

Cutting-Edge Work: AI in Cardiovascular Medicine

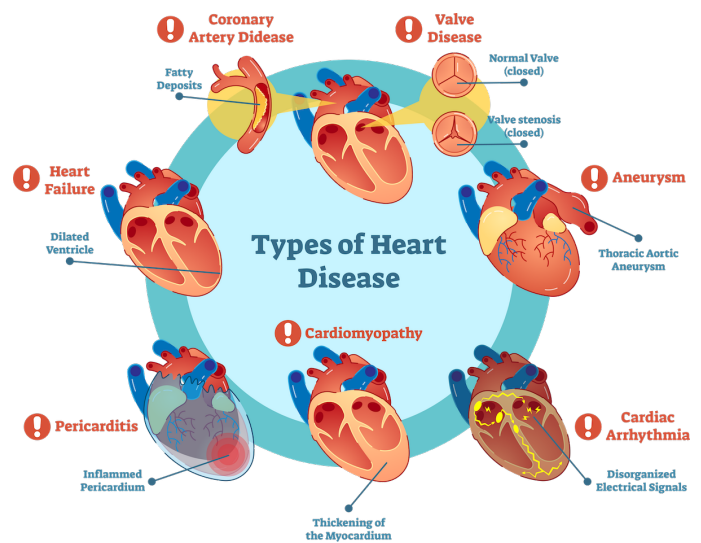
CSSE413-01

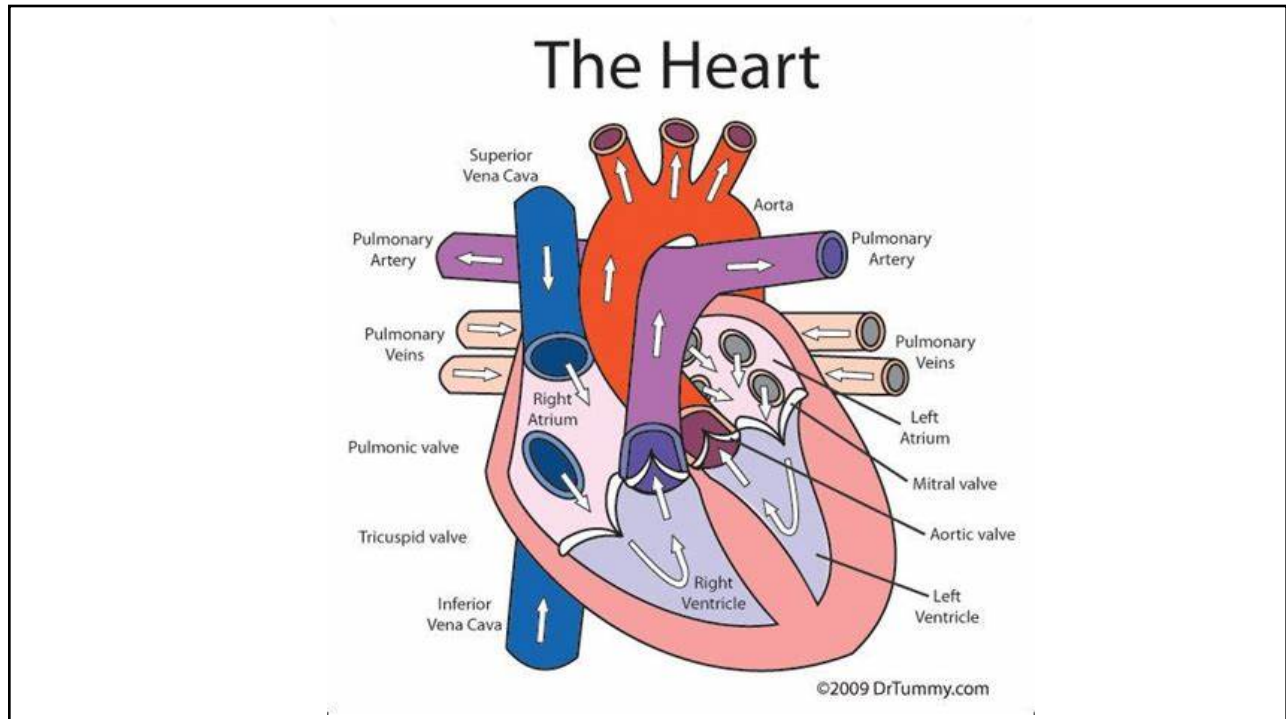
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2024-05-10

Introduction

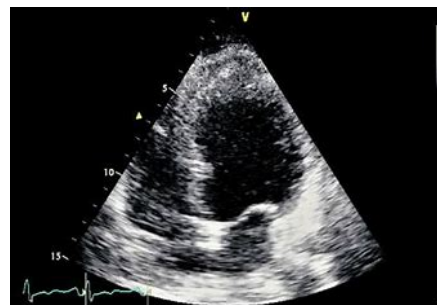
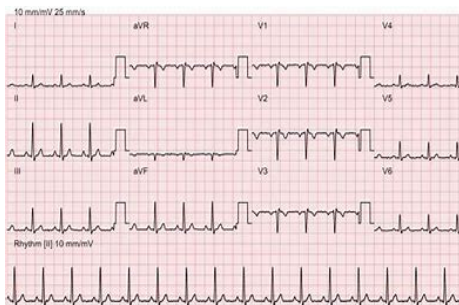
- In the US, over 900,000 people die from cardiovascular disease in 2023 alone
- Artificial Intelligence in Cardiovascular Medicine: Current Insights and Future Prospects” by Ikram U Haq, et al.



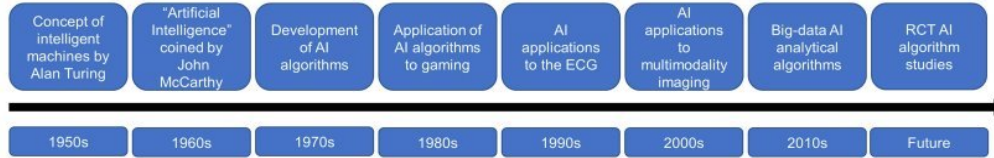


History

- 1990: self-learning neural networks applied to electrocardiography (ECG)
- 1999: echocardiography (echo) to segment images into either blood or tissue regions.



Contemporary Applications of AI in Cardiology



Heart Failure

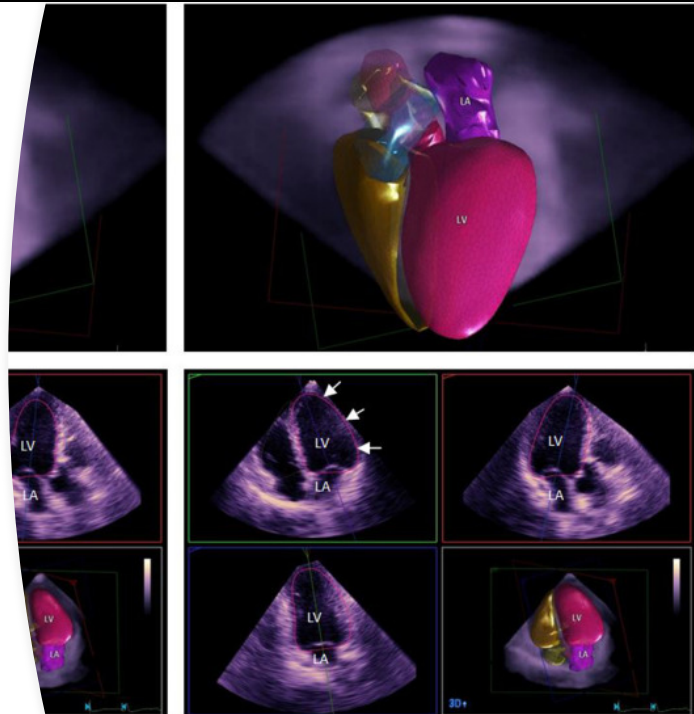
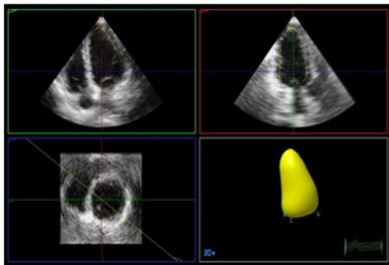
Electrophysiology

Valvular Heart Disease

Coronary Artery Disease

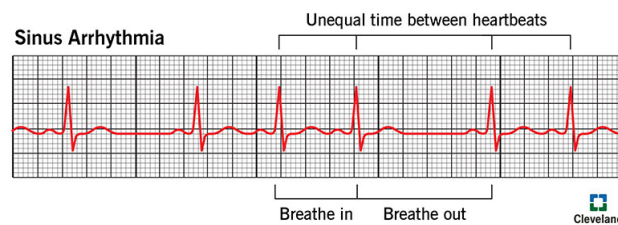
Heart Failure (HF)

- "HeartModel A.I."
- 3D echocardiography automatically measure cardiac volumes and function

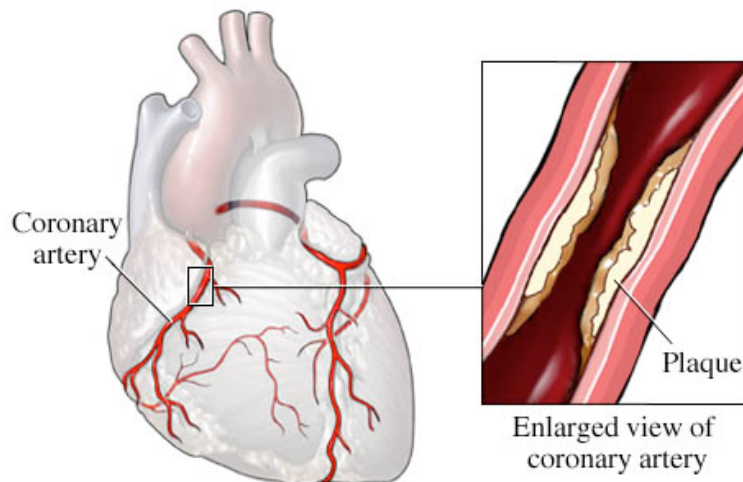


Electrophysiology

- Diagnose arrhythmias
- Diagnose electrolyte derangements from the ECG
- Predict the future onset of arrhythmias



Coronary
Artery
Disease
(CAD)



Coronary Artery Disease and AI

Treatments

Risk assessment

Mortality
predictions

The Future

- A focus on speed and effectiveness
- More clinical trials
 - Clinical utility
 - AI-ECG algorithm

Challenges



Algorithms need labeled datasets



Overfitting



Black-box

Conclusions



Key advancements



Growth of AI and cardiovascular disease

Questions

