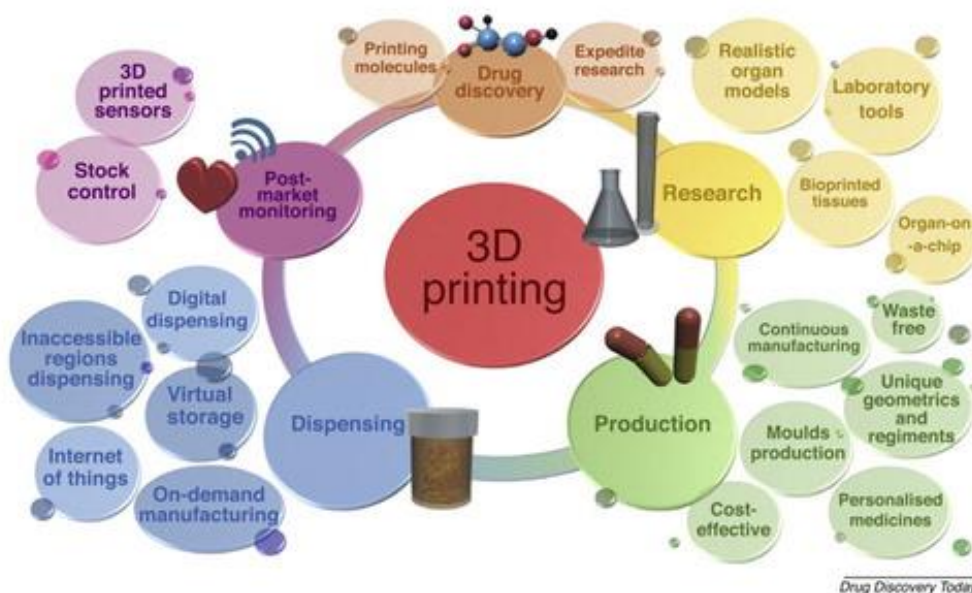


3-D PRINTING IN PHARMACY

3D Printing has recently gained momentum in developing various drug delivery systems for pharmaceutical applications which is reflected by the exponential rise in the number of published papers and patents in recent years altering drug delivery. When manufacturing 3D printed dosage forms that vary in their drug release profiles and characteristics. This innovative development was achieved through a proprietary Powder bed & inkjet 3D printing technology known as zipdose. In manufacturing an initial layer containing the drug itself laid down. That first layer then passes under an inkjet print head, and a binding liquid is printed at



specified location along the powdered sheet, successive layer are then printed up to 40 times depending on size of the tablet. Printing the layers allows the drug to be packed more tightly. A single tablet that would normally hold 200 mg can be layered to hold 1000mg.

APPLICATION OF 3D PRINTING

In 3D printed dosage form, they complex drug release that allows fabrication of complex geometries that are porous and loaded with multiple drugs throughout, surrounded by barrier layers that modulate release, is found. eg: printing of a multilayered bone implant with a distinct drug release profile alternating with rifampicin and isoniazid in pulse release mechanism. In research concerning drug release profile, chlorpheriamine maleate was 3-D printed on to a cellulose

powder substrate in amounts as small as 10-12 moles to demonstrate that even a minute quantity of drug could be released in specified time. This study displayed improved accuracy for the release of very small drug doses compared with conventionally manufactured medications.

The introduction of 3D printing in pharmaceutical industry has opened new horizons in the research and development of printed materials and devices. 3D printing technology lies in the production of small batches of medicines each with tailored dosages, size, shape and release characteristics. The manufacture of medicines in this way may finally lead to the concept of personalized medicines becoming a reality.

ADVANTAGES

Personalized medical devices & patient specific implants

Just in time manufacturing approach to on demand devices

Rapid medical prototyping

DISADVANTAGES

3-D printing process is not eco-friendly

Limited options of 3-D printing material

Inconsistent quality of 3-D printed objects

“3-D printing is changing personalized medical devices as we know them, from new , beautiful, conformal, ventilated scoliosis braces to millions of dental restoration & to beautiful bracings for amputees, another opportunity to emotionally reconnect with your symmetry”

- Avi Reichental

(Israeli-American businessperson in the 3D printing industry. He is the founder and executive chairman of Xponential Works, a venture investment, advisory and product development company)

Review done by : Aleena, Alyah, Anju (5th semester Bpharm)

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