August 6, 2015

3D Printed Drugs: The Future is Now

Go ahead, admit it: When you read my health newsletter back in March, you likely laughed off the notion that 3D printed pharmaceuticals would appear any time soon. But earlier this week, the U.S. Food and Drug Administration approved the first-ever 3D printed prescription drug, Spritam.

Even I didn’t anticipate it would happen this fast. The pace of innovation today is swift. The outcomes are transformational.

Spritam, a reformulation of an existing epilepsy drug, emerges from the 3D printer in a tablet form that dissolves more readily upon ingestion. Aprecia Pharmaceuticals, the Ohio-based manufacturer, hopes that ease of use will encourage better patient adherence rates which would lead to better health outcomes. Aprecia uses a proprietary 3D printer known as ZipDose to make existing drugs in forms that are easier for patients to take. The company is focusing initially on drugs that affect the central nervous system.

Featured Initiative

Innovation’s fast lane? Check out InnovateNC.

Featured Report

Check out IEI’s Business Committee on Regulatory Science report.

Featured Video

Watch Prof. Joseph De Simone’s TED Talk, “What if 3-D printing was 100x faster?”
Regulatory Science + 3D Printing = the Acceleration of Personalized Medicine?

Researchers and health geeks like me have been excited for quite a while about the idea of medicines custom-created to match the needs of an individual patient. Today, most drugs are designed and tested for a general population. But that could change as contract research organizations (CROs), of which North Carolina has the largest concentration in the world, improve utilization of large data sets to accelerate clinical trials and understand how different drugs and dosages affect different people. This enhanced research plays out in the field of regulatory science, which addresses the development of new tools, standards, and approaches to assess the safety, efficacy, quality, and performance of health and life science products. IEI has been active working with stakeholders to encourage the regulatory sciences field in our state.

North Carolina is also a pioneer in 3D printing technology advances and has already made a name for itself in the fast-growing field. The Wake Forest Institute for Regenerative Medicine is the world’s first health research group to successfully engineer lab-grown human organs using a 3D printer. Researchers at NC State University have developed a technique for making 3D structures at the nanoscale, offering repeatable production that is also relatively inexpensive. Game-changing chemists at UNC Chapel Hill have invented an entirely new 3D method that allows solid objects to emerge continuously from the surface of a liquid media bath, an approach different from the layer-by-layer assembly of “traditional” 3D

Two of the 3D printed tablets, one in a 750 mg size, and the other in a 1,000 mg size, Courtesy of Aprecia Pharmaceuticals.
printing.

With cutting-edge university assets and an abundance of CROs, North Carolina could position itself as a leader in the advancement of personalized medicine. This would move us closer to the day when healthcare providers will, on demand, print out a prescription drug, medical device, or organ unique to your needs.

A Hurdle Removed

The FDA's Spritam announcement has encouraged researchers to envision the real possibility of doing 3D printing of medicine at scale. The new approval should pave the way for further innovation. Challenges and trade-offs, including a fear that these technologies could also drive the illicit drug trade, are inevitable. Still, my bet is on rapid expansion of 3D medicine because improved health and quality of life outcomes are likely to outweigh other risks.

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