The healthcare field is dominated by extremely high-cost procedures, products, and services. In the past decade, 3D printing has played a large role in the reduction of recovery prices. The event I am referencing is the integration of 3D printing into the healthcare field. Applying the historical interdisciplinary lens, the impacts of 3D printing in the medical field becomes evident.

While the first 3D printer was invented in 1987, it wasn’t until 2001 that the first synthetic scaffolds for human bladder tissue were printed by a Boston’s Children’s Hospital team and Harvard Medical School. This acted as the start of a revolution in the medical industry. Orthopedics also played a large role in the mainstream utilization of the technology. Everything down to the planning process of surgeries began including forms of 3D printing. Marcelo Galves published an article to the Journal of the AAOS stating that “The extra information provided by 3D–printed models can lead to a better intervention strategy, which is beneficial for patients because it decreases the risks, procedure times, and recovery times.” (Galvez, 2018)As more medical grade prints were sought after, printers became more and more advanced. Today, scientists are even bioprinting hearts and lung-mimicking air sacs.

While 3D printing allows us to print biological matter in a way that is impossible without the technology, it also happens to create much cheaper alternatives to traditional parts. Amputees all have different stories and slightly different amputations. For this reason, prosthetics are most commonly custom fit to the patient. The cost of a precise fit can be very costly though. For this reason, companies have started using 3D printing technologies to cheaply create custom fitting prosthetics. Xeometry explains that companies “leverage patient data like MRI and CT scans to create personalized implants, prosthetics, and anatomical models.” (Xeometry 2024)

Due to the high cost of prosthetics, many amputees are forced to live without. Depending on the amputation, it could mean they are forced to live life in a wheelchair. Students from the University of California San Diego understood the need for affordable prosthetics and created the LIMBER Prosthetics startup. LIMBER utilizes fast printing technology in order to print single piece prosthetic legs in under 12 hours. While they plan to sell the product in developed nations, the product will be free in undeveloped countries. Reportedly, “large scale could reduce the cost of a prosthesis by anywhere from 50% to 90%” (Patringenaru 2024). They have even partnered with a local veteran help center to supply prostheses to in need veterans.

There are a couple of limitations that 3D printing introduces. One limitation being the mass production of plastics. While there are filaments that exist which are formed from totally or partially recycled plastics, these filaments are expensive to produce and refine. For this reason, many large-scale companies choose to print from extracted raw materials as a cost saving measure. The industry and planet as a whole would greatly benefit from a cost efficient and effective plastic recycling system.

References

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