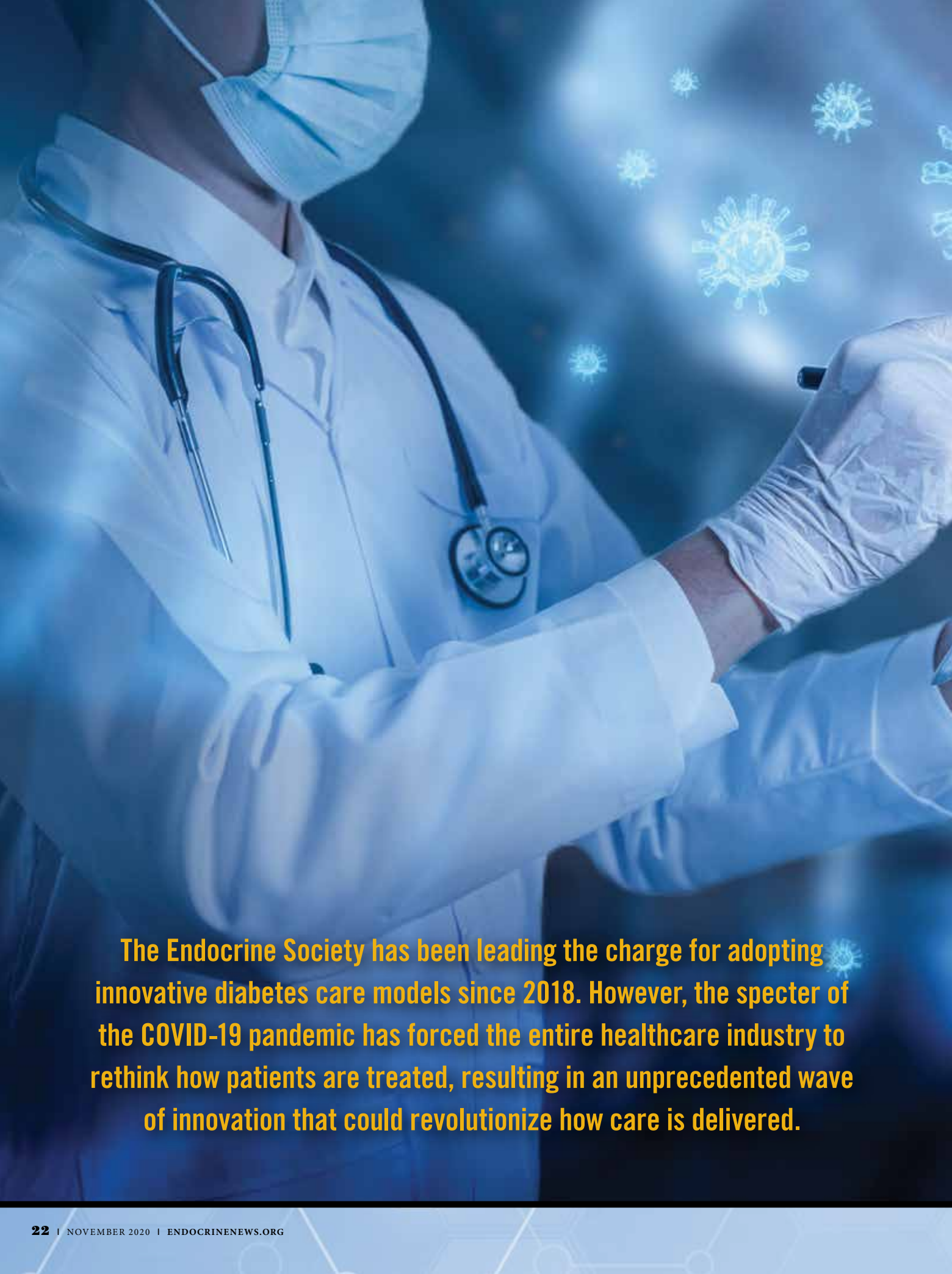
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**The Endocrine Society has been leading the charge for adopting innovative diabetes care models since 2018. However, the specter of the COVID-19 pandemic has forced the entire healthcare industry to rethink how patients are treated, resulting in an unprecedented wave of innovation that could revolutionize how care is delivered.**





BY DEREK BAGLEY

# UNPRECEDENTED:

## How COVID-19 Jump-started Diabetes Care Innovations

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**I**n early March, Robert A. Gabbay, MD, was sitting in his office where he was the chief medical officer of the Joslin Diabetes Center in Boston, when he got a knock (“more like a pound”) on his door. One of his staff members was relaying the news that someone on their team had tested positive for COVID-19.

“And that’s when it really hit,” he says. “We have to close this place down, and we have to transfer the care for 25,000 patients [with diabetes].”



This “new normal” has been hard on patients with diabetes. The disease is already extremely demanding in a non-COVID-19 world for those living with diabetes as well as their families. Now, these patients face the added burden of a highly contagious and deadly virus that can be especially damaging to those already living with this chronic illness.

**D**iabetes is and has been for a long time a global pandemic in its own right — a disease that now affects more than 500 million people worldwide, but an area of medicine that has not seen the strides many diabetes experts would have liked to see. More than 50% of those with diabetes fail to hit their glycemic targets, which minimize the risk of complications that can be made even more destructive by this novel coronavirus.

But in a year marked by a global pandemic, a sagging economy, civil unrest, and even murder hornets, there is at least one bright spot: COVID-19 has created an opportunity to rapidly implement and test models of diabetes care that were not possible before. These innovative models like telehealth have the potential to improve medical outcomes and the patient experience beyond the pandemic.

Gabbay and his team were able to pivot to new models of care for their patients with diabetes in just 10 days. This may sound like a familiar story; many of those treating diabetes in the year 2020 could probably tell their own version. “We need to change the way we provide care, considering that outcomes of people with diabetes have not improved over the last decade,” says Gabbay, who now serves as the chief scientific and medical officer of the American Diabetes Association in Arlington, Va. “Given the dual pandemics of COVID-19 and diabetes,

adoption of these innovations has accelerated in the hopes of creating a ‘new normal’ and improvements in the care we provide for people with diabetes.”

### “Necessity Is the Mother of Invention”

In 2018, the Endocrine Society convened a task force to examine and promote innovative models of care in diabetes, chaired by Gabbay, with members Shivani Agarwal, MD, MPH, of the Albert Einstein College of Medicine in Bronx, N.Y.; Michelle L. Griffith, MD, of Vanderbilt University in Nashville, Tenn.; Elizabeth J. Murphy, MD, PhD, of the University of California in San Francisco; M. Carol Greenlee, MD, of Western Slope Endocrinology in Grand Junction, Colo.; and Jeffrey Boord, MD, MPH, of the Parkview Health System in Fort Wayne, Ind.

Last month, the Innovative Models of Diabetes Care Task Force of the Endocrine Society published an article in *The Journal of Clinical Endocrinology & Metabolism* that not only reviews several models of care like telemedicine and e-consultations, but describes how the COVID-19 pandemic has jump-started many of the models that have until now limped along or have been stuck in legislative limbo. “Diabetes is an age old disease that cross cuts disciplines and has the potential to integrate with the technology sector to improve health outcomes, but due to siloed health systems



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We need to change the way we provide care, considering that outcomes of people with diabetes have not improved over the last decade. Given the dual pandemics of COVID-19 and diabetes, adoption of these innovations has accelerated in the hopes of creating a ‘new normal’ and improvements in the care we provide for people with diabetes.”

— ROBERT A. GABBAY, MD, CHIEF SCIENTIFIC AND MEDICAL OFFICER, AMERICAN DIABETES ASSOCIATION, WASHINGTON, D.C.



and reimbursement models that disincentivize innovation, treatment approaches have largely remained the same,” lead author of the JCEM paper Agarwal says. “While great strides in therapeutics have been made, these cutting-edge therapies are not reaching nearly enough people with diabetes to make a true impact on the global burden and to improve quality of life.”

This “new normal” has been hard on patients with diabetes. The disease is already extremely demanding in a non-COVID-19 world for those living with diabetes as well as their families. Now, these patients face the added burden of a highly contagious and deadly virus that can be especially damaging to those already living with this chronic illness.

“The pandemic has introduced more health anxiety for many people with diabetes,” Griffith says. “My patients hear the reports that people with diabetes are at higher risk of complications, and while that motivates them to take appropriate precautions, it’s also a challenging thing to deal with. I’ve had individual discussions with patients to help them think through risks and benefits of different challenges they face. Some patients have had to modify their jobs to reduce their risk.”

Patients with diabetes may even forgo care for fear of contracting COVID-19 by visiting their clinician or presenting to a hospital. But as the pandemic extends into its ninth month, endocrinologists and other healthcare providers are doing everything they can to alleviate those concerns and continue to deliver the best of care to patients with diabetes.

## AT A GLANCE

- ▶ Since 2018, the Endocrine Society has advocated for adopting innovative models of diabetes care, but these innovations have been hampered by a variety of factors.
- ▶ However, COVID-19 has jump-started innovation in healthcare delivery and allowed for real-world testing of diabetes care models in unprecedented ways.
- ▶ There’s still work to be done, and everything that held up these innovations pre-COVID-19 could return, so those treating diabetes should push to maintain innovation.



“The pandemic has introduced more health anxiety for many people with diabetes. My patients hear the reports that people with diabetes are at higher risk of complications, and while that motivates them to take appropriate precautions, it’s also a challenging thing to deal with.”

— MICHELLE L. GRIFFITH, MD, VANDERBILT UNIVERSITY, NASHVILLE, TENN.

“COVID made it necessary to figure out how to do things differently — they say ‘necessity is the mother of invention’ and many people have been very creative in figuring out how to deliver good care despite barriers such as PPE shortages and in-person clinic visits limited to only emergency care,” Greenlee says. “The advances in diabetes and other technology make virtual care possible and meaningful/beneficial. COVID also made the digital divide loom larger than ever — for access to education, working from home as well as medical care and follow-up.”

## Virtual Reality

This past year saw the rapid rise and expansion of meetings and social calls done over a webcam. Financial presentations, brainstorming sessions, visits with grandparents, happy hours, all held in this new virtual reality. Why not see patients that way as well?

Telehealth had indeed already been adopted by some institutions around the country, but this model of care wasn’t as widespread pre-COVID-19, for several reasons — technical difficulties, the inertia of physicians and patients preferring to visit the way they always have, and legislative hurdles. But the pandemic allowed physicians to clear some of those hurdles, as barriers to payment for virtual visits were suspended and doctors were no longer constrained to having to do an in-person visit to bill a patient’s insurance for the services.

“[Telehealth] also helped us rethink, what does the patient really need and what’s a way that’s more patient-centered and flexible to meet the patient’s needs without them having to do all the work,” Boord says. “What aspects of an office visit add value for the patient and are a helpful experience versus what

are not value added? And what can we do between visits and where can we change the model of care delivery so that we put the patients, education, services, and support where the patient needs them, not just where we put them.”

And as COVID-19 continues to push more diabetes care into this virtual space, some physicians are finding that they’re able to more effectively optimize their patients’ care. “Telemedicine visits are most effective when the information available to us for the visit matches what we have in the clinic,” Griffith says. “As more patients with both types of diabetes are using insulin pumps and continuous glucose monitors, we have an excellent source of detailed information available to us. When we gather that information from the patient by using a web-based service for them to download and share their information with us, and then discuss it with the patient, we have all we need to make glycemic management decisions.”

But while telehealth has streamlined diabetes care and physicians and their patients have mostly positive things to say about this new virtual paradigm, the task force authors point out in their paper that COVID-19 has forced the dissolution of in-person huddles and team meetings, which has made it more difficult to sustain team-based approaches, which the authors all agree is vital to diabetes care, especially as the number of people with diabetes far outstrips the number of endocrinologists in the world.

## Team Players

Here in 2020, team-based care is essential for treating patients with diabetes. As the population of people with diabetes grows and the number of endocrinologists remains stagnant, the need for those treating diabetes to team up is clearer than





As more patients with both types of diabetes are using insulin pumps and continuous glucose monitors, physicians have an excellent source of detailed information available to them.

ever — not just for the patients, but for the medical professionals as well. And again, the novel coronavirus has seen a number of healthcare professionals recognize more than ever the need to work together. The authors write: “In COVID-19, both outpatient and inpatient e-consults have been pivotal in enabling the specialty endocrinologist to provide timely and efficient consultation. In addition, it enables endocrinologist-led foundational education to providers who benefit from real-time feedback on cases, which can bring back joy to endocrinology work.”

“One of the most effective interventions to help prevent or relieve burnout is true team-based care — having other members on the team take on roles and responsibilities for some of the aspects of care (and be accountable for their role in care),” Greenlee says. “This approach gets everyone working together — less chaos, more cooperation and communication — that, along with work distribution/load reduction, helps reduce job dissatisfaction which usually precedes burnout and helps everyone focus on the patient.”

Greenlee shares some examples of this kind of collaboration: systems that use inactivated workers like dental and radiology staff to help patients prepare for telemedicine visits and tribal communities hit hard by COVID-19 using diabetes educators and other support staff to make check-in calls with homebound people with diabetes, both to educate on precautions as well as close follow-up of those infected. “With these calls often helping the patient maintain glycemic control and hydration and likely helping these patients avoid hospitalization,” she says.



“ COVID made it necessary to figure out how to do things differently — they say ‘necessity is the mother of invention’ and many people have been very creative in figuring out how to deliver good care despite barriers such as PPE shortages and in-person clinic visits limited to only emergency care.”

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

# THE IMPACT OF CGM ON HOSPITALIZED COVID-19 PATIENTS

Even though COVID-19 has roiled the world for about nine months now, the medical community is still learning how this virus impacts people, especially those who are already dealing with a chronic illness like diabetes.

According to Robert Vigersky, MD, chief medical officer of Medtronic Diabetes, professor of medicine at the Uniformed Services University of the Health Sciences, and past president of the Endocrine Society, while it's clear there are risk factors associated developing COVID-19 and more severe outcomes in type 2 diabetes, it's not clear whether the same holds true for patients with type 1 diabetes.

And in patients with diabetes (even those without diabetes) who are hospitalized with coronavirus, glycemic control is the name of the game. "Hyperglycemia is generally a marker for severity of illness," Vigersky says. "Whether you have diabetes that has been well controlled or not, if you get admitted to the hospital with COVID or an acute illness, severe hyperglycemia is a risk factor for poor outcomes because glucose is a distress marker."

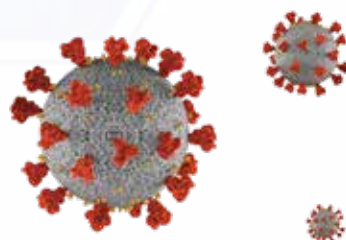
However, Vigersky points to the proceeds of a consensus conference published in *The Journal of Diabetes, Science, and Technology* by Galindo, et al., which states that in an acute illness like COVID-19 continuous glucose monitoring (CGM) should not be relied upon to manage a patient's diabetes, especially for patients in intensive care. "There are many factors that can affect the accuracy of CGM in a critical care setting, whether you have COVID or not. This increases the risk of making the wrong decisions about insulin therapy for instance," Vigersky says.

Still, Vigersky sees the potential value for CGM in non-ICU settings, where the technology can reduce the exposure of the medical staff to a patient who has COVID-19. "Watching the glucose trend on a CGM monitor outside the patient's room compared to going into the room to do multiple finger sticks a day reduces the risk of contact with an infectious patient," he says.

"Whether or not this is a meaningful exposure reduction in terms of the risk of medical staff getting COVID from the patient, I think remains to be seen," Vigersky continues. "We don't have any data about that."

“

There is no way to get anything done without a team approach. This has never been more obvious than in COVID where internationally, scientists and healthcare professionals are putting their heads together to fight a common goal.”



— SHIVANI AGARWAL, MD, MPH,  
ALBERT EINSTEIN COLLEGE  
OF MEDICINE, BRONX, N.Y.

The task force authors also point to pharmacist-based interventions, since studies have shown that a pharmacist-physician collaborative care model can lead to significant improvements in diabetes care, as well as the tele-mentoring program Project ECHO, which aims to train more primary care providers in diabetes care and “enhances the reach of endocrinology far beyond specialist capacity, holding great promise for continued reach of new therapeutics to the masses.”

“There is no way to get anything done without a team approach,” Agarwal says. “This has never been more obvious than in COVID where internationally, scientists and healthcare professionals are putting their heads together to fight a common goal.”

## Call to Action

When this issue goes to press, COVID-19 will have killed more than 220,000 people in the U.S. Make no mistake: This is a vicious, dangerous virus that has forced the entire world to adopt new ways of living. But again, endocrinologists are well positioned to take the lead on caring for patients who are most vulnerable to this pandemic.

“At Montefiore Medical Center in the Bronx, we had approximately 7,000 admissions for COVID from March to June 2020 and approximately 40% of those had diabetes,” Agarwal says. “I saw a tremendous amount of diabetes and


Telehealth also helped doctors rethink, what does the patient really need and what's a way that's more patient-centered and flexible to meet the patient's needs without them having to do all the work.



hyperglycemia in the hospital in patients with coronavirus disease in a very short period of time and was able to appreciate how unique COVID's effect on diabetes was both from a medical and operational perspective.”

The Endocrine Society was already taking steps to better care for patients with diabetes, and this novel coronavirus has forced those who treat patients with diabetes to adopt some novel models of care. Still, there's more work to be done, and these innovations and their sustainability face threats. Once the pandemic ends, all the things that held up innovations prior COVID-19 could reemerge: lack of reimbursement, lack of infrastructure to sustain and generalize innovation, lack of training and efforts, lack of leadership interest.

“Failure to embrace innovation, we do at our own peril,” Boord says. “But by being actively engaged in innovation and having Society members actively pursuing innovation in diabetes care, the Society and our Society membership and members of the endocrinology profession are leading the way. We’re not sitting back and waiting for others to define what innovation in endocrinology care looks like. We should define that and help chart the way for healthcare as a whole.”

“For the first time, we have a unified global experience,” Agarwal says. “The piece we wrote [in *The Journal of Clinical Endocrinology & Metabolism*] is a call of action to push and maintain innovation together.” 



“Failure to embrace innovation, we do at our own peril. But by being actively engaged in innovation and having Society members actively pursuing innovation in diabetes care, the Society and our Society membership and members of the endocrinology profession are leading the way. We’re not sitting back and waiting for others to define what innovation in endocrinology care looks like. We should define that and help chart the way for healthcare as a whole.”

— JEFFREY BOORD, MD, MPH, PARKVIEW HEALTH SYSTEM, FORT WAYNE, IND.

— BAGLEY IS THE SENIOR EDITOR OF *ENDOCRINE NEWS*. HE WROTE THE SEPTEMBER COVER STORY ON THE USE OF ARTIFICIAL INTELLIGENCE TO TREAT OSTEOPOROSIS.



Packaging for  
insulin vials in  
Germany,  
circa 1945.



# The Insulin Evolution

More than simply a history lesson, a new paper in *Endocrine Reviews* looks at insulin's advances since its discovery a century ago. A team led by Irl B. Hirsch, MD, has created an overview of informed treatment options as well as a comprehensive guide that will prove to be an invaluable resource for at least another hundred years.

**E**ndocrinologists worldwide are gearing up for a very important centennial — the 100th anniversary of the discovery of therapeutic insulin by physiologist John J. R. Macleod, surgeon Frederick C. Banting and his student Charles Best, and biochemist James B. Collip.

Since this Nobel Prize-winning discovery in 1921, insulin has helped millions of people lead healthier lives and is worthy of the highest commendation as the central treatment of diabetes, a scourge affecting more than 400 million people globally. But there's still more to celebrate. A team led by Irl B. Hirsch, MD, professor of medicine at the University of Washington Medicine Diabetes Institute in Seattle, recently published "The Evolution of Insulin and How It Informs Therapy and Treatment Choices" in

BY KELLY HORVATH



“The field has exploded to the point that it is very confusing for clinicians to keep track of the subtle differences, as these new insulins continue to come out. In the late 1980s when I was in my endocrine fellowship training, we were just getting used to human insulin and phasing out animal insulin in that era. **Now we’re contending with all of these new insulin analogs, especially in the last 20 years.**”

— IRL B. HIRSCH, MD, PROFESSOR OF MEDICINE, UNIVERSITY OF WASHINGTON MEDICINE DIABETES INSTITUTE, SEATTLE, WASH.



Insulin pumps are just one of the many advances made in the past 20 years that improve insulin delivery.

the October issue of *Endocrine Reviews*. As the title suggests, this paper provides a pharmacopoeia for exogenous insulin.

Since the first isolation of insulin from animal pancreata a century ago, a lot has happened, starting with commercial production of insulin soon after its discovery and taking off from there.

Development of types of insulin has “exploded,” explains Hirsch. Indeed, the expansion of insulin formulations as well as their various routes of administration offers patients with diabetes an array of treatment options. However, in order for a select therapy to work as it should, the prescribing clinician must truly understand it.

“The field has exploded to the point that it is very confusing for clinicians to keep track of the subtle differences, as these new insulins continue to come out,” Hirsch says. “In the late 1980s when I was in my endocrine fellowship training, we were just getting used to human insulin and phasing out animal insulin in that era. Now we’re contending with all of these new insulin analogs, especially in the last 20 years.”

### One-Stop Insulin Shop

Innovation in the field of insulin development has led to numerous formulations that resemble





the endogenous insulin response — a highly advantageous outcome — by altering the insulin molecule, which influences its mechanism of action. Ay, there's the rub. Achieving the desired mechanism of action in the desired time frame requires keeping track of which formulation does what. Adding an extra layer of complexity, the reality in the U.S. is that clinicians do not usually have the say-so when it comes to which formulation to prescribe, a choice typically made by an insurance company or otherwise based on what the patient can afford.

"With so many insulins now available," Hirsch says, "we felt that we needed to give a comprehensive review of their pharmacokinetics and pharmacodynamics and how they differ. They're not all the same." Thanks to Hirsch and team, if a clinician has to prescribe an insulin he or she does not have much experience with, this guide will explain the ins and outs of all things insulin from injectable

versus inhalable formulations, to rapid-acting versus long-acting, concentrated versus mixed, to follow-on biologics.

"There are huge problems when somebody is doing fine on one regimen, such as a basal insulin and a prandial insulin, and then they get switched either because of the insurance company, or they're admitted to the hospital and the insulin they were on is not on that formulary," Hirsch says. "What does the clinician have to know about what the patient was on to switch them to whatever is on the formulary in the hospital?"

Now, instead of having to consult multiple sources to figure out how to administer the new formulation and have it work as effectively as the patient's original, the clinician has the information all in one place — with extremely useful graphical and tabular comparisons. "What's really nice about this paper is that you don't have to read the whole thing, you can just go read about that insulin," Hirsch says.

Hirsch and team, which includes Rattan Juneja, one of Hirsch's research fellows in the '90s who now works for Eli Lilly, recognized the clear and urgent need for this "Insulin How-To." "I trained him on insulin, now he works for a pharmaceutical company, and it was really the two of us who decided to do this," Hirsch says. "Nothing has been done like it in a long time. And now when we have all of these new insulins, it's really kind of



To access the complete text of "The Evolution of Insulin and How It Informs Therapy and Treatment Choices" in the October issue of *Endocrine Reviews*, go to: <https://academic.oup.com/edrv/article/41/5/733/5836295>.



“I’m sure there will be more insulins coming out over time, and I’m sure there will be more research, especially looking at comparisons of these different insulins and so forth, **but I think this paper is going to stand the test of time.**”

— IRL B. HIRSCH, MD, PROFESSOR OF MEDICINE,  
UNIVERSITY OF WASHINGTON MEDICINE DIABETES INSTITUTE, SEATTLE, WASH.

overwhelming, especially to the non-endocrinologists who maybe trained 10 or 20 years ago, or back in the ‘80s like me. This was a topic where there were no options. We didn’t have this kind of guidance; in those days, there was controversy over whether we should even be doing fingerstick glucose testing.”

## Insulin Onslaught

The field has advanced rapidly, so rapidly in fact, that about 95% of what Hirsch and his team’s paper covers is new. “I’m hoping this gets referenced frequently in the literature because I don’t think there’s anything like this out there right now,” he says. “I’m very proud of it, and I’m very proud of my co-authors. We really put a lot of time into this.”

Of course, the biggest benefit of all is improved patient care and fewer clinician mistakes. By and large, it’s the primary care provider prescribing insulin to a patient. Hirsch is considering an abridged version of the paper with less biochemical detail that would be targeted to that audience. “Having said that, for a fellow trying to learn all of this — ‘drinking from a fire hose’ is the analogy — this is the perfect article for somebody getting into this for the first time right now,” Hirsch says. “I’m sure there will be more insulins coming out over time, and I’m sure there will be more research, especially looking at comparisons of these different insulins and so forth, but I think this paper is going to stand the test of time.”

It’s no accident that Hirsch and his team’s paper published just before the 100th anniversary of the discovery of insulin. Unfortunately, the pandemic has curtailed some of the planned celebrations. Nevertheless, the paper reveals the true scope of what the advent of insulin has done for humankind. “This paper will give you all the details of what has happened in the last century,” Hirsch says. “But I think the most important thing it will do is put in perspective how far we’ve come in the last 20 years out of the last 100.” **EN**

— HORVATH IS A FREELANCE WRITER BASED IN BALTIMORE, MD. IN THE OCTOBER ISSUE, SHE WROTE ABOUT THE UNDERLYING EFFECTS OF OBESITY ON COVID-19 PATIENTS.



A 1971 Canadian postage stamp commemorating the 50-year anniversary of insulin’s discovery.

## AT A GLANCE

- ▶ As we approach the centennial of the discovery of insulin, the breadth of advances made in just the past 20 years requires a comprehensive review of insulin analogs.
- ▶ This guide can be used as a quick consult when encountering an unfamiliar insulin formulation or as an in-depth course in currently available insulins.
- ▶ Understanding the pharmacodynamics and pharmacokinetics of available insulins will help clinicians meet their patients’ needs.





# Airborne Toxic Events:

## Air Pollution's Role in Diabetes

Among the environmental disruptors that contribute to the development of diabetes, air pollution is gaining the spotlight. Airborne microscopic endocrine disruptors not only get in the lungs but also find their way into the bloodstream where they can cause organ damage, specifically to the pancreas.

BY ERIC SEABORG





**H**ealth professionals uniformly endorse wearing a mask to lower the risk of contracting COVID-19. But have you considered recommending masks for avoiding diabetes?

Air pollution is receiving growing attention as one of the most important endocrine-disrupting chemicals (EDCs) in the environment that contribute to the risk of developing diabetes. And a specific component of air pollution gaining prominence is particulate matter — especially the particles 2.5 micrometers in diameter or smaller known as PM2.5 that can find their way into the lungs and bloodstream.

“A number of researchers have found that air pollution from very fine particulate matter has a strongly supported association with diabetes,” says Namino Glantz, PhD, of the Sansum Diabetes Research Institute in Santa Barbara, Calif. “It is a mixture of organic chemicals — dust, soot, and metals — all compressed together into these tiny particles less than the thickness of a human hair. Those particles are so small we can inhale them. They get deposited in our lungs, and then get passed into the bloodstream.”

“A meta-analysis of seven studies on PM2.5 found that with every 10 micrograms per cubic meter increase in PM2.5 concentration, diabetes risk increased by 25% with chronic long-term exposure,” Glantz says.

“People used to think that when you inhale bad air, it goes to your lungs and gives you asthma or lung disease,” says Ziyad Al-Aly, MD,

**“A number of researchers have found that air pollution from very fine particulate matter has a strongly supported association with diabetes. It is a mixture of organic chemicals — dust, soot, and metals — all compressed together into these tiny particles less than the thickness of a human hair. Those particles are so small we can inhale them. They get deposited in our lungs, and then get passed into the bloodstream.”**

— NAMINO GLANTZ, PHD, SANSUM DIABETES RESEARCH INSTITUTE, SANTA BARBARA, CALIF.



“ People used to think that when you inhale bad air, it goes to your lungs and gives you asthma or lung disease. That is all true, but it doesn’t stop there because those particles actually make it to your bloodstream. **They travel in the bloodstream to the pancreas to suppress insulin secretion and to other organs to impair insulin sensitivity.**”

— ZIYAD AL-ALY, MD, DIRECTOR, CLINICAL EPIDEMIOLOGY CENTER, WASHINGTON UNIVERSITY, ST. LOUIS, MO.

director of the Clinical Epidemiology Center at Washington University in St. Louis. “That is all true, but it doesn’t stop there because those particles actually make it to your bloodstream. They travel in the bloodstream to the pancreas to suppress insulin secretion and to other organs to impair insulin sensitivity.”

Al-Aly was the lead author of a huge study published in *Lancet Planetary Health* in 2018 that involved a longitudinal cohort of 1.7 million U.S. veterans, air data from the U.S. Environmental Protection Agency (EPA) and NASA, and a synthesis of previous evidence to calculate the global burden of diabetes attributable to PM2.5. “We tried to figure out how many diabetes cases in the world and in the U.S. are attributable to air pollution, and the figure was about 14%,” Al-Aly tells *Endocrine News*.

## And the Other Suspects

Although air pollution has received attention from several studies lately, it should not be forgotten that many other EDCs contribute to diabetes, according to Robert M. Sargis, MD, PhD, an associate professor in the Division of Endocrinology, Diabetes, and Metabolism at the University of Illinois at Chicago who has published extensively on EDCs and diabetes.

“Most, if not all, folks in the developed world are exposed to chemicals like phthalates and bisphenol A, and these chemicals have been associated with diabetes risk,” Sargis says. He notes that problem chemicals associated with diabetes include pesticides like DDT — which was banned in 1972, but whose metabolites are still present in the vast majority of Americans — as well as PCBs, which were also banned in the 1970s but persist in the environment.

## Environmental Quality Index

Researchers have been noting for some time that caloric excess and physical inactivity do not fully account for the rise of diabetes prevalence, so there must be other factors at work, according to Jyotsna S. Jagai, PhD, research assistant professor in the Department of Environmental and Occupational Health Sciences at the University of Illinois at Chicago. Jagai was part of a team that developed for the EPA the Environmental Quality Index (EQI), a county-level measure that considers indicators of the quality of air, water, land, the built environment, and sociodemographics. Jagai’s team looked at the association of environmental quality and diabetes in a study published in the *Journal of Diabetes Investigation* in 2019.

Although overall, counties with poor environmental ratings actually had a lower rate of diabetes prevalence, the researchers discovered urban-rural and wealth-level dichotomies in the results. “In rural environments, poor environmental quality is associated with a higher rate of diabetes prevalence, and areas with relatively worse sociodemographic factors were also associated with higher rates of diabetes,” Jagai says.

## Airborne Health Disparities

Sargis, who was a co-author of that study, notes that this association of diabetes, pollution, and sociodemographics is especially poignant at this time of heightened awareness of racial inequity. “We know that communities of color and low-income communities are disproportionately exposed to air pollution as well as a number of different chemicals that have been linked to

diabetes,” Sargis says. It’s well-established that African American, Hispanic-Latino, and Native American populations have higher levels of diabetes.

A study in *Diabetes* in 2017 examined the effects of exposure to nitrogen dioxide and PM2.5 pollution among Latino children in Los Angeles, Calif. It concluded that these exposures may contribute to the development of type 2 diabetes through direct effects on insulin sensitivity and pancreatic beta-cell function. Because car and truck exhaust are major contributors to PM2.5, it’s easy to see how an urban environment like Los Angeles could lead to higher risk.

The particulates can affect pancreatic beta-cells, but they also have much more generalized effects on oxidative and inflammatory responses and insulin resistance.

Sargis notes that EDCs can cause “impairments in insulin secretion and action, disruptions in other nuclear hormone receptors that regulate fat development and function, like PPARs and RXR, as well as disruptions of glucocorticoid receptor signaling. They can compromise a whole bunch of different mechanisms, including oxidative stress, endoplasmic reticular stress, sex steroid action, and thyroid hormone action.”

## Advice and Action

Endocrinologists can apply this knowledge in advising their patients, these researchers agreed. “It is a little tricky because some of these chemicals are ubiquitous,” Jagai says. “But I think physicians can help patients understand that there are certain products and certain things that might put them at higher risk for endocrine-disrupting chemicals. Physicians can help identify those exposures and explain how to reduce them.” For example, a physician can explain about staying inside on high air pollution days or finding different walking routes for exercising that minimize exposure.

“Environments are modifiable,” Sargis says. “What we need to do as a community is to start to recognize that the environment matters.”

Endocrinologists might consider voicing these dangers when it comes to government policies, but back to those masks: Their benefits could be both long term and immediate; a study published this year in *Science of the Total Environment* found that during the early days of the pandemic in Milan, Italy, poor air quality and higher particulate levels were associated with increased daily cases of COVID-19. Glantz notes that type 2 diabetes is a pre-existing condition that can exacerbate COVID-19 effects, and the additional stress of PM2.5 exposure could add up to a “perfect storm.” <sup>EN</sup>



## AT A GLANCE

- ▶ As evidence continues to accumulate that endocrine disruptors contribute to the development of diabetes, air pollution — and especially small particulate matter — is receiving increasing attention.
- ▶ Airborne particulate matter can not only infiltrate the lungs but travel through the bloodstream to damage organs like the pancreas.
- ▶ Endocrine-disrupting chemicals are widespread in the environment, so endocrinologists can advise patients about their dangers and how to avoid them.

— SEABORG IS A FREELANCE WRITER BASED IN CHARLOTTESVILLE, VA. IN THE OCTOBER *ENDOCRINE NEWS*, HE WROTE ABOUT THE USE OF CERTAIN STEROIDS TO TREAT COVID-19 PATIENTS.

# Q&A:

## Connie Newman, MD



**Endocrine News talks with Connie Newman, MD, chair of the committee that created the latest Endocrine Society Clinical Practice Guideline on Lipid Management in Patients with Endocrine Disorders.**

**A**ccording to the latest Clinical Practice Guideline issued by the Endocrine Society, all adults with endocrine disorders should be tested for high cholesterol and triglycerides to evaluate their risk of heart attack or stroke.

“Lipid Management in Patients with Endocrine Disorders: An Endocrine Society Clinical Practice Guideline” was published online last month and will appear in the December 2020 print issue of *The Journal of Clinical Endocrinology & Metabolism*. This guideline provides an approach to assessing and treating high cholesterol and triglycerides in patients with endocrine diseases such as hypothyroidism, menopause, and Cushing’s syndrome.

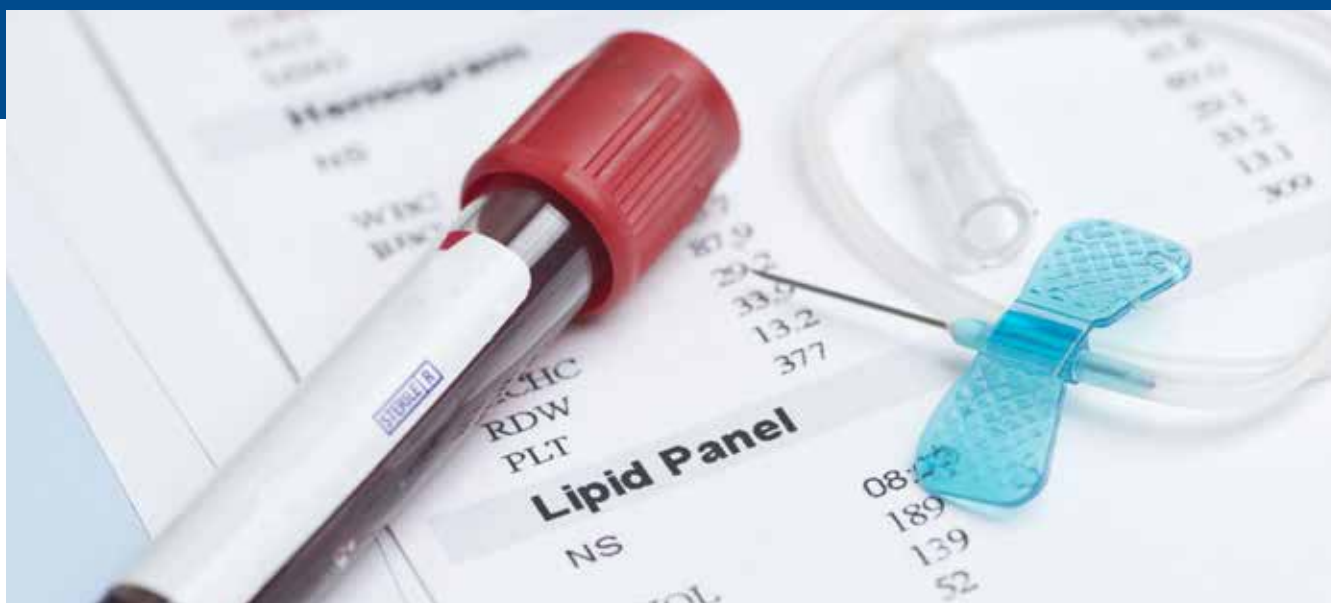
“This guideline is the first of its kind,” says Connie Newman, MD, New York University Grossman School of Medicine, New York, N.Y., chair of the committee that wrote the guideline. “We hope that it will make a lipid panel a routine test in adults with endocrine diseases and cause a greater focus on assessment of the risk of heart disease and stroke.”

Newman shares her thoughts with *Endocrine News* about how this new guideline will make lipid panel tests routine in patients with endocrine diseases, influence the decision-making process about treatment for clinicians in other specialties, and key take-home messages for patients.

**Endocrine News:** What was the main reason for the publication of the lipid management in patients with endocrine disorders guideline — what drove the decision and why now?

**Connie Newman:** Hormones modulate every pathway involved in lipid metabolism. Therefore, it is not surprising that some endocrine diseases are associated with an abnormal lipid profile and increased risk of atherosclerotic





cardiovascular disease (ASCVD), which is the primary cause of death in the U.S. However, with the exception of type 2 diabetes, endocrine diseases are not discussed in detail in cholesterol management guidelines. This guideline was written to address this gap in information. The guideline describes the lipid profile and atherosclerotic risk in individuals with selected endocrine diseases and evaluates the degree to which treatment of the endocrine disease improves dyslipidemia. The guideline also makes recommendations about the use of lifestyle modification and medications to lower lipids and lipoproteins.

**EN:** What are your hopes for the impact of the guideline on endocrine standards of care for patients with endocrine disorders and lipid abnormalities?

**CN:** This guideline is the first of its kind, and the committee hopes that it will make a lipid panel and ASCVD risk assessment a routine test in adults with endocrine diseases. As discussed in the guideline, Cushing syndrome, Cushing disease, high dose glucocorticoid therapy, adult growth hormone deficiency, acromegaly, and hypothyroidism enhance ASCVD risk. This knowledge may guide therapy to lower LDL cholesterol (LDL-C) by favoring initiation or intensification of statins and other medications as adjunct to lifestyle modification.

Other recommendations that could change clinical practice include the measurement of coronary artery calcium to refine risk assessment when the decision about statin treatment is uncertain, the use of a highly purified eicosapentaenoic acid (EPA) ethyl ester to reduce ASCVD in statin-treated adults with diabetes and triglycerides above 150 mg/dL, ruling out hypothyroidism before prescribing statins to lower LDL-C, and checking the lipid panel after treatment of hyperthyroidism when the patient is euthyroid.

“Hormones modulate every pathway involved in lipid metabolism. **Therefore, it is not surprising that some endocrine diseases are associated with an abnormal lipid profile and increased risk of atherosclerotic cardiovascular disease, which is the primary cause of death in the U.S.**”

— CONNIE NEWMAN, MD, NEW YORK UNIVERSITY GROSSMAN SCHOOL OF MEDICINE, NEW YORK, N.Y.; CHAIR, GUIDELINE WRITING COMMITTEE

## KEY TAKE-HOME MESSAGES FOR PATIENTS

- ▶ Ask your physician about your cholesterol and triglyceride levels.
- ▶ Some endocrine diseases worsen the lipid profile and may increase the risk of heart disease and stroke, or the risk of pancreatitis (inflammation of the pancreas).
- ▶ High levels of low-density lipoprotein cholesterol (LDL-C) increase the chances of a heart attack or stroke.
- ▶ Very high levels of triglycerides may lead to pancreatitis.
- ▶ A healthy diet, physical activity, and weight loss for people with overweight or obesity are important for improving and maintaining health, and may reduce LDL-C and triglycerides.
- ▶ Statins, added to diet and exercise, are the medicines of choice for lowering LDL-C and have been proven to reduce heart disease and stroke.
- ▶ Statins have been taken by millions of people for more than 30 years. Serious side effects of statins are rare, and muscle aches are likely not caused by the statin.


“Practitioners in other medical specialties such as family practice, internal medicine, cardiology, and nephrology should become aware of the impact of endocrine diseases on lipids, ASCVD risk, and pancreatitis, **and take this into account when making decisions about treatment.**”

— CONNIE NEWMAN, MD, NEW YORK UNIVERSITY GROSSMAN SCHOOL OF MEDICINE, NEW YORK, N.Y.;  
CHAIR, GUIDELINE WRITING COMMITTEE

In addition, the guideline attempts to clarify the uncertainty about the age at which to start statins in individuals with type 1 diabetes and advises consideration of statin use to lower LDL-C in adults with type 1 diabetes, who may be younger than 40 years of age but have microvascular complications or a 20-year history of type 1 diabetes. The guideline also addresses the effect of steroids on HDL-C and points out that very low HDL-C levels suggest anabolic steroid use.

### **EN:** How do you expect other medical specialties to be affected by the Guideline Writing Committee's recommendations?

**CN:** Practitioners in other medical specialties such as family practice, internal medicine, cardiology, and nephrology should become aware of the impact of endocrine diseases on lipids, ASCVD risk, and pancreatitis, and take this into account when making decisions about treatment.

Also, I would like to thank Andrea Hickman of the Endocrine Society and the members of the writing committee for their many contributions to this guideline. 

### **Other members of the Endocrine Society writing committee that developed this guideline include:**

**Michael Blaha, MD, MPH**, Johns Hopkins Ciccarone Center for the Prevention of Heart Disease in Baltimore, Md.; **Jeffrey Boord, MD, MPH**, Parkview Health System in Fort Wayne, Ind.; **Bertrand Cariou, MD, PhD**, Nantes University Hospital, Nantes, France; **Alan Chait, MD**, University of Washington, Seattle, Wash.; **Henry Fein, MD**, Sinai Hospital, Baltimore, Md.; **Henry Ginsberg, MD**, Columbia University, New York, N.Y.; **Ira Goldberg, MD**, New York University Grossman School of Medicine, New York, N.Y.; **M. Hassan Murad, MD**, Mayo Clinic Evidence-based Practice Center, Rochester, Minn.; **Savitha Subramanian, MD**, University of Washington, Seattle, Wash.; and **Lisa Tannock, MD**, University of Kentucky, Lexington, Ky.



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*Endocrine News* speaks with the Endocrine Society's 2020 Roy O. Greep Laureate Award winner for Outstanding Research, Eleftheria Maratos-Flier, MD, who discusses her research focusing on obesity, challenges for female researchers, and her own goals outside the lab.



# An Appetite for Research

**E**leftheria Maratos-Flier, MD, professor of medicine at Harvard Medical School, is the recipient of the 2020 Laureate Award for Outstanding Research. While still caring for patients at Boston's Beth Israel Deaconess Medical Center, Maratos-Flier moved her research work from her Harvard laboratory to the Novartis Institutes for Biomedical Research just about two years ago and has welcomed the new challenges blossomed by the transition.

In her work to solve the mysteries of obesity and its metabolic complications, Maratos-Flier has defined the role two important molecular mediators of the interactions between the periphery and the brain: fibroblast growth factor 21 (FGF21) and melanin concentration hormone (MCH).

Named in honor of Roy O. Greep, PhD, renowned Harvard scholar and the Endocrine Society's 45th president, the award is presented for meritorious contributions to research in endocrinology. *Endocrine News* spoke with Maratos-Flier to learn more about her path to becoming one of the leading endocrine researchers in the country today.

**Endocrine News:** What did the recognition for outstanding research mean to you, especially with your Harvard University connection with Dr. Greep?

**Maratos-Flier:** I am extremely honored to get the award and am very grateful to the Endocrine Society. Dr. Greep was obviously interested in hormonal regulation. And because my area is metabolism, I felt kinship with him. Having the Harvard connection made it even better.

**BY GLENDA FAUNTLEROY SHAW**



“ I would like to figure out what we can do operationally to help women do research. **Based on what I’ve seen, it’s more of a challenge for women to do research in an academic environment.**”

— ELEFThERIA MARATOS-FLIER, MD, PROFESSOR OF MEDICINE AT HARVARD MEDICAL SCHOOL, CAMBRIDGE, MASS.

**EN:** How did the study of obesity and its complications become the pinpoint of your research?

**Maratos-Flier:** I originally, like in the dark ages of my career, started working on viruses that caused diabetes. And at a certain point I realized I was very unhappy in that area because there was no way to do clinical correlations with humans, and I just felt it wasn’t really going in the direction I wanted it to go. I was trying to think of an interesting area that was important and was more involved with metabolism. So, in about 1992, it was clear that the hypothalamus was going to be important in terms of appetite regulation. At the same time, some very nice techniques were emerging that could let people who were interested look at what genes might be important in the brain that were involved in appetite regulation.

So, I decided to look at the difference between genes that are in the hypothalamus of obese animals and compared to animals that are lean. And when we looked at the differences in gene expression one of the genes that popped up is a gene called melanin-concentrating hormone. So, we thought this might potentially be an appetite-regulating hormone. My lab pursued that, and it turned out, yes, it regulates appetite. And then with some really good collaborators, we made mice that had too much and we made mice that didn’t have enough. And you know we injected it into rats and were able to show that increased feeding significantly. Other studies showed it regulates aspects of behavior in mammals.

**EN:** What do you miss most about your Harvard laboratory and team?

**Maratos-Flier:** I miss that when you have a lab, you can say “hey I want to ask this question” and then you can pursue the experiment to find the answer. One of the other nice

things about having a lab is you pick the people you’re going to work with, and I really liked my team.

**EN:** Can you share any goals you have outside of the lab?

**Maratos-Flier:** I would like to figure out what we can do operationally to help women do research. Based on what I’ve seen, it’s more of a challenge for women to do research in an academic environment.

**EN:** What do you see as the main obstacles?

**Maratos-Flier:** I think one thing is mentorship. I think that’s a significant issue. There are some people who are great mentors, and there are some who are really toxic mentors. And I think that for success in academic research, you need to give people who take on major childrearing responsibilities more of a chance to stay at rank and not feel that they need to get promoted. I think that whoever takes childrearing on, and usually it’s mom, has difficulties trying to juggle the childcare and [academic duties] like writing manuscripts.

People talk a lot about the issues, but I don’t think there are great solutions. Institutions offer a limited number of scholarships to buyout some of your time if you need it, and those are usually directed at women and underrepresented minorities, but it’s really not enough. In my view, \$30,000 is nice but you can’t run a lab with \$30,000. And I also think that at most institutions, junior faculty and also women don’t really get enough advice from more experienced faculty. Getting feedback is important. It’s somebody who is more senior telling you “hey this grant proposal or research topic isn’t such a great idea” or that it’s a good idea. These are just some of the things I’d like to address in a manuscript and see if there is anything that can be done to implement them. **EN**

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



# Hunting High and Low:

## Virtually Monitoring Glucose in Hospital Settings

BY ERIC SEABORG

Hospitals that have implemented a virtual glucose management system have seen reduced glycemic events. Flagging records of patients who stray out of range enables adjustments in treatment.

One day at the three hospitals in the University of California San Francisco (UCSF) system, clinicians making rounds saw new notes pop up in patients' charts. The alerts warned that a patient's high or low glycemic levels had been flagged by the system and suggested adjustments in their glycemic care.

The notices were part of a "virtual glucose management system" that resulted in decreasing the rates of both hyperglycemic and hypoglycemic events by about 40%.

The glucose management system was built into the hospital's EPIC electronic health records system at the request of Robert J. Rushakoff, MD, medical director for Inpatient Diabetes at the University of California San Francisco Medical Center.

The system flags any patient who has had two or more hyperglycemic glucose values (225 mg/dL or higher) or a hypoglycemic value (less than 70 mg/dL). In the 700 beds of the system, it may flag 20 or so patients and queue them up for Rushakoff to review remotely at 5:30 or 6:00 every morning.

## Reviewing the Records

On each flagged patient, Rushakoff can call up a window that shows him the key glycemic information on each patient, such as insulin dosing; any medication that affects blood sugar, like glucocorticoids; enteral feeding rates; and relevant lab tests such as kidney function. “You can see just about everything that is going on with that patient right off the bat. Then, if needed, you look at the orders to find out what they have done, and if some change is needed, you put in a new consult note,” Rushakoff says.

“When a note is opened, it automatically opens up this little prefilled note saying why this note is appearing, what the blood sugars in the past 24 hours have been, and then I can choose from a drop down menu on whether the patient is eating or not eating, and the kind of insulin orders they should be on,” Rushakoff explains. “It takes two clicks to enter in a suggestion on what change should be made, and then it shows up in the chart notes as a glucose management note.”

It takes about a half hour to have notes ready for when these patients are seen by their primary teams later in the day.

“We didn’t tell anyone we were doing this; we just started doing it. Right when they are about to see the patient in the morning, they get a note that confirms what they know they should do but may have been reluctant to make aggressive changes. The note basically is just-in-time education,” Rushakoff says. “And because this was a glucose management note, people would read them. We had discovered that regular consult notes would often be unread.”

## Alerting the Staff

The hospital staff definitely noticed the new alerts, according to Robert Wachter, MD, chair of the Department of Medicine. In a web interview with the editor of *JAMA*, Wachter tells a story of doing rounds as the ward attending. “I asked my resident if we had heard from the consultants. She said, ‘Infectious disease dropped a note and cardiology dropped a note ... and we’ve been Rushakoffed.’”

“Rushakoffed? What do you mean?” Wachter asked.

“Dr. Rushakoff sent a note that we need to adjust the insulin.”

**“ We didn’t tell anyone we were doing this; we just started doing it. Right when they are about to see the patient in the morning, they get a note that confirms what they know they should do but may have been reluctant to make aggressive changes. The note basically is just-in-time education. And because this was a glucose management note, people would read them. We had discovered that regular consult notes would often be unread.”**

— ROBERT J. RUSHAKOFF, MD, MEDICAL DIRECTOR  
FOR INPATIENT DIABETES, UNIVERSITY OF CALIFORNIA  
SAN FRANCISCO MEDICAL CENTER,  
SAN FRANCISCO, CALIF.

“The burgeoning use of telemedicine and the rapid reimbursement policy changes that came with it have really changed the conversation in a way that could enable us to implement such a program. **I can now propose a virtual diabetes consultation via telemedicine that will not only improve quality of care and patient outcomes, but also be financially self-sufficient with reimbursement for the consultation.**”

— ARCHANA SADHU, MD, DIRECTOR, SYSTEM DIABETES PROGRAM, HOUSTON METHODIST, HOUSTON, TEXAS

“It turns out that these suggestions are highly welcomed by people,” Wachter says. “One of the worries you have is that these notices are going to be annoying or people are going to reject unbidden consultations. It turns out that we follow his recommendations essentially 100% of the time because he is better at this than we are.”

## Changes in Reimbursement

Archana Sadhu, MD, director of the System Diabetes Program at Houston Methodist, tells *Endocrine News* that when she first heard about the UCSF program she wanted to implement something similar at her institution. “The program is amazing for quality improvement for patients with instant access to expert recommendations for diabetes management,” she says. “But what stopped us from going forward was the question of a business plan for the resources.”

She says that Rushakoff coordinates and handles the workload for his institution, but Houston Methodist has “a different structure. We are a system of eight hospitals with over 7,000 affiliated physicians and almost 2,400 operating beds. We would require at least one full-time position or several for seven-days-a-week coverage, without the usual reimbursement that a traditional in-person consultation would allow.”

But she said that the COVID-19 epidemic may change these financial conditions: “The burgeoning use of telemedicine and the rapid reimbursement policy changes that came with it have really changed the conversation in a way that could enable us to implement such a program,” Sadhu says. “I can now propose a virtual diabetes consultation via telemedicine

that will not only improve quality of care and patient outcomes, but also be financially self-sufficient with reimbursement for the consultation.” The system’s smaller hospitals could particularly benefit from a virtual glucose management system because they currently do not have readily available inpatient diabetes teams.

Sadhu’s health system has a main hospital with an in-person inpatient diabetes consultation service, but it also includes seven smaller “community hospitals that don’t have the luxury of inpatient endocrinology consults like we do here at our main academic largest campus.” The smaller hospitals could particularly benefit from a virtual glucose management system.

Wachter says that questions about reimbursement remind him that there was no payment model for the hospitalist specialty when it first came on the scene. But it became the fastest-growing specialty in the history of medicine when studies showed that the position improved care and resulted in shortening hospital stays. Lowering hospital costs will grow in importance as bundled payment models spread, he notes.

Though formal endocrinology consultations are still needed for some diabetes patients, Rushakoff points out that the system can replace the need for inpatient diabetes management teams, which are time- and resource-intensive. He says he gets at least an inquiry a week from colleagues interested in exploring some variation of a virtual glucose management system.<sup>EN</sup>

— SEABORG IS A FREELANCE WRITER BASED IN CHARLOTTESVILLE, VA. IN THE OCTOBER *ENDOCRINE NEWS*, HE WROTE ABOUT THE USE OF CERTAIN STEROIDS TO TREAT COVID-19 PATIENTS.





## Endocrine Society Advocacy Win: European Commission Includes Endocrine Society Recommendations in Chemical Strategy

On October 14, the European Commission issued a Communication describing the European Union's "Chemicals Strategy for Sustainability Towards a Toxic-Free Environment," as part of the EU Green Deal. The strategy is designed to be the foundation for the most significant update to Europe's chemical regulations in more than a decade.

The Endocrine Society has advocated for prioritization of endocrine-disrupting chemicals (EDCs) in the strategy, and we are pleased to report that the strategy includes many key measures advocated by the Endocrine Society to protect the public and the environment from endocrine-disrupting chemicals (EDCs). These include:

- ▶ committing to a hazard-based approach to identify EDCs, including strict measures to prevent them from being used in consumer products;
- ▶ calling for stricter data requirements for EDCs across legislation and accelerating the development and adoption of better test methods in line with scientific knowledge;
- ▶ committing to introducing provisions for evaluating unintentional mixtures to assess how best to address combination effects in the future;
- ▶ prioritizing control measures for poly- and perfluoroalkyl substances (PFAS) and to address them with a group approach; and

- ▶ calling for introducing EDCs as substances of very high concern under REACH and in CLP legislation.

The strategy reflects our input and consistent pressure to policy makers in the EU, led by the Endocrine Society's EU EDC Task Force, chaired by Barbara Demeneix, PhD, which was instrumental in achieving these important results. Members of the Task Force participated in high-level meetings with the European Commissioner for Health and the Commissioner for the Environment, as well as meetings with Commission staff and members of the European Parliament. We also wrote directly to executive vice president Frans Timmermans in collaboration with a group of international scientific societies to share our public-health-focused positions.

The Communication represents an important and positive first step toward concrete legislative actions; however, additional details remain to be determined, and the expertise of Endocrine Society members will continue to be important as the Commission and other policy-making bodies in the EU work toward implementation of the strategy.

Be on the lookout for additional opportunities to weigh in and ensure that your voice is heard as we continue to educate policy makers around the world about EDCs and how science-based regulatory controls can improve public health.

# November Elections: What Will Be the Impact on Endocrine Society Policy Agenda?

As this issue of *Endocrine News* went to press, the outcome of the November elections was far from certain. Recent national polling gave Democrats a 69% chance of winning the Senate majority, with incumbent Republicans at risk in Arizona, Colorado, Maine, and North Carolina, and even in normally reliably Republican states like South Carolina, Iowa, Montana, Alaska, and two seats in Georgia. Forecasts suggested Democrats were highly likely to maintain or even expand their majority in the House of Representatives.

Recognizing that polls can be wrong, news events can shift voting trends, and the possibility of a contested presidential election dragging on for weeks in the courts is extremely real, the Endocrine Society has looked at what a change in presidential administration and/or congressional majority could mean for its policy agenda and provided a few predictions:

## Immediate Priorities

The “lame duck” period and first 100 days of a Biden administration will likely be dominated by urgent efforts to mitigate the health and economic consequences of the COVID-19 pandemic, prevent a government shutdown, and possibly protect access to healthcare.

## Coronavirus Emergency Relief

While passing another piece of legislation to provide relief has been a focus of debate, how to address the cost of the legislation along with issues about supporting local and state governments and assistance for individuals and unemployment benefits has left congressional negotiations with the administration in gridlock.

We expect this to remain unfinished through the election and possibly end of the year, and to become the first bill passed by a newly sworn-in Democratic Congress in January. The Endocrine Society will continue to advocate for measures that

Biden Photo: YASAMIN JAFARI TEHRANI / Shutterstock.com



Trump Photo: Frederic Legrand - COMED / Shutterstock.com

will benefit physicians and researchers, including expansion of telehealth coverage and increased funding for research.

## Appropriations

Funding for the federal government will expire on December 11. To avoid a government shutdown, Congress must enact either another continuing resolution or full-year FY2021 appropriations for every discretionary federal department, agency, and program.

We expect a good-faith effort toward completing the FY2021 appropriations process by December 11, particularly since it is a vehicle that could carry an emergency package responding to coronavirus — but the scale of the political obstacles suggest another continuing resolution into the new administration would be likely. We also expect that many Democrats who predict majorities in both the House and Senate may also prefer delaying final action until February when it will be able to achieve more of its funding priorities.

## Affordable Care Act

Just after Election Day, the U. S. Supreme Court will hear oral arguments on a lawsuit seeking to overturn the Affordable

Care Act (ACA). The chances of the law being wholly or partly overturned appear greater if Amy Coney Barrett is confirmed as a new justice cementing a 6 — 3 conservative majority. Depending on the scope of the decision, the consequences could be far-reaching: 21 million people insured through ACA exchanges or Medicaid expansion made possible through the ACA could lose their coverage, 60 million Medicare beneficiaries might pay more for preventive care and prescription drugs, and all Americans could lose critical protections against discrimination based on pre-existing conditions and lifetime caps on expensive treatments.

A decision invalidating the ACA in whole or in part — in the midst of a deadly pandemic — could throw the entire U.S. healthcare system into turmoil and affect ambitious plans like Medicare for All or a public insurance option. A decision invalidating the ACA reached anytime in the winter or spring would require immediate action by Congress and the administration to mitigate the consequences and place every other priority on the back burner. We will continue to advocate for access to affordable healthcare, including opposing pre-existing condition clauses and supporting protections for all vulnerable populations and continuation of anti-discrimination provisions in the ACA.

## Change in Agenda

Beyond these immediate and urgent priorities, the agenda pursued by a Biden administration and Democratic House and Senate would be much different than the past four years. On many issues, a Biden administration may be inclined toward moderation, incrementalism, and efforts at bipartisan compromise, while congressional Democrats may be influenced more strongly by progressive voices agitating for systemic change. These internal dynamics — and the size of Democratic congressional majorities — may also play a role in determining whether to eliminate the filibuster and even change the composition of federal courts.

It bears repeating that a “blue wave” in the 2020 election resulting in Democratic control of the executive and legislative branches is not certain. However, the Endocrine Society is thinking about how a new power dynamic could affect our policy agenda and planning to adapt to what could be a new world.

# Congress Approves Continuing Resolution Through December 11

As Congress was not able to come to an agreement on the appropriations bills to fund the federal government for the next fiscal year (FY) in advance of the September 31 deadline, policy makers instead passed a Continuing Resolution that essentially funds the government

at the prior year levels through December 11, 2020. While it was important to avoid a shutdown in the midst of a pandemic, the Endocrine Society and other biomedical research advocates are disappointed that Congress was unable to agree on a full-year appropriations package with robust funding for the National Institutes of Health (NIH) and emergency supplemental funds to help federal researchers recover and continue important work on national health priorities.

Moving the deadline for FY2021 funding past the election gives lawmakers more flexibility, but it means that we and others will need to keep up pressure over these important weeks to ensure that Congress completes their job and delivers a full-year package that funds the NIH and other research funding agencies at appropriate levels. Please visit the Endocrine Society's advocacy webpage at: [www.endocrine.org/take-action](http://www.endocrine.org/take-action) for details on how you can add your voice and join our campaign.





Diabetes

Diabetes

high blood sugar levels in  
insulin is the hormone th  
regulates glucose in the  
chronic conditions that

## Diabetes Advocacy Leading Up to November's Diabetes Awareness Month


**E**ndocrine Society has been an active leader on Capitol Hill advocating for diabetes prevention, coverage, and research programs. Here are some highlights of our recent activities:

On October 5, the Society hosted a virtual congressional briefing focused on how the National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK) addresses racial and ethnic disparities. The purpose of the briefing was to educate congressional offices about the work the NIDDK is doing on this issue to build support for increased funding. The panel included Griffin Rodgers, MD, the director of NIDDK. Rodgers focused his presentation on how NIDDK has been working to address disparities in its research. The briefing also included a presentation from Endocrine Society past president Dale Abel, MD, PhD, who discussed the Society's FLARE program as an example of how the NIDDK is supporting researchers in these efforts. If you're interested, you can watch a recording of the briefing on the Endocrine Society's website at: [www.endocrine.org/advocacy/priorities-and-positions/diabetes](http://www.endocrine.org/advocacy/priorities-and-positions/diabetes).

In October, the Society hosted a Virtual Hill Day to build support for reauthorizing the Special Diabetes Program (SDP) and funding for the National Institutes of Health (NIH). Funding for the SDP, which is a critical program for diabetes research and prevention, is scheduled to expire on December 11. Due to the COVID-19 pandemic, there have been significant

disruptions to important biomedical research happening at the NIH. During our Hill Day, Endocrine Society members met with their congressional representatives to discuss the need for a five-year reauthorization of SDP and \$15 billion in supplemental funding for the NIH.

On October 27, the Endocrine Society hosted a congressional briefing on the Special Diabetes Program for congressional offices. The panel included Endocrine Society member Al Powers, MD, from Vanderbilt University and the NIDDK's Rodgers. Powers and Rodgers focused their presentations on the important research being done on type 1 diabetes, which is an important part of SDP. The briefing also featured Chief Beverly Cook, a member of the National Indian Health Board. Cook, who is a family nurse practitioner, focused her presentation on the importance of the Special Diabetes Program for Indians (SDPI), which funds prevention programs for American Indians and Alaska Natives.

The Society will continue to advocate on these important issues. We encourage you to take action on this by contacting your representative and senators directly. Please visit our online advocacy campaign to learn about how you can advocate for NIH funding and the Special Diabetes Program. You can find more information at: [www.endocrine.org/take-action](http://www.endocrine.org/take-action). 



# What the Tech?

Technological advances continue to change the face of diabetes treatment.

COMPILED AND WRITTEN BY COURTNEY CARSON

From continuous glucose monitoring (CGM) to cutting-edge insulin pumps, diabetes technology has come a long way. Devices are getting easier and easier to use, are less invasive, and offer more options so doctors and patients can work together to find the best treatment options.

There are more choices than ever, from basic designs to more advanced models that have all the bells and whistles. Here, we've rounded up some of the newest

devices making their way into the diabetes technology ring that may be beneficial to your patients.

Decades after the invention of insulin pump, diabetes management has encountered a technology revolution with the introduction of CGM, sensor-augmented insulin pump therapy, and closed-loop/artificial pancreas systems, and we are expectant of all of the advances that will be made over the next decade and beyond.

## iGlucose® Cat-M Cellular Connected Diabetes Blood Glucose Monitor ►

iGlucose is the first blood glucose monitor on the market powered by Cat-M technology, new cellular technology that provides broad geographic coverage, deep building penetration, and longer battery life and was developed specifically for devices used in remote patient management and telemedicine. Utilizing the iGlucose platform, patients simply test their blood glucose and the data is immediately transmitted to their physician's office or designated healthcare provider. The real-time data and ability to communicate with patients provides clinicians with an active feedback loop (text/email), enabling more up-to-date recommendations that can help to improve patient outcomes between visits.

[www.smartmetercorporation.com](http://www.smartmetercorporation.com)



## ◀ OneTouch Reveal Featuring Noom

LifeScan, maker of the OneTouch® brand, is collaborating with Noom®, described as “the world’s leading behavior change company which has been disrupting the weight loss and healthcare industries,” integrating the OneTouch Reveal® app with Noom’s digital diabetes and weight loss management program. Through this pilot, people with type 2 diabetes using the OneTouch Reveal app, a mobile diabetes management tool that can help people with diabetes remotely track their blood sugar from their wireless device and easily share results with their healthcare team and loved ones, will get free access to OneTouch Reveal and Noom’s Diabetes Management Program, integrated through Apple Health Kit.

[www.lifescan.com](http://www.lifescan.com)



### ► Xeris Ready-To-Use Gvoke Glucagon – G.Voke Hypopen

Gvoke HypoPen is a glucagon injection for the treatment of dangerously low blood sugar in people with diabetes who are at least two years of age. Xeris Pharmaceutical's Gvoke is a room-temperature, liquid, stable glucagon that is ready-to-use in an emergency. Because Gvoke does not require mixing prior to use, it will be "ready-to-inject" (like an EpiPen for allergies).

Available in two doses: a 0.5 mg/0.1 mL dose for children and a 1 mg/0.2 mL dose for adolescents and adults, Gvoke has a shelf life of two years when kept at room temperature.

[www.gvokeglucagon.com](http://www.gvokeglucagon.com)



### ◀ Tandem Control-IQ



Control-IQ technology is an advanced hybrid closed-loop system that uses an algorithm to automatically adjust insulin in response to predicted glucose levels to help increase time in the ADA-recommended target range (70-180 mg/dL). The first approved interoperable automated glycemic controller device, Tandem Control-IQ works with a compatible insulin pump and a compatible continuous glucose monitor, closing the loop and delivering and adjusting insulin automatically. A recent trial showed that participants using the closed-loop technology spent 10% more time-in-range than a control group manually adjusting their own insulin dosage.

[www.tandemdiabetes.com](http://www.tandemdiabetes.com)

### ► iLet Bionic Pancreas

The iLet Bionic Pancreas System, a wearable designed to automatically control blood sugar levels, is unlike traditional insulin pumps in that it doesn't need any input from the patient about dietary intake or insulin delivery rates, and bolus doses aren't needed to compensate for meals or to correct abnormal levels. The device can function as an insulin-only delivery device, a glucagon-only bionic pancreas, or as a bihormonal device that can provide both insulin and glucagon. The glucagon-only option is not beneficial to people with diabetes but may be for people with conditions such as congenital hyperinsulinism. Users can choose to pair the iLet pump with one of two compatible CGMs: the Dexcom G6 or Senseonics' 90-day implantable Eversense. The company is also pursuing an iLet capable of delivering both insulin and glucagon.

[www.betabionics.com](http://www.betabionics.com)



### ◀ NovoPen Echo®



The NovoPen Echo® is a durable pen designed to help children manage insulin dosing more confidently. The device features memory functions including time elapsed since the last dose and the amount of the last dose volume for extra reassurance. With half-unit increments, NovoPen Echo offers fine-tuned dosing and an end-of-dose click alert. The pen comes in two colors and features a choice of fun skins making it even more kid-friendly.

[www.novonorodisk.com](http://www.novonorodisk.com) 

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# Insulin: Essential for Life

## WHAT IS INSULIN?

Insulin is a hormone made by the pancreas. It helps carry sugar from the blood into the cells. The cells use the sugar as energy for the body to work. If you have type 1 diabetes (T1DM), your body makes very little or no insulin. That's why you need to take insulin. If you have type 2 diabetes (T2DM), your body makes too little insulin or can't use the insulin it makes properly. You must take insulin if you have T1DM. You may need to take insulin to help better manage your blood sugar levels if you have T2DM.

## INSULIN RESISTANCE VS. INSULIN SENSITIVITY

### more insulin needed

#### risk factors

- Overweight and obesity
- Lack of exercise
- High blood sugar levels
- High triglyceride levels
- Acute illnesses
- High blood pressure
- Inflammation and genetics

### less insulin needed

#### positive lifestyle changes

- Eat a heart-healthy diet
- Be active and exercise
- Reduce your stress
- Get enough quality sleep each night

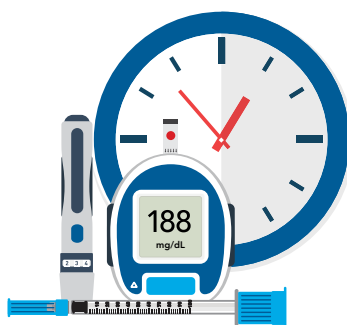
## WHICH TYPE IS WHICH?

The type of insulin you take is based on three factors: how long it takes to start working (**onset**), when it is at its strongest action (**peak**), and how long it lasts (**duration**). Some types of insulin are called **basal insulins**. These last longer and give you a steady dose of insulin throughout the day and night. Other types are called mealtime, rapid, or **bolus insulins**. These usually last a shorter time but give you a greater amount of insulin to handle the spikes in blood sugar after a meal.

	BASAL		BOLUS		
	Intermediate-acting	Long-acting	Short-acting	Rapid-acting	Fast-acting
<b>ONSET</b>	2 to 4 hrs	30 to 90 mins	30 mins	15 mins	3 mins
<b>PEAK</b>	4 to 12 hrs	No peak	2 to 3 hrs	30 to 60 mins	30 to 60 mins
<b>DURATION</b>	12 to 18 hrs	18 to 26+ hrs	3 to 6 hrs	2 to 4 hrs	3 to 5 hrs

## Premixed Insulin

Premixed insulin combines bolus and basal insulins in one dose. It helps keep blood sugar under control between and after meals. These are usually used twice daily before breakfast and dinner.



## STOP THE STACKING

Checking your blood sugar levels is a key part of managing your diabetes. If your level is high, you need to correct it with a bolus dose of a rapid-acting insulin. But be careful. You might be tempted to take more insulin if your blood sugar isn't coming down as fast as you would like. **Taking bolus doses within a few hours of each other is called insulin stacking.** Overcorrecting high blood sugar with insulin too often creates stacking. This sets up a vicious cycle that can lead to low and high blood sugar, like a roller coaster. That's because the first dose of insulin is still working when you take the next dose.



## TIPS TO CORRECT THE OVERCORRECTING

- Always check your blood sugar levels before taking a bolus dose.
- Know the onset, peak, and duration times for your rapid-acting insulin.
- Remember that most rapid-acting insulins don't work as fast as you would like them to act.
- Know your insulin to carb ratio. Talk with your provider about what it should be to figure out your correction dose.
- Be patient. Wait 3 to 4 hours before you try to re-correct a high blood sugar level.
- Try other ways to help lower your blood sugar, such as taking a walk or being more active.
- Think about using a continuous glucose monitor, which can give you information about blood sugar trends.



## START THE CONVERSATION

Managing your insulin requires a joint effort between you and your healthcare providers. Here are some questions to ask your provider to get the conversation started.

- ✓ What type of insulin is best for me?
- ✓ Do I need basal insulin? Bolus insulin? Or both?
- ✓ How often should I use insulin?
- ✓ What is my target blood sugar range?
- ✓ What should my insulin to carb ratio be?
- ✓ What insulin correction factor should I use?
- ✓ What should I do if my blood sugar is still high after taking a bolus dose?
- ✓ How long should I wait before taking a second bolus dose of insulin?

**Moving patients from educated to engaged, visit [hormone.org](http://hormone.org) today!**

Editorial review by: Elizabeth Stephens, MD - Providence Portland Medical Center; Ramon E. Martinez, MD - Miami Beach Community Health Center

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FROM THE ENDOCRINE SOCIETY