Note

To the creative architect behind our scholarly publication Dr. Md. Nazrul Islam, designed the cover of the Journal of Patuakhali Medical College (JPkMC). His dedication to crafting a cover that translate concepts into visually stunning designs is a testament to his talent and expertise.

We extend our heartfelt gratitude for his unwavering commitment to excellence. His contribution enriches not just the visual appeal of our journal, but also adds depth and meaning to the content within.

With sincere appreciation,
Dr. Md. Zahirul Islam
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Editorial

Revolutionizing Healthcare: Robotics in Medicine

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Robotics has revolutionized the healthcare industry in the twenty-first century, with traditional practices undergoing significant transformations across various medical domains. From operative techniques to diagnostic procedures and support for disabled patients, its impact has been profound and far-reaching. This transformation has been facilitated by the high precision of robots, heralding a new era in the healthcare system.

Three general areas of advanced robotics are identified: macro robotics, micro robotics and bio-robotics.[1] Mechanical works like wheel chair, patient manipulators for rehabilitation can be handled with macro robotics, micro robotics include micro instrumentation during surgery and bio-robotics used to understand the physiological processes.

Robotics can modify healthcare services across the entire spectrum of life, from before birth to afterlife, in various ways.[2] Examples of different robots are the da Vinci Robotic surgical system, Veebot for blood investigation, Hanako the robotic dental patient for dentist training, for patient care RP-7 robot ancd Robot for Interactive Body Assistance (RIBA).[2]

In the healthcare system, especially in the field of surgery, robotics has expanded its horizons. Robotics was integrated into surgery for its mechanical advantages, such as a degree of rotation that surpasses human capability. Miniature cameras, instrumentation, teleoperation, and access to difficult sites have been achieved with the help of modern robotic systems. The first surgical robot was developed by Intuitive Surgical and was named da Vinci, in honor of Leonardo da Vinci.[3] It has a console that controls the articulated arms.

Some forms of artificial intelligence (AI) can help in disease diagnosis by analyzing medical images. In cases of early diseases, there might be human errors in detecting subtle changes where AI-driven analysis has enhanced precisions. In the diagnostic field image guided procedures and navigation systems have significantly changed with the help of robots. Blending the image guided navigation systems along with advanced surgical techniques with high precision has improved the patient care and has enhanced recovery rates.

Robots are serving as assistants in several medical fields as they have improved their social skills and reliability.[4] In diagnostic field blood collection has been automated with Veebot.[2] This robot utilizes an infrared light to identify a vein and uses ultrasound to analyze blood flow. After confirmation, needle is inserted to draw venous blood with 83% accuracy.[5]

In rehabilitation, robotics helps in movement of disabled patients. These devices are equipped with sensors and intelligent control systems. Some robots can be controlled with voice command but sometimes modifications are needed for some special conditions like dysarthria. Recent advances have made this possible.[6] Robots can be used beyond medical care,

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including dispensing medicine, sterilization, and even patient companionship.

Challenges regarding the use of robot include high cost, public misconceptions, ethical issues and regulations. These challenges can be overcome with comprehensive training. Awareness among the healthcare professionals regarding advances in technology can shift the paradigm toward the new era of robotics and AI.

There are some misconceptions about robots and artificial intelligence seen among the public.[7] These misconceptions are fueled by some media and lack of understanding. However, with proper policy implementation and education initiatives, can address this issue. Clear communication about the capabilities and limitations of robotics and AI is essential for fostering informed public discourse.

With thoughtful regulation, investment in education, and interdisciplinary collaboration, this revolution will reform the future healthcare system to be more efficient and effective than ever before.

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