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"THE NEXT ERA OF PATIENT SAFETY: AI-POWERED SOLUTIONS"

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Abstract: **Introduction:** Artificial intelligence (AI) has emerged as a transformative tool in healthcare, particularly in enhancing patient safety measures. By leveraging AI algorithms and data analytics, healthcare systems can proactively detect, prevent, and mitigate clinical-level patient safety concerns. This introduction outlines the significance of AI in revolutionizing patient safety practices, promising improved outcomes and reduced adverse events.

Aim and Objectives: To utilize artificial intelligence (AI) to advance patient safety within healthcare systems by implementing innovative solutions and practices.This systematic literature review had the objective to find and evaluate quantitative research that addressed and reported clinical-level patient safety issues by integrating or using AI.

Summary: Artificial intelligence revolutionizes patient safety by leveraging advanced algorithms for early detection of adverse events, personalized medication management, and clinical decision support, though challenges such as data privacy and algorithm bias require ongoing attention for effective implementation.

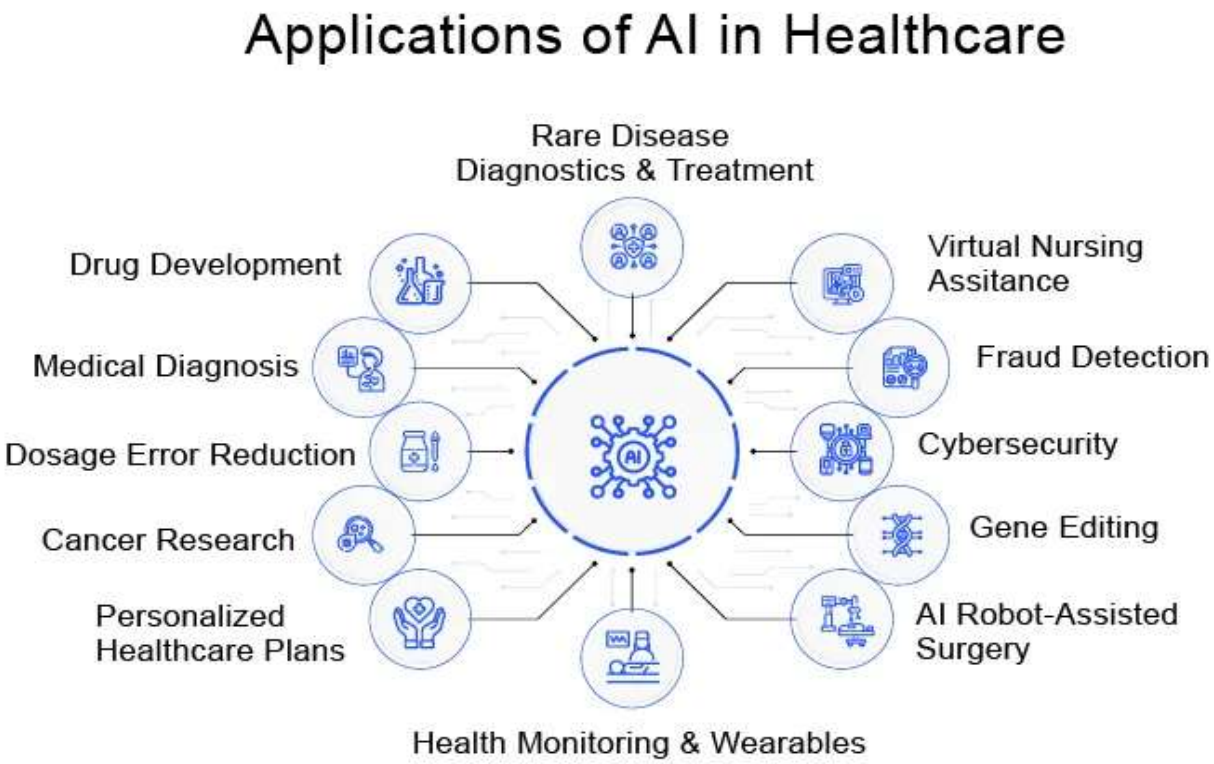
Conclusion: According to this systematic review, if utilized appropriately, AI-enabled decision support systems can help to improve patient safety by facilitating better medication management, error detection, and patient stratification. To learn further about how effectively AI can predict safety outcomes in healthcare settings, further work is still required for these systems' strong validation in hypothetical and actual clinical scenarios.

Keywords: Artificial intelligence, Patient safety, Clinical-level, Quantitative studies, Systematic literature review

I. INTRODUCTION

Patient safety is a top priority for healthcare facilities and patients. It refers to the efforts of clinical providers to reduce or avoid preventable harm to the patient during treatment[1].

Artificial intelligence (AI) is the use of machines to mimic human cognition. AI is used in healthcare to improve the patient experience, including diagnosis, treatment, and outcomes[2-3].



Benefits of AI in Patient Safety: [4]

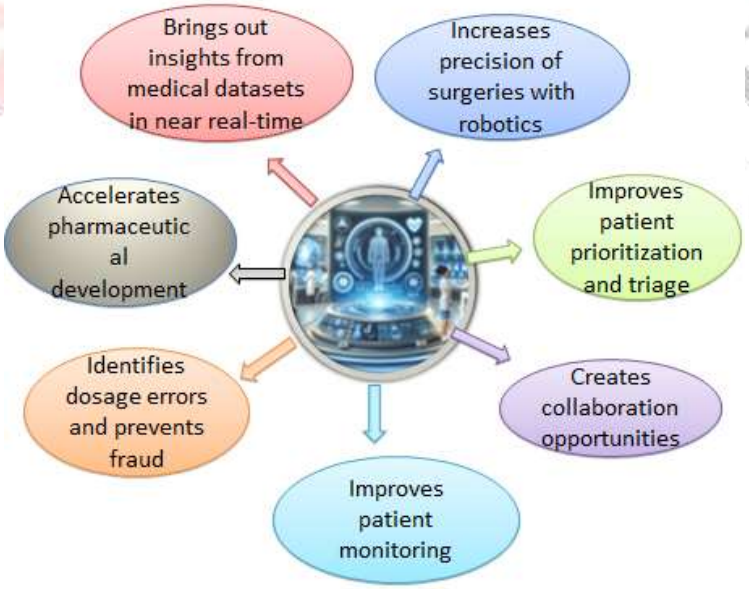
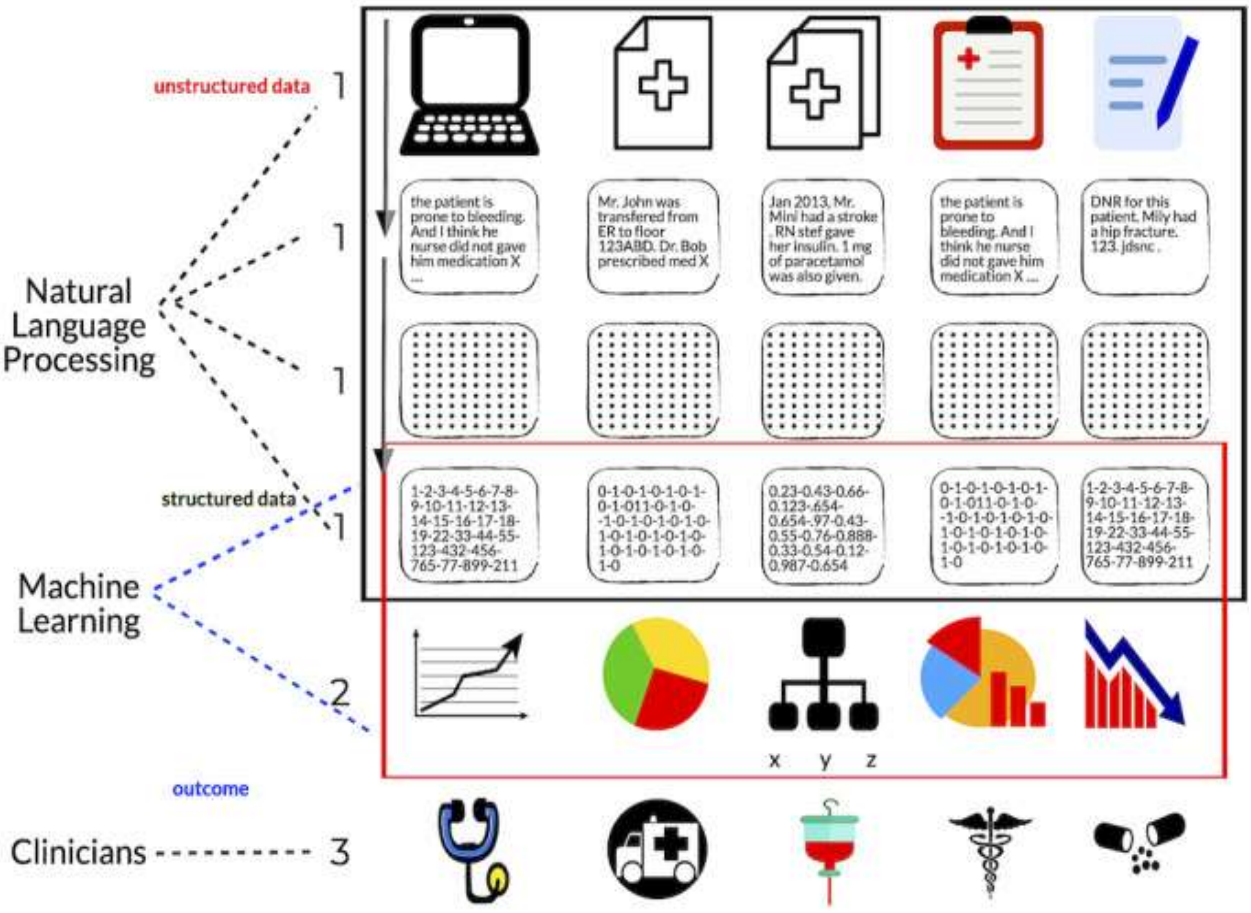


Fig: Schematic illustration of how natural language processing converts unstructured text to machine-readable structured data, which can then be analyzed by machine-learning algorithms.[5]

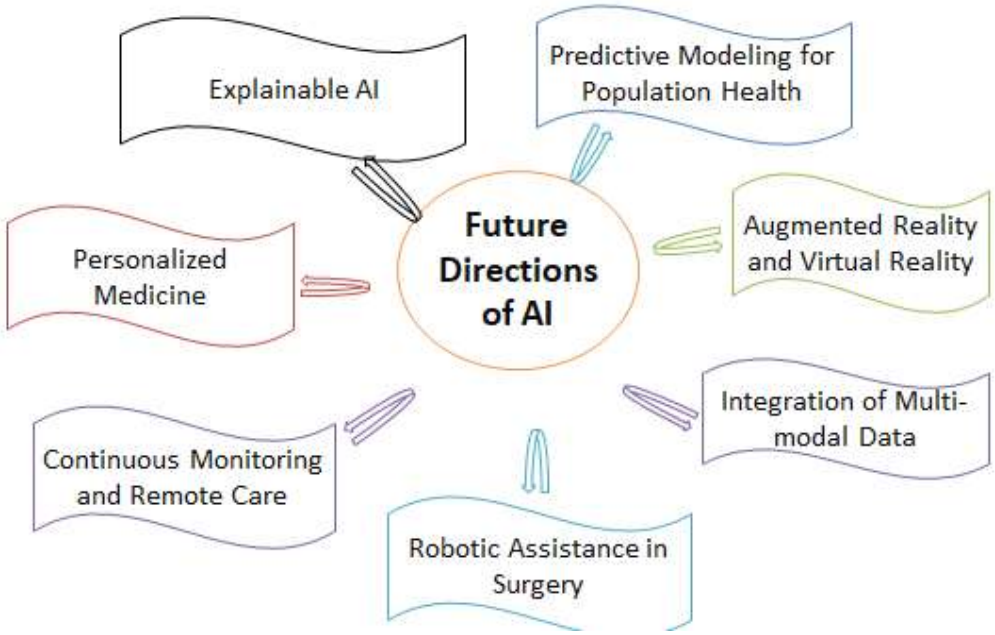


Artificial intelligence (AI) can be broadly defined as “a computer program that is smart enough to make smart decisions.” The operational definition we use in this review is that of a computer program or health care device that can analyze large amounts of health care data, uncover hidden information, detect threats, and improve communication.

In this context, AI includes machine learning as well as natural language processing (NLP). Machine learning allows computers to use labeled or unlabeled data to detect hidden information or to make predictions about that data without explicitly programming it. Among the various types of artificial intelligence, machine learning or natural language processing have social implications in health care and are often used in health care.

The third type of machine learning is reinforcement learning, where an algorithm tries to do something while learning from its mistakes and successes. Machine learning also includes artificial neural networks (ANNs) or deep learning. Natural language processing (NLP) aims to build a computer's understanding of human language and gradually converts text into structured data that can be interpreted by machine-learning algorithms[6].

Within the literature, there is a lack of clear demarcation between natural language processing and machine learning. However, Figure 1 demonstrates the integration of these two techniques in healthcare research[7].



Conclusion: AI represents a transformative force in patient safety, offering innovative solutions to longstanding challenges in healthcare delivery. By harnessing the power of AI, healthcare systems can achieve improved clinical outcomes, enhanced patient experiences, and ultimately, a safer and more efficient healthcare environment for all. However, it's crucial to address challenges such as ethical considerations, data privacy, and regulatory compliance to ensure the responsible and equitable implementation of AI in patient care.

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