“That’s Understandable” Season 2 - Episode 3
“The Smartest Pill You’ll Ever Swallow” Transcript
lp05 06052024

Brendan (00:11)
Hello everyone, and welcome to That's Understandable. I'm your host, Brendan McEvoy, US head of external communications at AstraZeneca. If this podcast has been enjoyable and informative for you, take a moment to like and follow on your favorite streaming service. And if you know anyone else interested in today's topic, be sure to share, because our goal is to help everyone to better understand what science can do when we all work together.

It's a common theme in children's education shows. The main character is learning about the digestive system when they suddenly shrink down small enough to investigate inside the body. During their trip, they discover a blockage in the esophagus, or learn about a condition in the small intestine, gaining a new, deeper understanding of the inner workings of the human body before exiting and sharing what they've learned with the audience. Sounds far -fetched, right? But with advances in technology, this fantastic journey is actually very real. No, I'm not talking about shrinking doctors, but thanks to ingestible cameras, healthcare providers can now view the inner workings of the human body without an invasive procedure through the use of what is known as SmartPills.

“Smart pills” are a class of digital health tools that travel through the gastrointestinal – or GI tract – to help healthcare providers in diagnosis, treatment and even surgery, providing real-time detailed information on a patient's GI tract health. That's a lot to digest but, fortunately, here to help is our guest, Dr. Peyton Berookim, a gastroenterologist with the Gastroenterology Clinic of Southern California with nearly 20 years of experience in diagnosing and treating conditions of the GI tract and liver. Welcome to That's Understandable, Dr. Berookim!

Dr. Berookim (02:15)
Thank you for having me.

Brendan (02:18)
Absolutely. So we've got quite the topic to talk about. So I'm not going to waste any time in jumping in. I shared in the upfront there that the title of today's episode is the smartest pill you'll ever swallow. And it comes from something you said in an earlier conversation we had making. Let me start that over. So the title of today's episode is the smartest pill you'll ever swallow. And it comes from something you said in an earlier conversation we had making you the perfect person to ask what makes these pills so smart.

And how do they even work?

Dr. Berookim (02:38)
These smart pill capsules are truly the smartest pill you'll ever swallow. There are various capsules designed for examining the different aspects of the gastrointestinal tract. We have one capsule that's designed for the esophagus and the stomach. There's another capsule for the small intestine, and we have a different one for the large intestine, also known as the colon.

And depending on which capsule we use, the recording times vary anywhere from 30 minutes to eight hours, depending on which capsule they're swallowing, the esophagus being the shortest and the colon being the longest study. So typically patients would come to the office first thing in the morning. We have them wear a recording device. They swallow one of these pills.

Dr. Berookim (03:43)
They leave the office, they come back about eight hours later, and they give back the recording device to us that needs to be downloaded. And as these capsules traverse through the small bowel, they're taking multiple images per second. So after the eight hour period, there's approximately 15,000 pictures or so for me to review in hopes of maybe answering some of the medical questions we're looking for.

The good news is these are one -time capsules, so they do not have to be retrieved. They pass naturally and get flushed away. Now, over the years, with the advancement of technology, the smart pills have become even smarter. So think about the smartphone you had 15 years ago. Now think about the smartphone that you have today, how everything is better, smaller, faster.

It's a completely different device. Similarly, the pictures of the smart pills have become sharper, clearer. They have improved the camera angles. So they're now a little wider, allowing more surface area visualization and decreasing the chance of possibly missing something. And the software has become more advanced. So as I mentioned, the capsule, is traveling through the small bowel, it's taking multiple pictures per second. So if it gets delayed in an area, there's going to be a lot of repetitive photos. But now the software is able to remove those repetitive photos, shortening the video. So when we go to review it, it's more of a condensed, more efficient study to read. They've been great before and have become even better.

Brendan (05:27)
Awesome. Thanks. Thanks for that explanation and kind of setting us up. I know where it's an audio only podcast, but can you give us a sense of the size? So like, you know, in comparison to maybe pills that were familiar with taking, how would you describe sort of the size of the different pills?

Dr. Berookim (05:46)
So they're all similar in size. They're approximately the size of a multivitamin, maybe about an inch in height and a little narrower in width. They're round, they're smooth, they're very easy to swallow. So we haven't had any issues.

Brendan (06:07)
So in your practice, how often are you using something like this?

Dr. Berookim (06:12)
Well, I've been using this technology in my practice for over 15 years and I actually use it frequently. For example, our traditional upper endoscopy can only see approximately the first six inches of the small bowel and a traditional colonoscopy can evaluate the last six inches of the small bowel. But the small bowel is about 21 feet in length. So the...

SmartBow Pill is the perfect tool to evaluate the remaining 20 feet as a possible site of blood loss or whatever we're looking for. Also, at times patients may not be a good candidate for sedation where anesthesia may be a risk. And for these patients, the PillCam again would be a great alternative. Many patients...

happen to be on blood thinners. And when undergoing the traditional upper endoscopy or colonoscopy, these medications need to be discontinued because of the potential increased in bleeding. And these patients are on these medications because they may have had a prior history of blood clots or they may have any regular heartbeat and stopping them can put them at risk of developing a new clot. And again, the pill cam would be a good choice for patients in that situation.

Dr. Berookim (7:46)
And what sort of reactions do you get from a patient when you tell them that they're going to swallow a camera, if you will? Are they apprehensive? Or what's the typical reaction?

Dr. Berookim (08:00)
So when I explain the procedure to them, I usually show them a sample. It's a pretty jaw drop in reaction. It's very futuristic. They're very excited. And at the same time, they're also very relieved when I let them know that the capsule doesn't have to be retrieved. But patients are always willing to do it. And they're excited to do it.

Brendan (08:29)
Yeah. And I guess, you shared just a few minutes ago some of the benefits in using this smart pill over some other diagnostic tools in terms of being able to obviously get more, capture more information than traditional tools, if you will. But are there any drawbacks or concerns in using this type of technology in comparison to others?

Dr. Berookim (09:01)
I think the main drawback is that the capsule cannot obtain any biopsy since this is a video recording. There's also a higher chance of the camera missing a potential pathology over your traditional procedures. When you're doing an endoscopy, you can bring the scope back and forth, change the angle. This is a video, so if the capsule passes an area, there's no way of, you know rewinding the capsule to re-examine an area that it missed. It's also important to know that these smart pills should not be used in anyone suspecting any narrowing or stricturing of their digestive tract because the camera can get stuck. These capsules do contain batteries. So if they do get stuck, they do have to be removed non -surgically.

Brendan (09:58)
~~T~~his might not be super relevant, but in that scenario, if you sort of see something or like, capture something, but you're not quite sure, would the next step be to do a more traditional endoscopy or would it be to, like, would you have the patient swallow another, um, smart pill?

Dr. Berookim (10:23)
Good question. So if we identify something on the smart pill, if it's in the esophagus, you do your traditional endoscopy. If it's the colon, they do the traditional colonoscopy. It's the small bowel that's a little trickier. So depending on if it's in the upper half of the small bowel or the lower half, there is a procedure called the double balloon. So it's a different technique.

Dr. Berookim (10:45)
It takes several hours to do. It's not as simple as an endoscopy or colonoscopy. So we go either from up top and try to reach that lesion and then try to take a biopsy to see if it's malignant. And if so, then we schedule patients for surgery to have that area resected. So either going from up top with a double balloon or doing a retrograde double balloon from below, you can try to reach where that pathology is and then confirm if it's something that needs to be removed or not.

Brendan (11:31)
Is there any limitations on the frequency in which a patient could, I'm thinking like is this something that a patient could swallow a smart pill on a yearly basis as a diet tool or is there any sort of limitations in the frequency I guess is what I'm getting at.

Dr. Berookim (11:48)

We do run into patients with obscure GI bleeding and we do an upper endoscopy, we do a colonoscopy, we can't find anything. We do a capsule, we can't find anything. And unfortunately, sometimes these patients go through numerous procedures, including numerous capsules to figure out where the source is because sometimes if you're not doing the capsule at the time of the bleeding, you're gonna miss it because a lot of times these are lesions that bleed temporarily and then they stop. So when we go in there, we don't see it. And then they resurface, they bleed, and then patients end up in the emergency room again. And we do endoscopy, colonoscopy, it's normal, do another capsule. So I've seen patients go through several rounds of these. And sometimes we still can't find the source, believe it or not.

Brendan (12:42)
TRANSITION 1
It was interesting to hear the advantages and limitations this technology presented in a practice like Dr. Berookim's. He mentioned there were benefits to the patient and provider, and I wanted to know specifically how this technology helped patients.

One of the things, as you were talking about benefits earlier, I had, when we were chatting in sort of the pre, you know, pre -meeting, if you will, to this, I believe you were also talking about some benefits from a medication adherence or maybe the ability to determine. Could you just shed a little bit more light on that benefit?

Dr. Berookim (13:22)
Sure. So the smart pill plays an important role in like monitoring patients response to therapy. For example, I've diagnosed numerous patients with Crohn's disease or inflammatory bowel disease by using this camera. They swallowed the camera, you know, their upper endoscopy or colonoscopy may have been normal. We're suspecting something's going on in the small bowel where they swallow the video camera and the camera identifies ulcers in the lining of the small bowel, and it gives us our diagnosis of Crohn's disease. We then start patients on the appropriate medications. Many times they're doing well. Sometimes patients may still clinically have symptoms, and we have them repeat the capsule maybe six, seven months later to go back and review and see.

You know, confirm if the ulcers have resolved, have they improved? So it lets us know if the therapy is working. So we don't just rely on their symptoms, but we also confirm mucosal healing, which is very important.

Brendan (14:34)
Okay. And one of the questions that oftentimes with any sort of healthcare procedure or anything like that is obviously maybe is the topic of cost, right? So is there any sort of significant differentiator putting aside the potential better benefit of or the more information captured? Is there, in terms of a patient perspective, and I know it varies based on you know, insurance and coverage and things like that. But is there a significant difference in cost for the, in using a smart pill versus a more traditional or sort of less intelligent diagnostic tool?

Dr. Berookim (15:21)
Well, the standard endoscopies are very intelligent, you know, but when we do endoscopies and colonoscopies, you got to keep in mind these are not done in the office, they're done at a surgery center. So that has the cost of the surgery center, cost of anesthesia. So it can actually be more expensive if you consider all that, but the patients have to be aware, sometimes the insurance doesn't cover these capsules, they may have to pay out of pocket. And then keep in mind, if they do a capsule, again, it's a video. So if it identifies something, then they need to go and do the traditional endoscopy to maybe take a biopsy to sample it to see, is it cancer? So

they may end up having to do both procedures, but there's definitely an important role where these capsules play a role for patients, not for everyone.

Brendan (16:18)
Okay. And, and, you know, I was thinking to put it in sort of practical terms and actually what you just shared there, cause I wasn't thinking about sort of a having to go to a surgical center for, um, you know, traditional diagnostic procedure versus using the smart pill. So if we, if we think about in comparisons to maybe the traditional colonoscopy versus something like this, do you, I know oftentimes the … A lot of people say the hardest part of a colonoscopy is the prep work and things like that. Would a patient still undergo some sort of prep work prior to using the smart pill?

Dr. Berookim (16:55)
Great question. Absolutely. So yeah, the colon has to be super clean so we can see. Because this is a video, the colon cleanse is actually a little bit more aggressive because we need to make sure that it is clean as a whistle. During a colonoscopy, we're able to flush and wash and rinse where we can't do that with this.

I mean, I want to be clear, the colonoscopy is still the gold standard for colorectal cancer screening. But for patients who are maybe apprehensive of having the procedure done for whatever reason, whether it's the stigma of it, whether they don't want to be sedated, the colon pill would be a viable option. But the colonoscopy is the gold standard. And yes, patients… have to steal fast and get cleaned out like a typical colonoscopy.

Brendan (17:59)
And this might be a silly question, but how did, you know, you talked about sort of the, obviously the different types of pills based on, you know, where they're trying to, you know, sort of capture information from. Is it, and this is where my, you know, lack of knowledge in the human body is, is it the pill, I guess, essentially, regardless of the pill, it follows the same track, if you will, through the body and the longevity of the pill and it's, is how it, the amount of information it's able to capture, right? It's not that like the pill is finding its way to, you know, a specific part of the body. Is that, is that accurate?

Dr. Berookim (18:41)
So you're right, the pill has to go through the same track. They swallow it. It goes down the esophagus. If we're looking for pathology in the esophagus, those pills have two cameras, one on each end. So you're getting more pictures because it's a shorter track. We need those images. And they pass through the stomach. And usually that's what we're looking for. The technology is different with each pill.

The small bowel pill is really designed for looking at information in the small intestine. So obviously in order to get to the small intestine, it has to pass the esophagus and the stomach. So we do get images, but not to the detailed extent that an esophageal pill would give us. And then the colon pill is a little different. The battery life has to be longer because it has to reach the colon and then you have to you know, it has to be viable enough to get excreted. That sometimes patients have to take certain medications to help push the capsule further down to speed up the transit time. So it doesn't give you great pictures for the small bowel. So every capsule does go down the same track, but they're functioned a little bit differently how to obtain that data and provide us better data.

Brendan (20:08)
Okay, and is there certain, you hit on it a bit, but are there certain patient populations where this maybe isn't preferred or maybe is preferred over traditional measures?

Dr. Berookim (20:31)
Uh, yeah, I guess there are certain cultures that the stigma of doing a colonoscopy are greater, but I think over the years, the education, um, showing the importance of undergoing a screening colonoscopy, I think the message is finally getting through where, uh, everybody understands that it's an important screening. And I like to point out, because I get this asked often, sometimes my female patients ask me, the woman needs to do a colonoscopy. And the answer is absolutely yes. If you have a colon, you are at risk of developing colon cancer. I think it's the idea of because the camera's going through the rectum and they think rectum prostate exam, so patients get confused. But every… male and female over the age of 45 should undergo some sort of screening for colorectal cancer.

Brendan (21:37)
TRANSITION 2
Listening to Dr. Berookim's answers, I could tell how important it is for him to give patients an alternative to more intrusive techniques and just how valuable smart pills are to his practice. With that in mind, I wanted to see how he thought this technology could continue to improve. Thanks for that clarification. There was a study by the University of California that showed an AI algorithm could predict an inflammatory bowel disease development in 86 % of cases using data from smart pills. Do you think AI and smart pill data could be used to proactively screen for other conditions?

Dr. Berookim (22:17)
Absolutely. One or more common uses of the smart pill is actually for the diagnosis and monitoring inflammatory bowel disease. As I mentioned earlier, the software is getting smarter. So currently when the capsule goes through the software may mark off certain pictures that it thinks it's abnormal. And we do get a lot of false reads, false negatives.

And I think adding AI can probably better identify any real pathology to market, including colon cancer. So the doctors still have to review it, but if you have another AI eye to say, you know, for better just reviewing this. So after we read the study, we go back and see if there's something they suggest. And I think that's in the works. So, You know, the colon pill right now is in the market and can be used for colon cancer screening. And the purpose of the colon pill is to identify the presence or absence of polyps. Polyps are normal growths that typically turn into cancer. So this is a way of identifying if there are polyps present. Again, this is just a video. So if a polyp… is identified, the patient will need to undergo a traditional colonoscopy to have it reviewed. But absolutely, these smart pills are always used for inflammatory bowel disease. They're available for colon cancer screening and other things as well.

Brendan (24:06)
And we're talking a lot about the sort of in the diagnosis as a diagnosis or diagnostic tool. Are there are there applications in actually treating GI disorders as well?

Dr. Berookim (24:21)
So you mean when we're looking for, I mean, a lot of patients, they may have unexplained blood loss from their digestive tract, right? So they undergo maybe a traditional upper endoscopy and a colonoscopy. And we don't see anything. And then the small pal, the smart pills can help us in identifying maybe the cause of the various medical issues. I've had numerous patients with unexplained blood loss and these capsules identified maybe cancers of the small bowel, ulcers in the stomach, ulcers in the small bowel. A really interesting story. Several years ago, I had a 90 plus year old patient. She was brought to my office by her daughter. She wasn't really eating like she used to. She's had significant weight loss. The daughter was concerned something's going on.

Her doctors just told her, you know, your mom's old or older. So obviously she's not going to eat as much as she normally would. So, you know, I talked to this patient, she was previously healthy. So it didn't make any sense to me that this is an age related issue. I asked the patient if she has pain with swallowing and she said yes. So that let me know that there's some sort of problem with the esophagus.

I scheduled her, had her swallow one of the esophageal pills and it showed that she had candida or fungus throughout her entire esophagus. I treated her with a short course of anti -fungals, her discomfort resolved. She started eating again, gained most of her weight back and everything was back to normal. This is a patient that I would be risky for me to sedate in the office. So this technology allowed me to come up with the right diagnosis and it was so gratifying to see her do well. And I'm still receiving holiday cards from her daughter, so that's nice.

Brendan (26:32)
Yeah, that's very cool. Yeah, you know, we talked about, you know, some of the different, you know, potential conditions that the smart pill can help, you know, identify or help diagnose. And we, you know, you shared about sort of the colonoscopies and sort of the recommended guidelines of, I believe you said over 45. You know, we obviously are always trying to bring useful information.

In addition to, of course, informing people about smart pills and how that technology is sort of unlocking additional insights. Are there other sort of useful information or like screening tips that you would suggest or like what would be the most common or regular reason why a patient may come in for some sort of screening or diagnosis beyond, I guess I'd say, beyond sort of a colonoscopy?

Dr. Berookim (27:30)
So in my field, the most common indication of screening is colon cancer screening. So it used to be 50 years of age, now it's 45. We don't know why there has been an increased risk of, or I should say increased incidence of colorectal cancer in people aged 45 to 50. So for that reason, they've lowered the...

guideline to 45. Fortunately, I don't diagnose myself too many young patients with colon cancer, but I do hear about a lot of cases where a patient may come to my office and say, you know, my colleague, my boss, my cousin, my best friend just got diagnosed with stage four colon cancer and sometimes they're under the age of 40. So it's very frightening. So.

We, the society, we encourage everyone to get screened and I think we're doing a better job of doing that. And then I also try to see patients have like a family history of other cancers that may warrant having them do a genetic testing, you know, to see if they're a carrier for any particular cancers. So that's important. We do a lot of upper endoscopies for different reasons, patients with chronic heartburn are at risk of developing esophageal cancer. So if they've had heartburn for 15 plus years, having an upper endoscopy is important to screen for esophageal cancer. Patients obviously have symptoms of unexplained abdominal pain, trouble swallowing. We do an endoscopy to make sure it's not cancer or something that can be treated. So we have a lot of ways of diagnosing things and, you know, these smart pills just add to our arsenal.

Brendan (29:36)
And when you think about your practice in this space, maybe prior to the smart pill being introduced to now to maybe even what you envision for the future, tell me a little bit about like

how, as you've, as you evolve from sort of pre -smart pills to now, like what has changed for you or like, as you think about, what sort of new information, new insights have are unlocked that you think might even be taken to the next level as this technology evolves even further.

Dr. Berookim (30:11)
So I was introduced to the SmartPill during my training. So ever since I've been in practice, it's been available. But I know before the SmartPill, for example, to evaluate the small intestines, patients would have had to undergone surgery. So now we're eliminating unnecessary surgeries by having them swallow a video camera. But medicine is evolving. You know, we're learning more about different disease entities and how to, you know, whether it's a blood test, genetic testing, to figure out where the problem would be and allow us to kind of focus on that screening to rule in or rule out a specific illness.

Brendan (31:02)
So before we wrap up our conversation, I just want to go back and again give you the opportunity, if there's anything that you think would be helpful, anything that we missed during this conversation around the smart pill or anything like that, I just want to make sure that you have the opportunity to share it with the audience.

Dr. Berookim (31:19)
Yeah, I just, I think patients should be well educated with what's going on. It's important to rely on your physicians, but I think patients need to be their own advocate and know about what's available in different fields. So sometimes you have to get a second opinion.

If your guts telling you something is wrong and that you're told everything is normal, you have to get a second opinion and see are there other technologies, methods of identifying if something is going on. So I think with the internet today, there's information available to everybody at our fingertips. So it allows us more than ever to self -educate and know what the next step may be.

Brendan (32:16)
Yeah, that's a great reminder about the importance of being your own advocate, seeking information. I think you're right. Some patients might be hesitant to seek multiple opinions, or obviously, sometimes even there's a fear or discomfort in even seeking one opinion. So it's a great reminder to really be your advocate, seek the information you need, get the questions that you have answered. What about, I guess sort of my final question would be, I'm sure that you have peers out there that maybe haven't, peer physicians out there who haven't incorporated smart pills into their practice, maybe have some apprehensions. Is there anything you'd say to them that from your perspective, if they haven't, that maybe they should, any reasons why, or advice or thoughts on why they should consider incorporating smart pills into their practice?

Dr. Berookim (33:16)
I mean, I personally think it's important for every physician to be up to date with the latest and greatest technology in whatever field they specialize in. The smart pills are an absolute necessity for any GI practice. And I think physicians who are not trained to perform or read these studies, they should at least refer their patients to a facility that does perform this, who's comfortable with doing this.

You know, my nine year old patient that I just mentioned, if I didn't have this tool, she'd be at high risk for doing an endoscopy. I mean, I don't know what I would do, but I was able to diagnose her in my office without having to sedate her, taking her to a surgery center. So I think it's necessary, you know,

I'll give you another perfect example why GI offices should incorporate this technology. A few years back, I had a gentleman who came to my office for a colon capsule study rather than doing the traditional colonoscopy. And, you know, with every patient, I explained the pros and cons of every procedure. I reminded him, hey, you know, the colonoscopy is still the gold standard. And that's what I recommend.

Well, this patient happened to be a former IV drug user. You know, he'd been clean for over 30 years and he was afraid of getting any form of narcotic medication, you know, for sedation, fearing it may trigger his former addiction. So he had a valid point and we proceeded with the smart bill and thankfully it was normal. So he didn't have to undergo the traditional colonoscopy. Again, I think these smart pills are an important arsenal for any GI practice. And if someone's not familiar with it, it's never too late to educate yourself. And if there's any apprehension, know that they're available and refer them to a colleague who has these technologies available for their patients.

Brendan (35:40)
Just to put a sort of a fine point in that, what it sounds like to me is this is a very patient -centric, right? In that you are, it's an option for patients, like you said, and the two examples you gave, a patient who sedation may have been too much for at her age, or a patient to your point that is, was a recovering addict and making sure that doesn't trigger any narcotics involved in traditional colonoscopy would trigger. So I think that's a great point there, that this is giving, as you said, an arsenal. It's giving more options to physicians to help the variety of patients that they may experience on any given day.

Dr. Berookim (36:11)
Yeah, we're just here to, you know, offer help. So, whatever extra tools we've got makes our job easier.

Brendan (36:20)
Yeah, fantastic. Well, Dr. Berookim, thank you so much for your time. This has been really insightful to learn about SmartPills, this technology, how it's being used. So again, thank you. I know this will, it's helpful to me, informative, so I'm sure it will be helpful and informative to our audience as well.

Dr. Berookim (36:39)
My pleasure.

Brendan (36:41)
The potential of these devices seems incredible and it can be a lot for us to take in. I'm grateful for experts like you and others who can share their experience and expertise to help us break down barriers to our understanding of technologies like this one and equip us to be more active participants in our own healthcare journeys. You certainly helped us learn more about the benefits and made us a little smarter about SmartVilles. Thanks again for joining us on That's Understandable. For more information about today's episode, be sure to check the show notes. Until next time, be well, be healthy, be understanding.

ADD TO TRANSCRIPT
TRIGGER WARNING
NONE

INTRO RE-RECORD

1:40 - 2:15
“Smart pills” are a class of digital health tools that travel through the gastrointestinal – or GI tract – to help healthcare providers in diagnosis, treatment and even surgery, providing real-time detailed information on a patient's GI tract health. That's a lot to digest but, fortunately, here to help is our guest, Dr. Peyton Berookim, a gastroenterologist with the Gastroenterology Clinic of Southern California with nearly 20 years of experience in diagnosing and treating conditions of the GI tract and liver. Welcome to That's Understandable, Dr. Berookim!

TRANSITION 1 @~12:42
It was interesting to hear the advantages and limitations this technology presented in a practice like Dr. Berookim’s. He mentioned there were benefits to the patient and provider, and I wanted to know specifically how this technology helped patients.

Re-Record at 35:09
Thank you, Dr. Berookim. To put a sort of fine point on this episode, I can tell how beneficial this “smart pill” technology is not just to a healthcare provider like yourself, but to patients, as well. From those who can’t undergo anesthesia for health or personal reasons, to those who are nervous about more
traditional methods, these “smart pills” give you another tool that can achieve the scientific and medical process you need while keeping patients at ease and, ultimately, as healthy as possible.