



Overview of the Medical Technology

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Editorial Note

Medical technology, or "Medtech," is a broad phrase that encompasses a wide range of healthcare products intended to address human diseases and medical issues. Early detection, less invasive treatment options, and shorter hospital stays and rehabilitation times are all intended to improve the quality of care provided. In recent years, medical technological improvements have also emphasized cost-cutting. Medical technology, in its broadest definition, includes medical devices, information technology, biotechnology, and healthcare services.

As a result of medical technology's effects, social and ethical issues develop. Instead of reading subjective patient reports, physicians, for example, can employ technology to gather objective data.

Consumerization of Medtech is a major driver of the industry's expansion. Because of the widespread availability of smartphones and tablets, providers can reach a large audience at a low cost, a trend that is projected to continue as wearable technology increases.

Types of Technology

Smartphones, touchscreens, tablets, laptops, digital ink, voice and facial recognition, and other medical technology have all shrunk in size. This technology allowed for the development of Electronic Health Records (EHRs), Health Information Exchange (HIE), the Nationwide Health Information Network (NWHIN), Personal Health Records (PHRs), patient portals, Nano medicine, genome-based personalized medicine, GPS, Radio Frequency Identification (RFID), telemedicine, Clinical Decision Support (CDS), mobile home health care, and cloud computing.

For many years, medical imaging and Magnetic Resonance Imaging (MRI) have been used and verified in medical research, patient evaluation, and treatment analysis. As medical imaging technology advances, such as the use of faster and more data, higher resolution images, and specific automation software, the possibilities of medical imaging technology are improving and producing better outcomes. As imaging hardware and software improves, patients will need to employ fewer contrasting agents and spend less time and money.

3D printing is another key innovation in healthcare. Among other things, it can be used to manufacture customized splints, prostheses, medical device parts, and inert implants. The ultimate goal of 3D printing is to generate interchangeable biological components that can be customized. The next section will go into 3D printing in healthcare in greater depth. New technologies include artificial intelligence and robots.

3D-printing

3D printing is the use of specialized machinery, software tools, and materials to automate the process of making specific items. Bio printing of human tissues and organs, prosthetics, medical implants, new pharmaceutical formulations, and bio printing of human tissues and organs are all booming.

For example, Surgical Theatre offers cutting-edge technology that can capture 3D virtual images of patients' brains in order to prepare them for treatments. Medical firms can utilize 3D printing to create prototypes for testing before undertaking an artificial tissue procedure.

The materials used in 3D printing are great for biomedicine since they allow for development with precise control over a variety of design parameters. Low-cost customization, more efficient designs, and time savings are all advantages of 3D printing. Due to the fact that different pharmaceuticals have variable release times, 3D printing allows for precise pill production. The method allows the pills to go to the targeted place and disintegrate safely within the body. As a result, tablets can be built to be more functional and efficient. In the future, doctors may offer a digital file with printing instructions instead of a prescription.

Furthermore, 3D printing will benefit medical implants. For example, a surgical team created a 3D-printed tracheal splint to aid a patient's breathing. This case exemplifies the power of 3D printing, which allows clinicians to create novel implant and equipment designs quickly.

Overall, 3D printing will be important in medicine's future since it can be used for surgical planning, artificial and prosthetic devices, pharmaceuticals, and medical implants.

Artificial Intelligence

Artificial Intelligence (AI) is a software programmer that enables computers to sense, reason, act, and adapt to their environment. AI isn't a new concept, but it's progressing at a dizzying speed. AI today has the ability to manage massive amounts of data, solve issues, and execute processes more efficiently. AI will hold more promise in healthcare since it improves access to information, improves healthcare, and decreases costs. Economic factors and the advent of big data analytics are the two most important factors driving AI in healthcare.

Costs, new payment options, and people's desire to improve health outcomes are the main economic drivers of AI. According to the estimates, AI could save \$150 million per year in the United States by 2026. By 2021, AI is expected to be worth \$6.6 million. Big data analytics is another important motivator because we live in the age of big data. The data is particularly valuable in assisting the integration of AI in healthcare since it ensures the execution of complex tasks, quality, and efficiency.

Applications of Artificial Intelligence

AI benefits the healthcare industry in a variety of ways. AI helps with disease identification, chronic problem management, health care delivery, and medication discovery. Furthermore, AI has the potential to address major health challenges. In the healthcare industry, AI can help plan and relocate resources. Patients can be matched with

healthcare providers who are a good match for them using AI. AI can also help improve the healthcare experience by using an app to identify patients' concerns. In medical research, AI aids in the investigation and interpretation of patterns and complex data.

For example, AI is useful in medication development because it can search for relevant research and analyze various types of data. AI aids in the detection of diseases, the analysis of clinical data, publications, and guidelines in clinical treatment. As a result, AI assists in the discovery of the best medicines for patients. Medical imaging, echocardiography, screening, and surgery are some of the other applications of AI in clinical care.

Robots

Modern robotics has made great strides and made a substantial contribution to healthcare. Doctors can enlist the help of robots for a variety of tasks. The usage of robotics in hospitals is fast increasing. Here are some instances of how robots can aid in the improvement of healthcare:

Surgical robots are a sort of robotic equipment that allows surgeons to bend and rotate tissues more efficiently and with more flexibility. The device features 3D magnification vision technology that can perfectly translate the surgeon's hand movements, allowing for minimal incision surgery. Another aspect of robotics systems is their potential to diagnose and treat cancer. Many scientists began working on a next-generation robot system to assist surgeons in doing knee and hip replacement surgery.

Traditional medical experts will benefit from assistant robots as well, as they will be able to reduce their workload. They can help nurses with simple but time-consuming tasks like carrying a large number of racks of drugs, lab specimens, or other delicate items.

In the near future, robotic tablets are expected to reduce the number of processes. They can be delivered to a patient's selected location. They can also do biopsies; take photographs of the area, and clear blocked arteries.

Overall, medical robots are quite useful in assisting physicians; yet, becoming professionally trained to deal with medical robots and having the robots follow a clinician's commands may take time. As a result, numerous scientists and corporations have been working to develop answers to these issues.

Assistive technologies are products that make life simpler for persons who have physical or cognitive disabilities. They want to improve people's lives by utilizing assistive technology. From low-tech solutions to true hardware and technological instruments, assistive technologies cover a wide range of themes. Vision impairment, hearing impairment, physical limits, and cognitive disability are the four categories of assistive technology. There are various advantages to using assistive technologies. They enable people to look after themselves, work, learn, have access to information quickly, improve independence and communication, and, lastly, participate actively in communal life.