



# New and Emerging Digital Health Technologies for the Treatment and Management of Functional Gastrointestinal Disorders

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*Dr. Almario is the recipient of the 2020 IFFGD Research Award for Clinical Science Investigator. Dr. Almario's research is focused on developing and validating innovative, scalable, evidence-based technologies that support patients and clinicians in making shared decisions that improve health and reduce costs. In addition, he is interested in furthering our understanding of the epidemiology and impact of GI symptoms and FGIDs in the U.S.*

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Learn more about this topic by viewing the video program *Exploring Gut Topics: Choosing Apps for Managing Chronic GI Illness* on IFFGD's YouTube channel.

In the last couple of decades, there have been amazing technological advances in gastroenterology. These include advances in endoscopic procedures, innovative therapeutics such as biologic medicines, and an improved understanding of the gut microbiome, among many others. The microbiome includes all the bacteria and microorganisms that live in the intestines. This is necessary for healthy digestion. While these advancements have been exciting, the way we deliver care is largely unchanged. Today's health care centers around a 15-to-30-minute clinic visit spaced out every few months. Having so few meetings between patients and healthcare providers can make it difficult for ideal communication. Regular communication helps to exchange information efficiently and effectively, to help improve treatment and illness outcomes. This is especially true for those with chronic conditions such as functional gastrointestinal disorders (FGIDs). FGID's include irritable bowel syndrome (IBS), dyspepsia, and chronic constipation. On average, 4 in 10 people are affected by FGIDs.

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## Mobile Apps for Digestive Health

Because these conditions can be difficult to treat, it is important to come up with new ways to enhance the interaction between patients and healthcare providers as well as to develop new and unique treatments. This is where digital health innovations have the potential to change—and hopefully improve—the care that is provided. New technology can tap into the lives of patients when they are outside of the clinic. As of 2019, 81% of Americans have a smartphone. As a result, there has been an explosion in the number of mobile health apps. These apps can have several purposes such as education and allowing users to record their symptoms. Some apps also allow for patients and their healthcare providers to easily communicate with each other.

- **MyGiHealth®** - To support people with FGIDs and chronic gastrointestinal (GI) symptoms, our research groups at Cedars-Sinai Medical Center and the University of Michigan developed an app called MyGiHealth®. It allows users to track their GI symptoms and quality of life. This app also provides personalized education and information about treatments for common FGIDs. The app also has a GI symptom history survey that creates a report based on your responses. This report summarizes a patient's symptoms and makes it easy to share the information with a healthcare provider. Consider this report to be like the

questionnaires that are sometimes given before

**The Food and Drug Administration (FDA)** is one of the U.S. government's regulatory agencies. This agency oversees a broad range of topics that pertain to food, drugs and other products used daily.

The FDA works to protect public health by assuring that foods and drugs for humans and animals are safe and properly labeled. The FDA also ensures that vaccines, other biological products, and medical devices intended for human use are safe and effective.

visits.

One study found that reviewers deemed MyGiHealth<sup>®</sup>'s histories to be of higher overall quality compared to those written by healthcare providers.

- **GIThrive<sup>®</sup>** - Another example of a digital platform designed for those with chronic GI conditions is GIThrive<sup>®</sup>. This is an employer-sponsored digestive health program by Vivante Health. The platform has several features including GI symptom and mental health monitoring, behavioral therapy, and one-on-one sessions with dietitians and health coaches. Ultimately, the goal of GIThrive<sup>®</sup> is to improve digestive disease outcomes while at the same time reducing healthcare costs.

## Digital Therapies

Aside from smartphone-based symptom trackers, there has been an increase in the availability of digital therapies for patients with FGIDs. To support those with IBS, Zemedy<sup>®</sup> by Bold Health and Parallel<sup>™</sup> by Mahana Therapeutics created apps that provide personalized feedback and skills training in cognitive behavioral therapy (CBT)—a form of psychological treatment.

While traditional in-person CBT is effective in treating IBS symptoms, access to it is currently limited to a few, large academic medical centers. By providing structured CBT digitally using smartphone apps, Zemedy<sup>®</sup> and Parallel<sup>™</sup> aim to increase access to this effective therapy on a wide scale. One large randomized controlled trial showed positive results of CBT treatments provided through Parallel<sup>™</sup>. This study found that CBT improved IBS symptoms at the 1-year mark of using Parallel<sup>™</sup> when compared to usual

treatment. It was authorized by the U.S. Food and Drug Administration (FDA) in November 2020.

## Biosensors

There are also many other new technologies that may be helpful for those with FGIDs. One such technology is wearable biosensors. The most well-known wearable biosensors are fitness trackers that monitor step counts, heart rate, and sleep, among other health related measurements. These devices are widely available online and in stores for general use. In addition to easily accessible devices, research has been done to improve biosensor use in patient care.

There are now devices in development that passively monitor the GI system. For example, our research group helped develop a device called AbStats<sup>®</sup>. This device has been cleared by the U.S. FDA to be used by healthcare providers in hospitals and other healthcare settings for non-invasive, real time recording of the digestive system. It uses a low-profile microphone that sticks to the abdominal wall to measure the number of times the intestines contract within a certain period. This measurement is also referred to as intestinal rate. In an early study, we found that AbStats<sup>®</sup> can recognize small, low-calorie meals from large, high-calorie meals in healthy people. While more studies are needed, the device may prove useful in monitoring diet and responses to medications or dietary treatments in those with FGIDs.

Another new technology are devices that are swallowed and monitor internal body functions. These devices can also provide a treatment. As an example, early studies in people with chronic constipation found that a vibrating capsule increased the number of bowel movements. Larger trials are ongoing to further prove the safety and value of this device.

## Virtual Reality

Another promising digital therapy for those with FGIDs is virtual reality (VR). While VR has been used for decades, it is now becoming more widely used. Recent new technologies have allowed VR headsets to become cheaper, more portable, and more accessible. Recent trials have shown that it reduces pain among hospitalized patients and pregnant, laboring women. VR may also be useful for treating chronic belly pain among those with IBS and dyspepsia. This use of VR has ongoing research to formally study the impact. Learn more about VR by viewing *IFFGD Podcast: Virtual*

*Reality in Healthcare* with Dr. Brennan Spiegel.  
<https://www.youtube.com/watch?v=5tmQi7rrgrA>

## **Conclusion**

Going forward, exciting new technologies will continue to become available for patients with FGIDs. As they are being developed, researchers should rigorously test these new devices and platforms. Well-designed research studies will be done to show their value and safety. Only then will these innovative technologies be widely used by patients and their healthcare providers. This, in turn, will dramatically change how we deliver care for patients with FGIDs and hopefully improve their outcomes and quality of life.

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## **About IFFGD**

The International Foundation for Gastrointestinal Disorders (IFFGD) is a 501(c)(3) nonprofit education and research organization. We work to promote awareness, scientific advancement, and improved care for people affected by chronic digestive conditions. Our mission is to inform, assist, and support people affected by gastrointestinal disorders. Founded in 1991, we rely on donors to carry out our mission. Visit our websites at: [www.iffgd.org](http://www.iffgd.org).

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