INFOGRAPHIC

3D PRINTING IN THE MEDICAL SECTOR

2022

HOW IS THE TECHNOLOGY DEVELOPING IN MEDICINE?



Dentistry

Additive manufacturing in the dental sector helps in the development of crowns, dental implants or surgical guides.



Implants

Individualized implants are made using various 3D printing techniques adapting to the needs of patients.



Medical devices

By scanning body parts, measurements are taken to model medical applications in 3D that are adapted to each patient.



Bioprinting



Medications Whether with FDM, SLA or SLS



Surgical planning The model is created with the help

Similar to inkjet printing, bioprinting is created by mixing hydrogel and human cells. After printing, the individual cells grow together to form a living tissue.

technologies, 3D printed drugs enable personalized dosing for each patient.

of a CT scan, then scanned in 3D using special software and later produced using 3D printing.



Head / skull

Based on a CT scan of the patient, it is possible to produce 3D-printed skull or jaw implants from biocompatible materials.

Teeth / Dental

In the dental sector, 3D printing is used for a variety of applications, e.g. for the production of surgical stents, crowns or aligners.

Eyes

Hair

From 3D-printed corneas to pens that correct eye injuries, there are numerous ophthalmic applications.

L'oreal and Poietis have been

follicles that allow for natural

develop bio-printed hair

hair regeneration.

working together since 2016 to

Organs

Some bioprinting projects that are still in the development phase range from a heart to ovaries to kidneys.

Hand / leg prostheses:

3D-printed prostheses can be adapted to the patient and reduce manufacturing costs.

Splints / orthoses:

With the help of 3D scanning and additive manufacturing, we can develop personalized medical devices, such as patientadapted splints.

Skin

Numerous companies conduct clinical trials with bio-printed skin tissue for various purposes, such as cosmetics.

Bone

A ceramic-based ink has been developed that could allow surgeons to recreate 3D-printed bone parts with real living cells.

THE MOST IMPORTANT FACTS ABOUT 3D **PRINTING IN MEDICINE**

185,000

Amputations are performed annually in the U.S., causes range from vascular disease to trauma

(AMPUTEE COALITION)

\$5.800 BILLION

Is the estimated value of the medical 3D printing market by 2030

(ALLIED MARKET RESEARCH)

3.5 HOURS

The time needed to make a 3D printed heart with cells, blood vessels and ventricles

(TEL AVIV UNIVERSITY INTERNATIONAL)

Estimated annual growth rate for the medical 3D printing market until 2030

(ALLIED MARKET RESEARCH)

Is all it takes for the development of a 3D printed mini liver

(UNIVERSIDAD DE SÃO PAULO)





20.10%

40,000

per week to fight

COVID-19

3D printed valves used





TIMELINE

1984	Chuck Hull applies for the first patent for 3D printing technology (SLA)
2002	Scientists at Wake Forest University 3D print a functional miniature kidney
2007	Organovo, today a leader in the bioprinting industry, enters the market
2012	LayerWise creates first 3D-printed jawbone implanted in an 83-year-old woman
2014	First 3D-printed skull is implanted at the Medical Center in the Netherlands
2016	International Stem Cell Corporation develops the first functional ovary for a fertility study
2019	First 3D-printed heart made from human tissue at Tel Aviv University
2021	Patient Steve Verze receives the first 3D- printed eye prosthesis



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