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## As we reach the end of a long and unprecedented year,

a glimmer of hope has appeared with the first shipment of vaccines. Obviously, none of this happens without the work of industry and clinicians, technology and science. Not much in medicine ever stands still, but it is clear that progress occurs when these forces intersect through research and a common goal of caring for patients.

In this edition, we look at the intersection of technology and medical care at three different aspects of digestive health. Dr. Broyles examines the role technology is playing in altering and improving diabetes management through glucose monitoring that eliminates finger sticks and can also smooth out insulin delivery. Dr. Mandell reports on changes in appendicitis management from a national randomized trial where Swedish and Providence Everett play significant roles in actively recruiting patients. Ms. Nelson begins a multi-part series by introducing our Hereditary Cancer Clinic and the high-risk GI cancer clinic and how such a clinic helps guide the care of patients who have a hereditary cancer. Last but not least, our clinics have increased our use of Twistle to help patients prepare for their upcoming endoscopy procedures. While it reminds you like the dentist office of your appointment, it's more of a companion to help patients remember all the steps necessary to preparing and undergoing endoscopy.

We wish you all a safe and enjoyable holiday season.

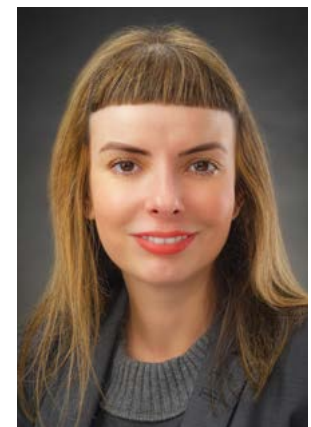
Brian Louie, Jack Brandabur and Klesta Gjini



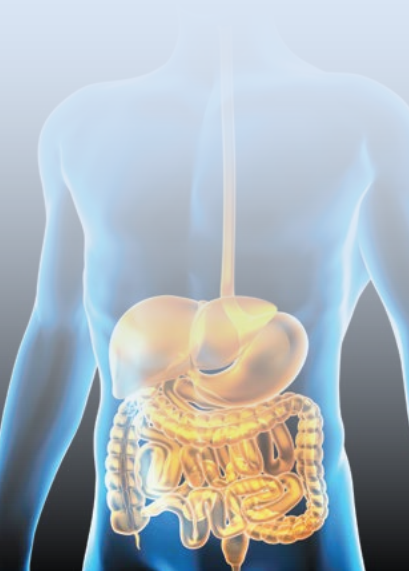
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## A technological revolution in diabetes management

The constant hassle of checking blood sugar levels has long been a hassle for many patients with diabetes. But determining the right dose of insulin is critical for patients to stay healthy, as well as understand what food and lifestyle choices help their body function best.

Fran Broyles, M.D., and her colleagues at the Swedish Diabetes Education Center want every patient to know what new technologies are out there to make life a little easier for those with diabetes.

### Finger-sticks can be a thing of the past



Glucose monitors have allowed patients with diabetes to manage their condition based on real-time information with simple blood tests. Since the first model came out in 1970, patients have been pricking their fingers multiple times a day to monitor their blood sugar. Thanks to new continuous glucose

monitors, like the Freestyle 2 or Dexcom 6, they now have another option.

Continuous glucose monitors work using a subcutaneous catheter that can be placed on the arm or elsewhere depending on personal preference. The devices are thin and allow patients to maintain an active lifestyle while in use, including showering and swimming without removing anything.

The big advantage is that these monitors check blood sugar levels throughout the day, up to once a minute depending on the model, all while the patient goes about their normal activities. Once the device is linked up to a smart phone, patients have all their data at their fingertips, without the pain of manual testing.

And for patients who have trouble remembering to test their blood sugar as often as they should, continuous glucose monitors require action only twice a month, as opposed to multiple times a day.

“The reality is that patients really hate to do finger-sticks,” says Dr. Broyles. “It’s painful and some don’t do

it enough. Having a device that’s painless and easy to wear for up to two weeks is revolutionary.”

By filling the gaps in between the couple of finger-stick tests patients might do on an average day, continuous glucose monitors can reveal dangerous drops in blood sugar that might not otherwise be detected. Patients can configure alarms to alert them when levels are outside normal limits so they know when to take action. According to Dr. Broyles, patients who regularly take insulin might not experience other hypoglycemia symptoms before confusion and unconsciousness sets in, so an early warning can be life-saving.

The more data points available to a patient, the better informed they will be about their body’s response to different foods, exercise, other choices and even stress. In addition to informing how much insulin a patient should take at a given time, the continuous monitoring serves as biofeedback, helping patients anticipate how their actions will affect their blood sugar levels to make better-informed decisions.

Patients can also give their physicians access to the data, giving them a more complete picture of how a patient is doing in between visits, or how well new medications are working. Rather than rely on patient-reported data, physicians and their care teams can review blood sugar levels in real time, and the software can flag concerns to be reviewed.

The monitors can be worn for between seven and 14 days, before scar tissue begins to form around the catheter, at which point patients can move the monitor for another two-week period. While the devices were originally designed to be worn all the time, if insurance or cost is an issue, patients can test drive one for up to two weeks from the Swedish Diabetes Education Center. And while patients using a continuous glucose monitor may still need to inject insulin, another device can address that problem as well.

### Almost like a mechanical pancreas

For patients who are insulin dependent, insulin pumps can give them more freedom from managing their condition, as well as a break from daily injections. While pumps have been around for decades, a new closed loop pumps can connect both aspects of diabetes management: blood sugar testing and insulin therapy.

## A technological revolution in diabetes management (continued)

Like the continuous glucose monitor, insulin pumps also uses a subcutaneous catheter, but in this case to deliver a constant supply of insulin, rather than the patient having to inject it. The majority of insulin pump users have type 1 diabetes, but it can also benefit patients with type 2 who have progressed to requiring insulin.

Two insulin pumps currently available can also connect with a continuous glucose monitor, in what's called a closed-loop pump. The process is not completely automated, as patients still need to input information about their meals, but having the two devices connected is the closest patients can get to a mechanical pancreas for now. "The data show that patients with an insulin pump clearly have better control of blood sugars, especially with these closed-loop pumps," says Dr. Broyles, "and they have significantly less hypoglycemia."

New devices are currently being developed that would also be able to deliver glucagon<sup>1</sup>, the hormone that raises blood sugar as insulin levels fall. With both insulin and glucagon capabilities, a closed-loop pump would be able to better mimic the natural cycle of the two hormones in the body.

While another option is to have a pancreas transplant, patients must take immunosuppressants for the rest of their life and face an increased risk of infection. Clinical trials are currently testing a less invasive version, where only islets the beta cells that produce insulin are transplanted, but that treatment is not yet FDA approved and would also require lifelong medications<sup>2</sup>. While new surgical treatments may be developed in the future, closed-loop pumps are a less invasive and less risky way of effectively controlling blood sugar for many patients right now.

### The Swedish Diabetes Education Center is here to help

Patients who are interested in trying a continuous glucose monitor, insulin pump or the closed-loop pump combination can find out more and get their questions answered by nurses and registered dietitians at the Swedish Diabetes Education Center. When a patient is ready to start using a device, they can receive help with set-up, configuring alarms and other controls and connecting it to a smart phone.

With the right technology, patients can have all the information they need to take control of their diabetes. Dr. Broyles has seen patients struggling to manage their condition turn things around completely after using a new device. "Continuous glucose monitors are an absolute game changer," she says, "and for patients who are insulin dependent, insulin pumps should definitely be considered." ■



Fran Broyles, M.D.

### SERVICES OFFERED BY THE SWEDISH DIABETES EDUCATION CENTER

- 1:1 educational sessions with a Certified Diabetes Care and Education Specialist (in person or virtual)
- Step class series for an overview of managing type 2 diabetes
- Continuous glucose monitor training, either with the patient's device or a sample for two weeks
- Insulin pump training and assessment

<sup>1</sup> Beta Bionics iLet Bionic Pancreas System Gets FDA Breakthrough Designation. Medgadget. <https://www.medgadget.com/2019/12/beta-bionics-ilet-bionic-pancreas-system-gets-fda-breakthrough-designation.html>. Published December 11, 2019.

<sup>2</sup> Pancreatic Islet Transplantation. National Institute of Diabetes and Digestive and Kidney Diseases. <https://www.niddk.nih.gov/health-information/diabetes/overview/insulin-medicines-treatments/pancreatic-islet-transplantation>. Published October 1, 2018.

## To operate or not: new evidence to guide decision making in acute appendicitis



Katherine Mandell, M.D.

Appendectomies have long been the standard treatment for acute cases of appendicitis. Anecdotal evidence and small studies have suggested that a course of antibiotics could also be an effective treatment in some cases, but no large-scale studies have compared the two treatments. Until now.

Katherine Mandell, M.D., an acute care surgeon, and her partners, along with

colleagues in the emergency department at Swedish First Hill and 25 other sites across the country (the CODA Collaborative), have spent several years enrolling patients with appendicitis in a randomized trial to study just that. They published their results in the *New England Journal of Medicine* this October. She is proud to report that more than 1 in 10 of the patients recruited for this trial were at Swedish.

This trial represents a collaboration of physicians, nurses, surgeons, surgery residents and researchers, all working together to better understand how to help patients suffering from appendicitis.

### Anatomy of a trial

In total, 1,552 patients were randomized in the trial and assigned either a 10-day course of antibiotics or an appendectomy. Unlike in previous studies, the goal with patient enrollment was to include anyone presenting with early appendicitis, with only a few exclusions for patients who were pregnant, had a mechanical device implant, spoke a language other than English or Spanish or were too sick to participate.

Each patient was shown a video that described both treatments to standardize the information being conveyed. While the goal was to convey the same information across all the sites, Dr. Mandell also thinks the idea of showing a video could help patients better understand a variety of procedures before they make a decision. "I could see this being used in palliative care discussions, to show patients what it looks like to get a breathing tube, big IV line or what CPR looks like," she says. "Or any number of basic surgeries so the patient can see for themselves what to expect."

Some patients did not wish to have their treatment choice randomized, and those who made their own decision will be included in a separate observational study. In total, over 8,000 patients were screened.

The wide enrollment parameters meant that some patients had appendicoliths, or calcified deposits within their appendix, and others had small perforations. Previous trials have not included these patients because they are thought to be at risk for more complications. This study will provide a closer look at whether their outcomes were different.

### For some, no appendectomy needed

Between the appendectomy and antibiotic groups, there was no significant difference 30 days after treatment. By 90 days, however, three out of 10 who received antibiotics went on to have an appendectomy. That means that 70% of those who only took antibiotics were able to avoid an appendectomy.

For those with appendicoliths, four out of 10 needed an appendectomy by 90 days, confirming the suspicion that those type of cases can be more serious. Outside of patients with appendicolith, the rate of complication was similar between the two groups.

Almost half of those in the antibiotics group were able to go home initially and avoid hospitalization.

On the whole, those patients did end up spending more time hospitalized or in the emergency department but missed less time from work or school with no surgery recovery.

### The decision should depend on the patient

According to Dr. Mandell, the results show that antibiotics may be a good choice for some patients with early appendicitis, though not all. A lot depends on the situation, and the study suggests that informed decisions based on a patient's situation and preferences are important in consideration of therapy. "A lot of it depends on who the patient is and what's happening to them at the moment," she says. "Some people come in and they have a huge exam the next day or they're out of town and don't want surgery away from home."



## To operate or not: new evidence to guide decision making in acute appendicitis (continued)

For physicians, this new evidence can add some flexibility into the treatment decision making process around what the patient wants. Some patients might be afraid of surgery, while others might just want to get it over with. When advising a patient on the two options, physicians should help patients weigh recovering from surgery with the potential side effects of antibiotics. In terms of appendicitis symptoms, those who have surgery will feel better sooner, while those on antibiotics will be able to get back to everyday life quicker without restrictions on how much they can lift.

Understanding that 30% of those who take antibiotics will eventually need surgery should also be a consideration, and for patients with appendicoliths that risk is a little higher.

### Appendicitis in the time of COVID-19

The original aim of the trial was to follow patients for at least a year after they received their treatment for appendicitis. With the COVID-19 pandemic, the medical community has been reconsidering how to manage certain disease processes, including appendicitis. The decision was made by the CODA Collaborative to look at the results early to better inform this discussion and improve care of patients.

For patients concerned about the exposure risk, antibiotics may be a better choice to give them peace of mind, although it's important to note that patients in that group ended up spending more time hospitalized or in

*(continued on page seven)*

## PROFILE: Dr. Martin del Campo

As I reflect on the last several years as a Metabolic and Bariatric Surgeon at Swedish, I am grateful for the experiences that led me here. While I was exposed to bariatric surgery as a general surgery intern, it was not until I became a mid-level surgery resident at The Ohio State University Wexner Medical Center that I realized my affinity for laparoscopy and was drawn to the innovation of other minimally invasive surgery techniques. I remained at Ohio State for a fellowship in Advanced Minimally Invasive and Bariatric Surgery, where I refined my skills in laparoscopic, robotic, and endoscopic surgical techniques of bariatric, foregut, hernia, and general surgeries. As I encountered more patients who had discovered newfound joys in life through weight loss and I saw how the treatment of obesity profoundly impacts overall health and quality of life in a way that few other disease treatments can, I knew bariatric surgery was the direction I would pursue for my career.

Those experiences led me to join Swedish Weight Loss Services with its multi-disciplinary approach to treating patients with the disease of obesity. In addition to my board certification in General Surgery, I obtained a board certification in Obesity Medicine to further gain insight into the disease pathology and the various

modalities of treatment.

My care philosophy always begins by meeting my patients where they are and trying to get a better understanding of what their true goals are, be it to reduce their diabetes medications, to discontinue their need for a CPAP device, to be more active with their children, or to re-engage in hobbies and activities that they have held back from due to excess weight. I enjoy the life-long relationships developed with my patients and find immense reward in being a part of their journey to improve their overall health and quality of life.

While I grew up in a number of states from California to Illinois and with family throughout, I am excited to call the Pacific Northwest and Washington my home. In my few years here, I have had opportunities to backpack the Enchantments, paddleboard on the Sound, and embrace the city life of Seattle, with its beauty and ease of access to the outdoors, and I cannot imagine a more enjoyable place to make my home and further develop my career. ■



## Be a cancer detective

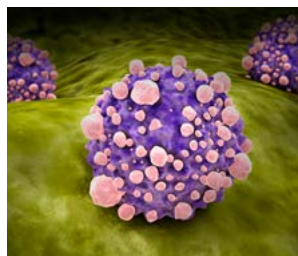
The majority of cancers diagnosed in the US today arise spontaneously, without a link to a known genetic mutation. But for the 5-10% of cancers that arise in patients who have a hereditary cancer syndrome, there can be clues lurking in their family history.

While oncologist and cancer surgeons are on the lookout for hereditary cancer syndromes in cancer patients, primary physicians can be the key to catching those patients with a suspicious family history before they develop cancer, or at an early state before symptoms are noticeable.

According to Brianna Nelson, a genetic counselor, that can include having a relative who had cancer under the age of 50, particularly colon, breast, uterine, or prostate cancer, or having three or more relatives diagnosed with the same cancer. Some cancers are uncommon and more likely to be related to hereditary cause, like ovarian cancer, pheochromocytomas (adrenal gland tumor), and to some degree pancreatic cancer. With those cancers, one family member is enough for a patient to consider genetic testing.

An easy way for physicians to flag patients with a family history is to make those questions part of the initial or annual questionnaire. And for those patients who are interested in finding out more about genetic testing, a referral to the Hereditary Cancer Clinic is the next step.

### Cancer lurking within genes



At the Hereditary Cancer Clinic, patients meet with board certified genetic counselors, like Brianna, meet with patients to review their family history and discuss whether genetic testing is right for them.

If tests come back positive, that information can help patients understand if they should start cancer screenings like colonoscopies earlier than typically recommended, and if there are additional screenings they need like an upper endoscopy or gynecologic screenings.

While genetic testing of the past could cost thousands of dollars, in Brianna's experience, panels testing more than 30 types of cancer-causing genes are now more affordable and often covered by insurance depending

on their criteria. Tests can use either blood or saliva, but during the COVID-19 pandemic, when patients might be more reluctant to visit the hospital for non-urgent care, they can use kits to collect their own saliva at home.

Many of the hereditary cancer syndromes can predispose patients for multiple types of cancer, though it doesn't guarantee patients will get cancer during their lifetime. A diagnosis of a genetic condition can also be useful information for a patient's family, so that other family members, like siblings, cousins or children can make their own choice about getting tested.

Along with the well-known BRCA mutations that effect a patient's risk of breast, ovarian, prostate and pancreatic cancer, there are also genetic syndromes that increase risk for colorectal and other digestive tract cancers. That includes Lynch syndrome, which affects up to 1 in 279. Patients with a Lynch syndrome diagnosis can face a 20 to 80%<sup>1</sup> increased risk of colon and other types of cancer, depending on their particular mutation. Other more rare syndromes include familial polyposis, hereditary diffuse gastric cancer syndrome, Peutz-Jeghers syndrome, and multiple endocrine neoplasia syndrome, all of which increase the risk for multiple cancers.

One of the most difficult parts of these hereditary cancer syndromes is that patients are at risk of developing cancer at an earlier age, before typical guidelines recommend screening. Although genetic conditions only contribute to a minority of cancer cases, catching those with a family history is critical for patients to get on the right screening schedule.

Most patients will only start having colonoscopies at age 50, where family history of GI cancers are discussed. But for some, that is too late. And since patients with colon cancer might not notice symptoms until later stages of the disease, a family history might be the only red flag before the cancer becomes more advanced.

### Screening for a healthy future

Once patients have been diagnosed with a genetic condition that predisposes them to gastrointestinal cancers, the High-Risk GI Cancer Screening Clinic is there to help patients navigate their condition. Gastroenterologist Kunjali Padhya, M.D., and her colleagues manage the many kinds of screenings required for patients with a genetic condition and advise

## Be a cancer detective (continued)

### CONSIDER A REFERRAL TO GENETICS FOR A PATIENT WITH...

- A personal or family history of an adult onset cancer (breast, colon, uterine, prostate, pancreatic) under the age of 50.
- Three or more relatives diagnosed with the same cancer.
- A personal or family history of multiple primary cancers in one person, either the same type of cancer or difference ones.
- More than one childhood cancer in a family, like childhood sarcoma or leukemia.
- A personal or family history of male breast cancer, triple negative breast cancer, ovarian cancer, metastatic or aggressive prostate cancer, or pheochromocytomas/ paragangliomas.
- A personal or family history of more than ten pre-cancerous (adenomatous) colon polyps.
- A known cancer syndrome or cancer-causing gene mutation in the family.
- Ashkenazi Jewish ancestry.

on any preventative actions that can reduce the risk of cancer at an annual check-in.

Screenings can include an annual colonoscopy, upper endoscopies and urine samples as well as referrals for dermatologists, gynecologists and other specialists. With Lynch syndrome, it may be recommended for

women to have a preventative hysterectomy at age 40 or after they're done having children. And for Peutz-Jeghers syndrome, which can include an increased risk of breast cancer along with polyps in the digestive tract, patients are referred for mammograms and other preventative exams.

"It's really a clinic without walls," says Brianna. "We have a multidisciplinary team that works closely with genetic counselors to ensure patients receive the right screenings and referrals to manage their condition."

Once a genetic cancer syndrome is identified, not only are patients getting the screening they need to stay on top of their health, but they are also building long-term relationships with specialists who understand the ins and outs of their condition. And that all starts with primary physicians, who have the opportunity to identify which patients might be at risk. ■



Brianna Nelson

<sup>1</sup> Lynch syndrome. MedlinePlus. <https://medlineplus.gov/genetics/condition/lynch-syndrome/>. Published August 31, 2020.

## New evidence to guide decision making in acute appendicitis (continued)

the emergency department that those who had surgery. And for health care systems dealing with a rising number of positive cases, antibiotics may be a better choice for patients who are also fighting a COVID-19 infection, to avoid compounding risks of surgery and breathing difficulties.

### What's next?

The research group continues to follow their patients and plans to report back on long-term outcomes of patients with both treatment options. There are also several additional studies linked to this population using the data collected. The collaborative would

also like to better understand the risk of developing appendicitis at a later date for the patients who receive antibiotics. Another risk for patients who do not have surgery is the chance that cancer of the appendix may be present and would not be detected without a surgery. The researchers estimate this risk is 1 in 200, and they would like to better understand the impact of a delayed diagnoses on a patient.

For Dr. Mandell, the take home message is one of informed patient choices. "Patients can use this information to talk with their doctors about the treatment that is right for them," she says. ■

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## Twistle: caring for patients, one text at a time

Preparing for a colonoscopy should not be rocket science, but patients used to have to calculate when each step of the process should start, from T-8 days down to the procedure date. Flipping through pages of instructions could be confusing, and if the right steps weren't taken, not only would the patient not have a needed procedure, but the clinic could not fill their space on short notice.

For the past four years, SDHI has been using Twistle to guide a limited number of patients through each step of the colonoscopy process with real-time messages. Given the success with this small group, SDHI is going to increase its utilization of Twistle to guide nearly all patients undergoing colonoscopy, as well as Bravo pH monitoring, ERCP and abdominal surgeries. As time goes on, more procedures will be added, as well as the option to receive messages in languages other than English.

All patients need to provide is a cell phone number, and timely information such as when to stop eating and drinking, instructions for other preparations or frequently

asked questions arrive via text message. While it takes time to set up the timing and content tailored to each procedure, once the pathway is set the messages deploy automatically based on the procedure date. Patients can also confirm their appointments, and after surgical procedures they can complete surveys about pain levels, mobility and other measures of recovery.

While the system is automated, it helps to reassure patients that they are prepared for their procedure. And the system has been especially useful for procedures scheduled months in advance, like colonoscopy, to reopen communication with patients and ensure they have all the information they need to avoid a cancellation. ■

**“The messages gave me the confidence to know that I was doing everything exactly as I needed to do. I felt like I had someone holding my hand through the whole process.” – SDHI patient**