



Proteus Discover

In November 2017, The FDA gave regulatory approval to a first-of-its-kind pairing of a prescription drug with a feedback device. Approval of this feedback technology represents the first example of how Digital Medicine is set to revolutionize the way drugs are delivered in the U.S. The ingestible sensor, developed by Proteus Digital Health, has enormous potential to improve patients' engagement in their healthcare, resulting in both better health outcomes and a significant reduction in the \$290 billion per year that is currently wasted when patients do not take their medications as prescribed.

Background

- Proteus Discover® consists of an ingestible sensor the size of a grain sand, a small wearable sensor patch, an application on a mobile device and a provider portal.
- Proteus Discover helps providers identify the root cause for uncontrolled disease and facilitate medical decision-making while also helping promote patient medication adherence and engagement, leading to improved clinical outcomes.
- With Proteus Discover, patients can easily monitor their medication-taking patterns on their mobile devices.
- Physicians have access to objective data that enables them to initiate, titrate, eliminate or even change medication.
- Health systems are able to measure treatment effectiveness and optimize therapies.

Value

- Providing feedback ensures adherence, reducing treatment failures and the need to re-treat, as well as increasing efficiencies in monitoring.
- Digital Medicines™ provide an opportunity to mitigate the high costs of uncontrolled diseases.
- Medication non-adherence results in additional cost to the U.S. healthcare system of \$290 billion annually.



Cardiovascular Diseases

- In the U.S. around 75 million people have hypertension or high blood pressure, and only half of those patients are at their blood pressure goal.
- For every increase of 20mm Hg in systolic BP or 10mm diastolic BP, the risk of ischemic heart disease and strokes doubles.
- In 2010, hypertension and its complications cost the U.S. \$130.7 billion and are expected to increase to \$389 billion by 2030.
- Consistency in staying on medication and controlling blood pressure day in and day out is a key answer to this killer disease and Proteus Discover can be a part of the solution.
- Proteus has demonstrated that feedback from Digital Medicines effectively controls hypertension in previously drug refractory patients.

Diabetes

- About 29.1 million people in the U.S. have diabetes a major risk factor for heart disease and stroke this includes an estimated 8.1 million people who are undiagnosed.
- In 2012, diabetes cost the U.S. \$176 billion in direct medical costs \$69 billion in indirect costs or loss in productivity.
- Achieving and maintaining desired blood sugar levels over days and months with consistency with Proteus Discover can reduce the serious side, life altering complications of blindness, limb amputation, and other debilitating conditions.
- Proteus has demonstrated that feedback from Digital Medicines improves glycemic control in previously uncontrolled type 2 diabetic patients

Infectious Disease

- New oral Hepatitis C drugs must be taken as prescribed to achieve a cure. In medically underserved populations in particular, Proteus Discover can ensure that expensive drug therapies achieve their desired result of cure.
- Proteus has demonstrated that feedback from Digital Medicines can effectively treat hepatitis C in medically underserved populations
- For tuberculosis (TB) directly observed therapy (DOT) is recommended to ensure a cure and mitigate spread and resistance.
- DOT is research intensive, time consuming and represents the largest single cost of TB treatment.
- Wireless observed therapy (WOT) with Proteus Discover represents a more efficient option for TB therapy monitoring.¹

¹ TB HEOR Study. International Journal of Tuberc Lung Dis 2012; 16(11): 1498-1504.
<http://www.ingentaconnect.com/contentone/iatld/ijtld/2012/00000016/00000011/art000>



Opioids

- Prescription opioids can be prescribed by doctors to treat moderate to severe pain but can also have serious risks and side effects.
- Opioids—prescription and illicit—are the main driver of drug overdose deaths. Opioids were involved in 42,249 deaths in 2016, and opioid overdose deaths were five times higher in 2016 than in 1999.
- Being able to track and trace each opioid pill will ensure that patients in need get their medication and that the main source of diversion—the family medicine cabinet—is not a contributing source to our nation’s opioid epidemic.
- Patients in need of opioid medication can be monitored to assist in effective use, then weaned from therapy under physician supervision.
- The President’s Commission on Combating Drug Abuse and the Opioid Epidemic includes Proteus’s technology as part of its recommended solution.

Addiction Treatment

- Addiction treatment medications can also be a source of illicit drug use and are often diverted for this purpose.
- Proteus Discover can be a source of healing for the addict who is committed to recover by insuring that the prescribed addiction treatment medication is taken as prescribed and a social prevention against diversion for illicit use.