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The Importance of Medical Technology in Next Few Years

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Abstract: *The "Piece of a Jigsaw Puzzle" analogy applies to how technology and medicine complete and complement one another. From diagnosis to therapy, the advent of new diseases and the complications of those that already exist provide significant challenges. By facilitating quick, efficient, and individualized diagnosis, treatment, and rehabilitation, medical technology can assist in overcoming these difficulties. The main goal of this article is to provide a brief overview of how technological innovation is transforming the medical industry and how it will shape medical practice in the future. Thanks to advancements in medical technology, a wide range of new business opportunities have emerged, expanding the potential for health entrepreneurs. Technological advancements have significantly changed healthcare, from anesthetics and antibiotics to magnetic resonance imaging scanners and radiotherapy. While technologies (new pharmaceuticals and treatments, new equipment, new social media support for healthcare, etc.) will drive innovation, human aspects will still be one of the stable restrictions of advances in the healthcare industry. No prediction can please everyone, but in order to help us think more clearly about how to go where we want to go, this essay investigates snippets of the future.*

Keywords: future healthcare technology, human factors

I. INTRODUCTION

Technology in the medical field has a very bright future. There are a lot of fresh and cutting-edge approaches to disease diagnosis and treatment thanks to the quick evolution of technology.

Healthcare delivery is being profoundly affected by the fast advancement of medical technology. We can anticipate many more advancements in medical technology in the next years, which could help millions of people live better lives.

The future of healthcare is in information technology, and the most recent news in technology and health may teach us a lot. Technologies in healthcare use tools, devices, and new inventions to apply knowledge and skills to address healthcare concerns. The major goals of technology in healthcare are to increase access to high-quality treatment, manage staff and operational operations, and increase health center's productivity. With the aid of healthcare technology, the medical industry can address or ameliorate persistent problems including excessive costs, protracted wait times, restricted access to insurance, and a lack of healthcare professionals.

Healthcare technology trends are characterized by innovations like artificial intelligence (AI) and digital technology to handle emergencies and enhance virtual care. Emerging developments in healthcare technology include telemedicine, mobile health, virtual conferencing, and the internet of medical things (IoMT).

The future of healthcare technology may easily be predicted, according to experts, since machine learning, artificial intelligence (AI), and cloud technologies that apply to workplace, clinical, and financial processes will be more fully integrated into the sector.

But in order to get there, healthcare leaders must start setting the cultural groundwork now for the technological advancements that will come in the following ten years.

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II. LITERATURE REVIEW

Some of the most promising areas of medical technology development include:

Artificial intelligence (AI):

History of AI

The use of artificially intelligent systems for patient diagnostics has come a long way. For instance, Esteva et al. and Hekler et al. employed clinical imaging data to create classification models to help doctors diagnose skin cancer, skin lesions, and psoriasis in the field of visually focused specialties like dermatology. They also proved that the DCNN performed on par with 21 dermatologists who were board-certified. In comparison to doctors who spend years in medical school and also relied on experience they developed through patient care, their research showed that AI systems were capable of classifying skin cancers with a level of competence comparable to dermatologists and required only a fraction of the time to train the model.

Present Day Use of AI

In order to combat the novel coronavirus (COVID-19) pandemic, the most current use of AI in global healthcare is the prediction of emergent hotspots utilizing contact tracing and flight traveler data.

Government agencies utilize contact tracing as a disease prevention strategy to stop the spread of a disease. Contact tracing works by getting in touch with, educating, and ordering those who have been exposed to a person who has contracted the disease to quarantine themselves in order to stop the sickness from spreading. According to Apple Newsroom,[18] tech goliaths Google and Apple have teamed up to develop a platform for contact tracing that would employ artificial intelligence through the use of application programming interfaces, or APIs, as they are known on mobile devices.

This technology is being used to create novel diagnostic instruments, therapeutic choices, and even surgical robots.

New diagnostic tools are being created, treatment regimens are being more accurately executed, and patient care is being made more individualized thanks to artificial intelligence (AI). For instance, AI-driven systems are being used to analyze medical imaging and spot potential issues that could go undiscovered otherwise. AI is also being utilized to create novel medications and treatments as well as to increase the effectiveness of medical procedures.

Gene editing: New cures for diseases like cancer and sickle cell anemia are being developed using gene editing technologies like CRISPR (Clustered regularly interspaced short palindromic repeats).

3D printing: Custom medical products, such as prosthesis, implants, and surgical guides, are being produced using 3D printing.

Virtual reality (VR) and augmented reality (AR) are being utilized to deliver immersive therapeutic experiences, train surgeons, and give patients a better knowledge of their conditions. For instance, doctors are trained on intricate surgeries using VR headsets instead of actual patients. Patients are using AR headsets to see their conditions and comprehend the advantages and disadvantages of various therapy alternatives.

Telemedicine: Patients can get care remotely from physicians and other healthcare professionals, which can increase access to care and save expenses.

These are just a few of the many ways that medical technology is changing healthcare. As these technologies continue to develop, we can expect to see even more dramatic improvements in the quality of care that is available to patients.

III. RESEARCH METHODOLOGY

The following trends are anticipated to define the research methods for medical technology in the upcoming years:

A stronger emphasis on multidisciplinary research. It takes knowledge from several different academic fields, including biology, engineering, computer science, and mathematics, to succeed in the complicated subject of medical technology. Researchers will need to work together and share their expertise across fields in order to make meaningful progress.

Using artificial intelligence and large data. The world of medical technology is no exception to how quickly big data and artificial intelligence (AI) are changing how we work and live. These tools are being used more and more by researchers to examine massive datasets and spot patterns that might otherwise go undetected. This is resulting in new understandings of disease and fresh approaches to creating and delivering medical therapies.

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The advancement of personalized healthcare. Healthcare that is individualized for each patient based on genetic composition and other factors is known as personalized medicine. Technology advancements in other areas, such as genomics, have made it possible for researchers to gather and examine vast volumes of patient data, which has made this viable. We may anticipate substantial advancements in the field of personalized medicine, which has the potential to completely change the way we approach disease treatment, during the coming years.

The following elements will also have an impact on medical technology research technique in the upcoming years in addition to these trends:

- Growing funding options for medical research.
- Public desire for better healthcare is rising.
- The rise in chronic illness prevalence.
- The development of new technologies like nanotechnology and gene editing.

In general, the focus on multidisciplinary collaboration, the use of big data and AI, the development of personalized medicine, and the growing accessibility of funding are anticipated to characterize the research approach for medical technology in the upcoming years. These developments will speed up scientific progress and pave the way for ground-breaking new treatments for a variety of ailments.

Here are some instances of how these developments are already being applied in the field of medicine:

Big data and AI are being used by University of California, San Francisco researchers to create novel approaches to predicting the risk of heart disease.

New cancer medicines are being created by a group of experts at the University of Cambridge using personalized medicine.

Gene editing is being used by a team of researchers at the Massachusetts Institute of Technology to create novel treatments for hereditary illnesses.

The research approach for medical technology is changing in a variety of ways, of which these are only a few instances. We may anticipate seeing even more advancement in the years to come as these tendencies continue to grow.

IV. ANALYSIS AND FINDINGS

- Ongoing price increases are anticipated for medical technology. Because of the rising complexity of these technologies and the high price of research and development, this is the case.
- Personalized medicine is in greater demand.
- This occurs as a result of people's growing understanding of genetics' significance and potential impact on health.
- More training is required for healthcare professionals in the application of contemporary medical technologies. This is because these technologies are getting more complicated and need specialized training.

V. CONCLUSION

In conclusion, the medical technology industry is positioned to experience considerable breakthroughs in the coming years. The way we prevent, diagnose, and treat medical issues is predicted to undergo a revolution due to rapid technological improvements and rising demand for creative healthcare solutions.