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ARTIFICIAL INTELLIGENCE USING IN MODERN CARDIOPATHOLOGY

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In the digital age, technology reshapes nearly every aspect of our lives, from how we communicate to how we manage our health. Among the most revolutionary advancements is artificial intelligence (AI), which utilizes algorithms and vast data sets to perform tasks traditionally requiring human intelligence. In healthcare, particularly in cardiopathology, AI is making significant strides, enhancing diagnostic accuracy, treatment efficacy, and patient outcomes.

AI algorithms, particularly deep learning models, have transformed the analysis of cardiovascular imaging. Convolutional Neural Networks (CNNs) are employed to scrutinize echocardiograms, MRIs, and CT scans, identifying subtle anomalies that may indicate diseases such as coronary artery disease (CAD) or cardiomyopathies. These tools enhance the ability to detect issues earlier and with greater accuracy. AI is revolutionizing histopathology by analyzing cardiac tissue samples to identify pathological features. Tools like PathAI leverage machine learning to examine histological slides, improving the accuracy of diagnosing conditions such as myocarditis and hypertrophic cardiomyopathy. This technology reduces human error and accelerates the diagnostic process, allowing for timely interventions. AI-driven predictive analytics are crucial in forecasting patient outcomes. By analyzing a combination of clinical data, genetics, and lifestyle factors, AI models can predict the risk of cardiovascular events such as heart attacks or strokes.

Unfortunately, there are no successful examples of AI using in pathomorphological diagnostic of different types of cardiomyopathies, only hypertrophic. There is a perspective scientific branch development with probability to create specific cardiomyopathy AI to simplify diagnostic process with difficult clinical cases and situations when «third opinion» is needed. The integration of AI into cardiopathology signifies a major modernization of the field. As these technologies continue to evolve, they promise to enhance diagnostic precision, streamline workflows, and improve patient outcomes. The collaboration between AI systems and healthcare professionals is essential for maximizing the benefits of these innovations. Moreover, the democratization of advanced diagnostic tools facilitated by AI can help mitigate healthcare disparities, ensuring that high-quality cardiovascular care reaches underserved populations. By embracing these technological advancements, the healthcare sector can adapt to the growing demands of modern life while improving cardiovascular health on a broader scale. In conclusion, the convergence of artificial intelligence with cardiopathology represents a pivotal shift in how we approach cardiovascular diseases. By leveraging the power of AI, we can enhance patient care, improve diagnostic accuracy, and ultimately save lives, paving the way for a healthier future.