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# Chapter 7

## Bringing Intelligence to Medical Devices Through Artificial Intelligence

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### ABSTRACT

*Artificial intelligence is one discipline that seeks a lot of interest as it combines human brains and machines. Firstly, to elucidate some of the salient features, interests, and issues related to artificial intelligence, this chapter will briefly elaborate on the need for artificial intelligence in healthcare. As a backdrop to this discussion, a short reflection on various types of artificial intelligence, the advantages, and disadvantages will also be discussed in this chapter. This chapter will also present a brief investigation of emerging challenges in incorporating human minds with medical devices. The chapter will also provide a brief perspective about the future advancements that would facilitate the healthcare delivery system and also improve patient outcomes. The chapter concludes by considering a few solutions which would have a potential impact on current challenges being faced by artificial intelligence and healthcare systems.*

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## INTRODUCTION

Artificial intelligence is slowly becoming a well-understood multidisciplinary field that includes intelligent machines, computer vision, expert systems, and language recognition techniques. Artificial Intelligence also plays a crucial role in processing various languages which is similar to the simulation of human intelligence. Just like human brain simulation several simulations have been designed and implemented to bring intelligence to medical equipment. The hype around artificial intelligence has increased rapidly. The evolution of AI has been of great help in revolutionizing huge developments in the field of healthcare. The fast-growing feature of AI is causing an impact on human lives and humans are trying to adapt to the changes in a great manner. Artificial Intelligence in other words can be described as an alternative to human intelligence and has one important goal which is the automation of activities that currently require human intelligence and intervention. In this chapter, we have quantified and analyzed the connection between healthcare equipment and human intelligence. The findings indicate an increase in scientific innovations related to Artificial Intelligence. This chapter will provide a deep insight into current innovations as well as computerized medical diagnostics.

While discussing medical devices and artificial Intelligence the prime concern that comes to our mind can be classified into three different categories:

- Impression
- Control
- Interpretation
- Divulgence
- Intelligence

These criteria provide a deep insight into the world of artificial intelligence. Let us discuss each and every criterion in detail. Starting with the impression, this criterion is concerned with establishing models for obtaining inputs from the physical world. To be more specific we can name it as sensory inputs like audio or visual inputs. The second criterion deals with controlling the device or the system. Control is concerned with articulating the extremities like in the case of Prosthetic arms or locomotion devices. Interpretation is another criterion that is associated with a higher level of cognitive applications such as diagnosing, planning, designing, etc. Divulgence on the other hand helps in conveying or broadcasting sensitive information safely with confidentiality. Finally, the intelligence of the machine helps in improving the system performance by automating updating and troubleshooting processes.

What do we actually mean by AI in healthcare? How is it related to medical Instruments? Is it possible to make intelligent medical devices? Are they safe? A lot of questions arise when we think about the concept of introducing AI in the healthcare industry. The applications of combining Artificial intelligence with healthcare are going to be vast. Healthcare needs and processes are evolving along with the evolution of technologies. The concept of Artificial intelligence should also be able to enhance and improve the healthcare delivery system.

Artificial Intelligence has now become a top priority for healthcare decision makers, Innovators, and Researchers. It is a broad definition that includes image processing, language processing, machine learning, and deep learning tools. According to recent statistics countries like Germany, Finland, UK China are in pursuit to combine AI in healthcare. These countries are also investing heavily on Artificial Intelligence research work. A significant role is also played by the private sector in funding top firms

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