Artificial Intelligence in Healthcare

Supporting Human Care with Compassion

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- **For those watching in groups:**
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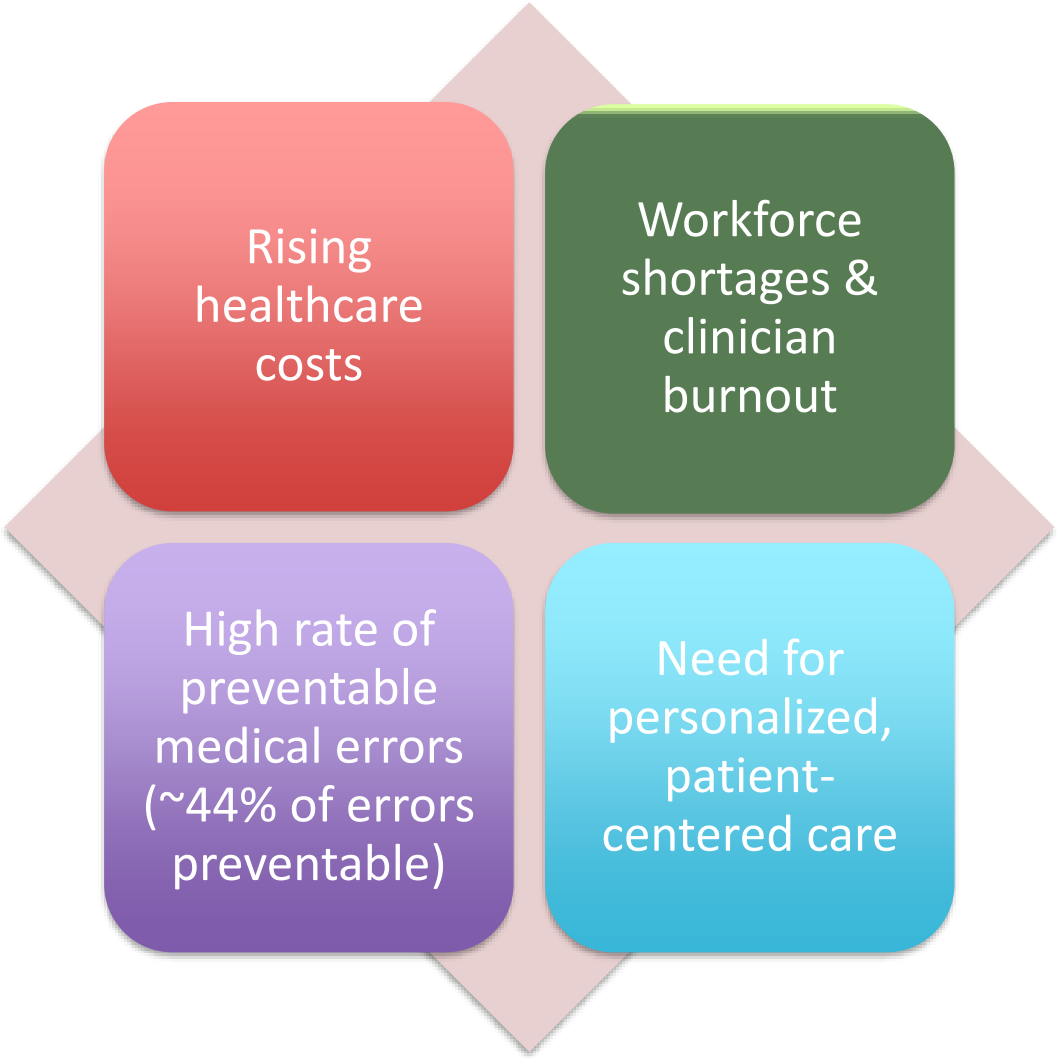
Learning Objectives

- Describe how AI is currently being used in diagnostics, treatment planning, workflow optimization, and patient monitoring
- Identify way AI can support, rather than replace, clinical judgment, patient interactions, and compassionate patient-centered care
- Examine ethical concerns and future applications
- Examine real-world case studies where AI has successfully augmented healthcare professionals' expertise while preserving the human touch and care delivery

AI IN HEALTHCARE

Why AI Matters



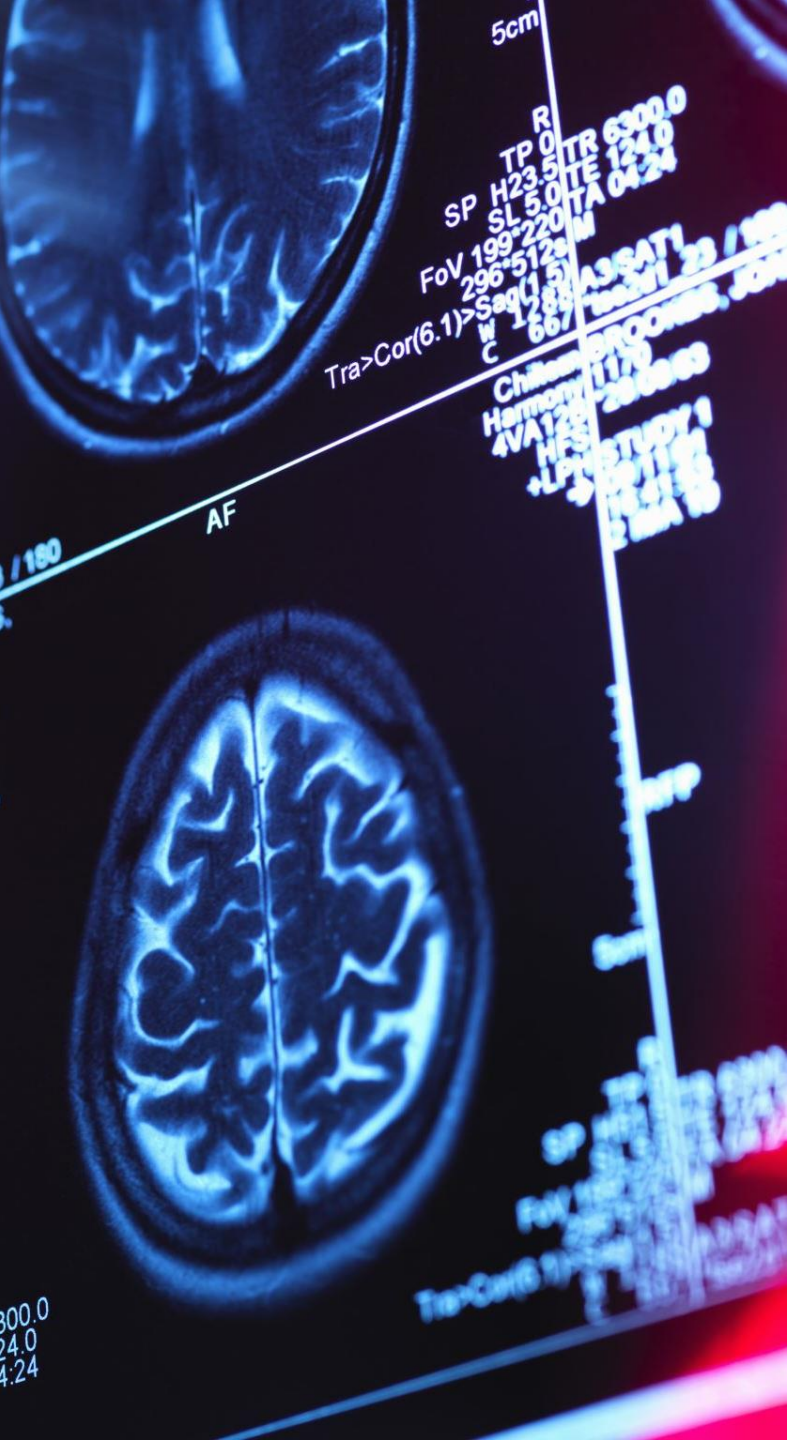
What AI Is (and Isn't)

Artificial Intelligence: machines simulating human tasks

Machine Learning: systems that learn patterns from data

Deep Learning: neural networks for complex tasks like imaging

AI is an assistant, not a replacement for human clinicians



AI IN DIAGNOSTICS

Diagnostics and Treatment

- AI algorithms can analyze medical images, such as X-rays, CT scans, and MRIs to help detect abnormalities and diseases
- AI can analyze large data sets to identify patterns and assist with diagnoses of disease
- AI-powered robotic devices assist in the OR
- Clinical Decision Support Systems

Care Planning

AI can analyze patient data and help create personalized treatment plans based on individual needs and genetic make up

AI can write individualized discharge planning

AI automatically notifies and fills orders

Workflow optimization

AI-powered chat boxes can provide answers to common patient questions and concerns

AI can assist with scheduling and preparing for a patient visit

Ambient listening – can capture conversations and prepare visit summaries, generate instructions or prescriptions

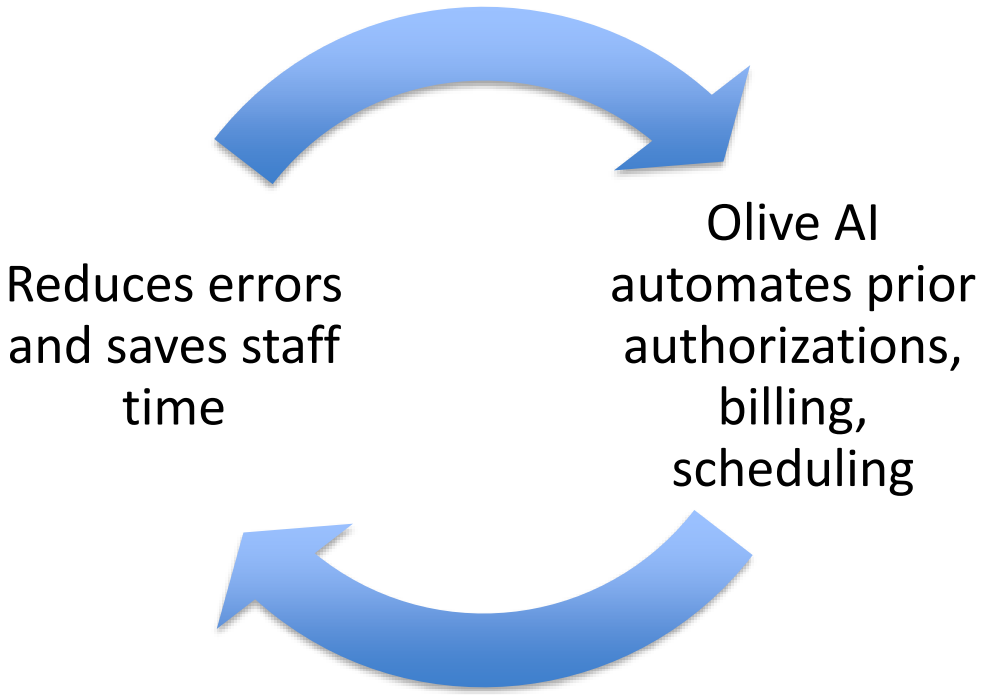
AI Products In Use

EHR Predictive Analytics

Epic Systems integrates AI into electronic health records

Predicts readmissions, identifies high-risk patients

Administrative Automation



Hospital Flow Optimization

Qventus optimizes OR scheduling, ER wait times, and discharges

Supports resource allocation in real-time

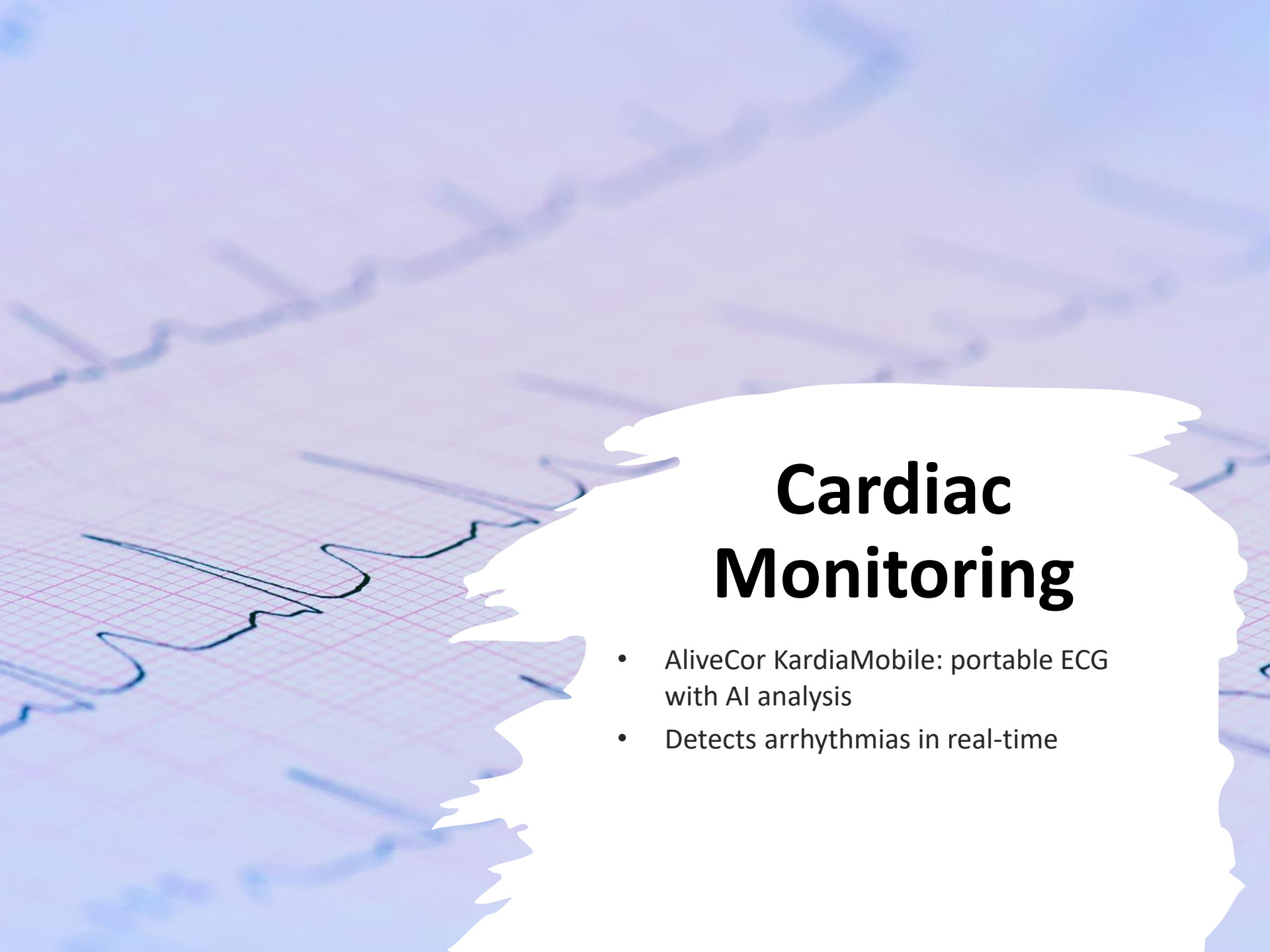
Patient Monitoring

- AI can be incorporated into remote patient monitoring tools to provide real-time insights into patient conditions and potential complications

- Heart monitor, ventilators, virtual sitters and virtual bed rails, IV pumps

Wearables

- Apple Watch: detects atrial fibrillation, fall alerts
- Fitbit: tracks sleep, heart rate, oxygen levels



Cardiac Monitoring

- AliveCor KardiaMobile: portable ECG with AI analysis
- Detects arrhythmias in real-time

Diabetes Care

- Medtronic Guardian Connect: continuous glucose monitor with AI prediction
- Alerts patients to impending highs and lows

Diagnostics

Medical Imaging

- Aidoc: detects brain hemorrhage, pulmonary embolism, fractures
- Arterys: cardiac MRI interpretation

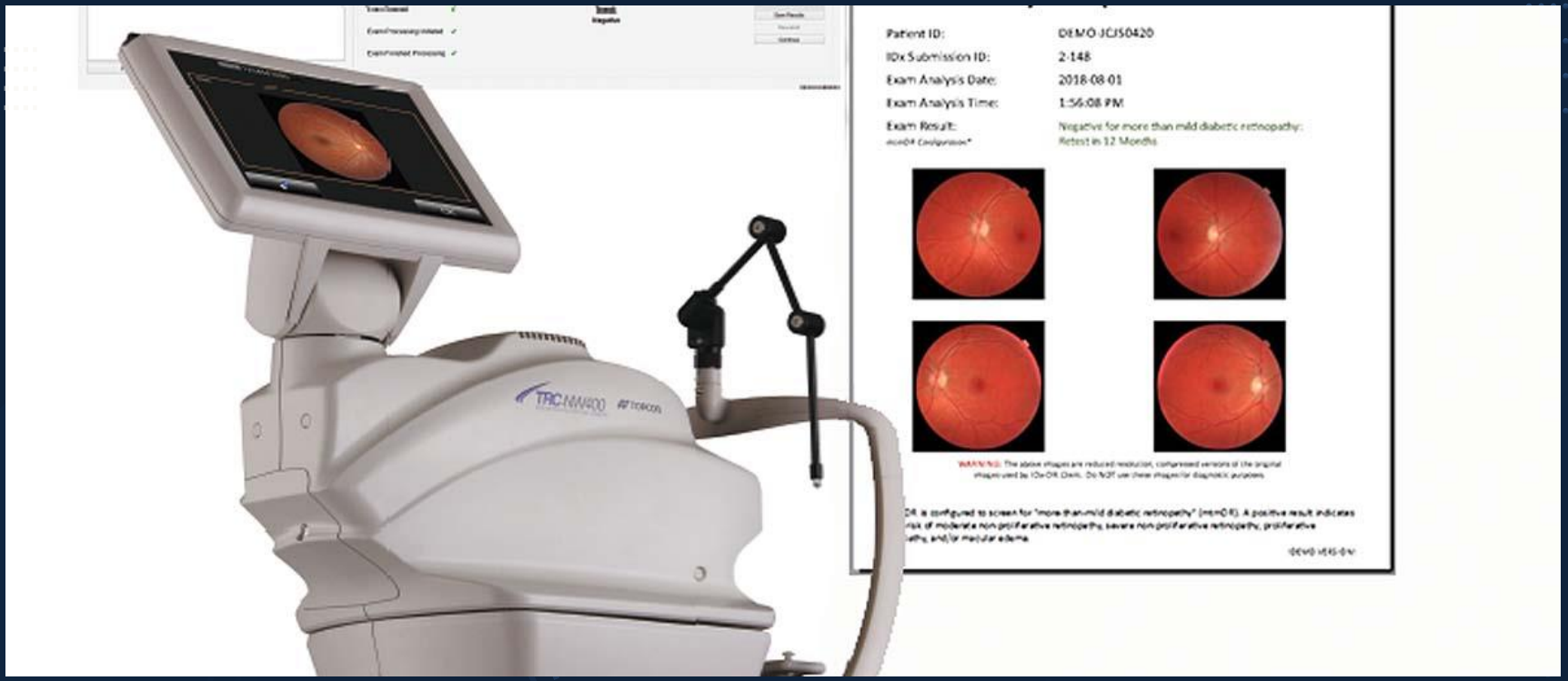
Pathology

- PathAI: assists with cancer cell detection in biopsy slides
- Improves consistency and reduces error rates

Genomics

TEMPUS: INTEGRATES SEQUENCING
+ CLINICAL DATA

HELPS ONCOLOGISTS MATCH
PATIENTS TO TARGETED THERAPIES



FDA Cleared Example: IDx-DR

- Autonomous AI for diabetic retinopathy detection
- FDA De Novo cleared in 2018
- High sensitivity (~87%), specificity (~91%)

Benefits and Limitations

Benefits: improved detection rates, reduced workload

Limitations: false positives, algorithm bias

AI augments radiologists and pathologists, not replaces them


Supporting Patient Care

Supporting Clinical Judgment

AI provides probabilities, alerts, and evidence-based suggestions

Reduces cognitive load by analyzing large datasets

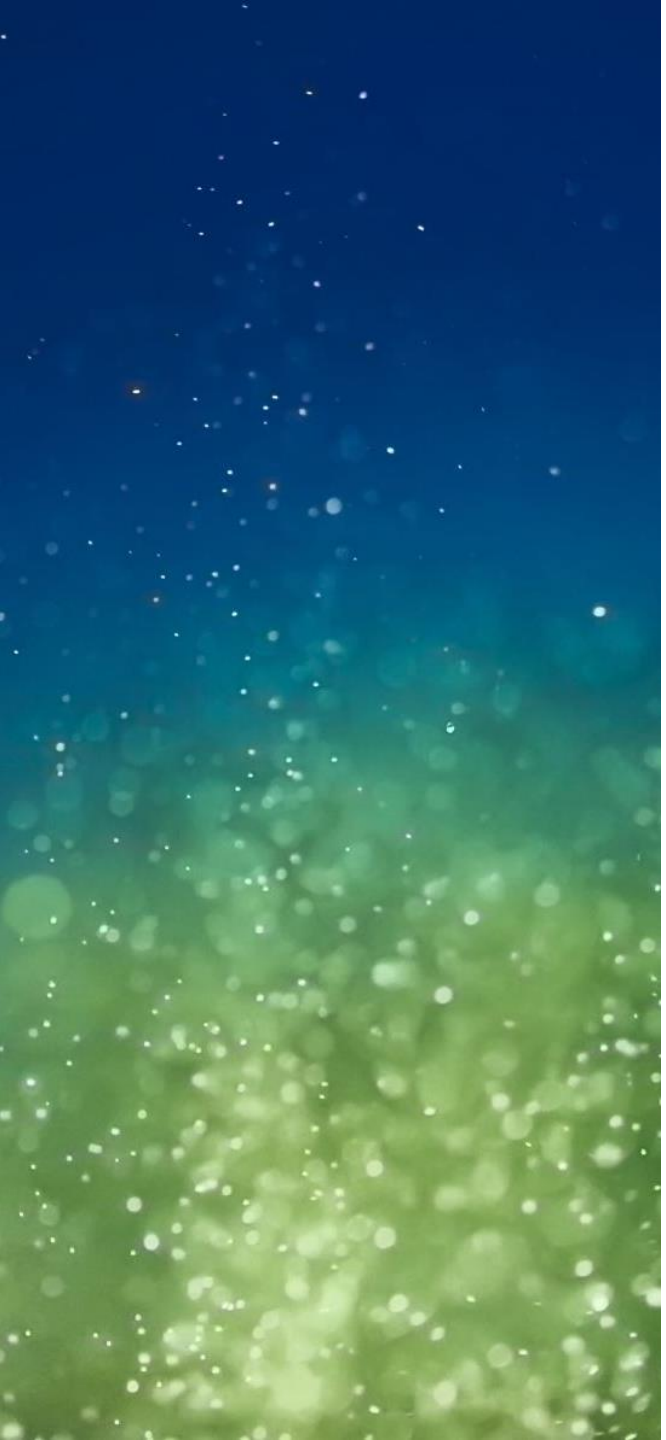
Highlights blind spots for clinicians to double-check

Enhancing Patient Interactions

AI reduces administrative tasks → more face time with patients

Translation tools improve communication across languages

Chatbots handle routine Q&A, clinicians focus on meaningful care



Promoting Compassionate Care

- Holistic insights: AI integrates lifestyle and medical data
- Continuous monitoring provides reassurance beyond hospital visits
- AI empowers patients to engage in their own care

Guardrails Against Burnout

By reducing clerical burden, AI protects clinician well-being

Frees clinicians to spend more energy on empathy and trust

Supports patient-centered and compassionate care delivery


Case Studies

Case Study 1: Breast Cancer Screening (MASAI)

Challenge: Radiology workload and missed cancers

AI triage system used in large trial (~80,000 women)

Compared AI+human vs traditional double reading

MASAI Trial Outcomes

44% reduction in radiologist workload

Cancer detection rates remained similar

Clinicians retained final decision authority

Case Study 2: Diabetic Retinopathy (IDx-DR)

Challenge: Access to eye specialists in primary care

IDx-DR provides autonomous AI results from retinal images

Approved by FDA in 2018

IDx-DR Outcomes

High sensitivity (~87%) and specificity (~91%)

Immediate results allow timely referrals

Clinicians deliver results and manage follow-up

Case Study3: Sepsis Early Warning (TREWS)

Challenge: Sepsis recognition often delayed

AI system monitors patient data continuously

Alerts clinicians to possible sepsis

TREWS Outcomes

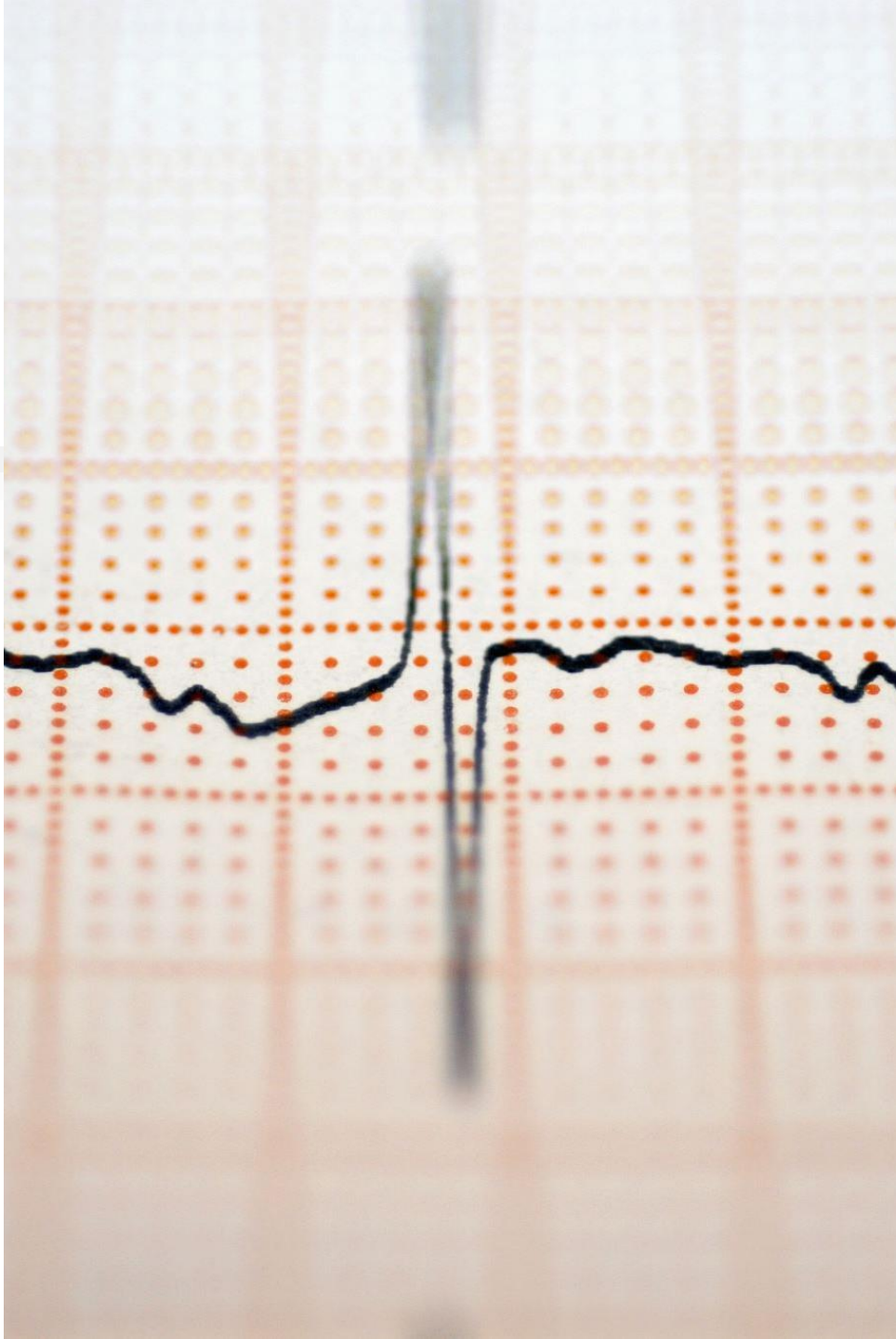
Multi-site study: 4.5% reduction in mortality

Improved early recognition and treatment initiation

AI prompts, but clinicians make treatment choices

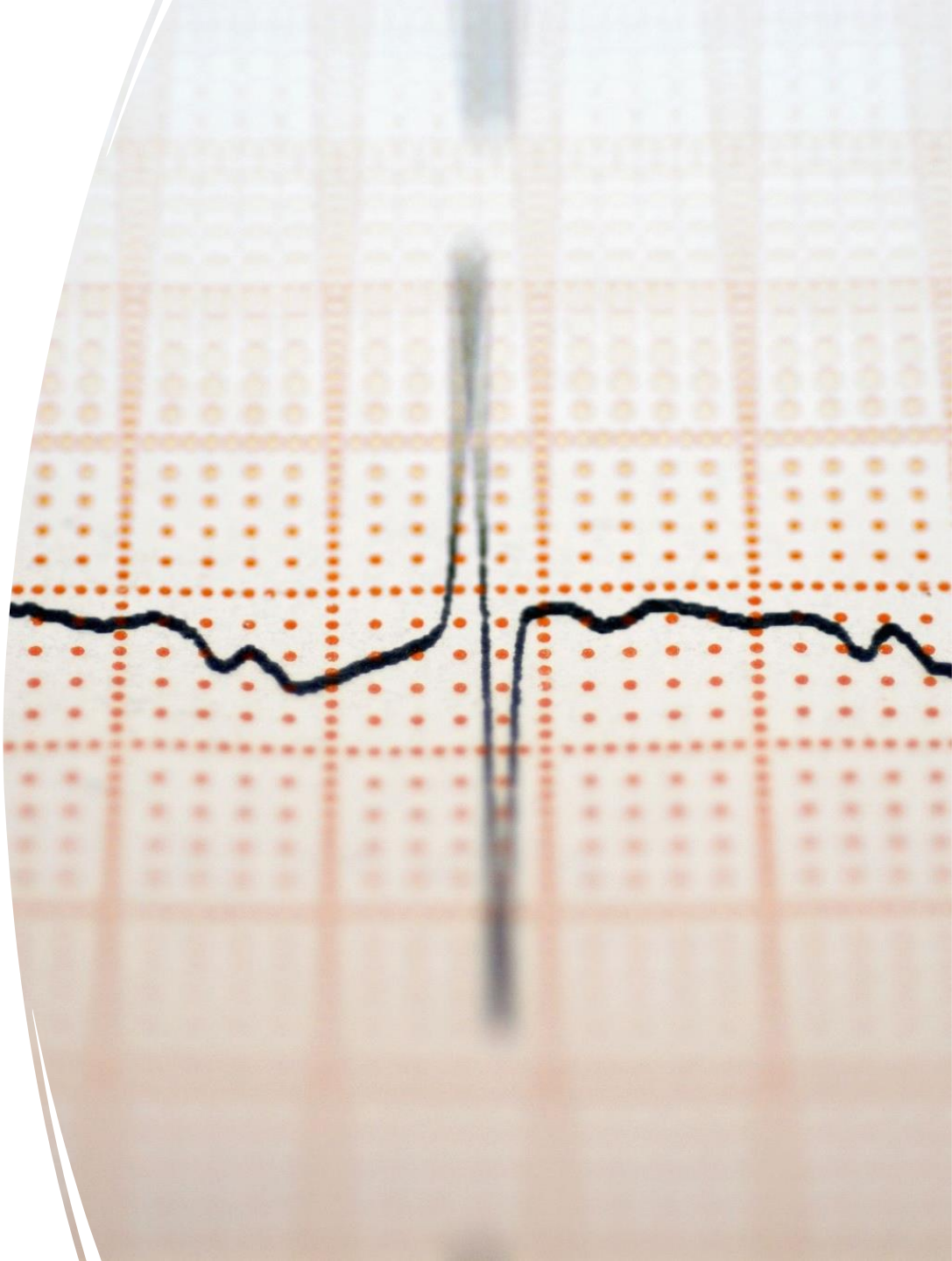
Case Study 4: Wearables (Apple Heart Study)

- Challenge: Detecting atrial fibrillation in large populations
- Apple Watch irregular pulse notification study (~419,000 participants)
- Participants notified if possible AF detected



Apple Heart Study Outcomes

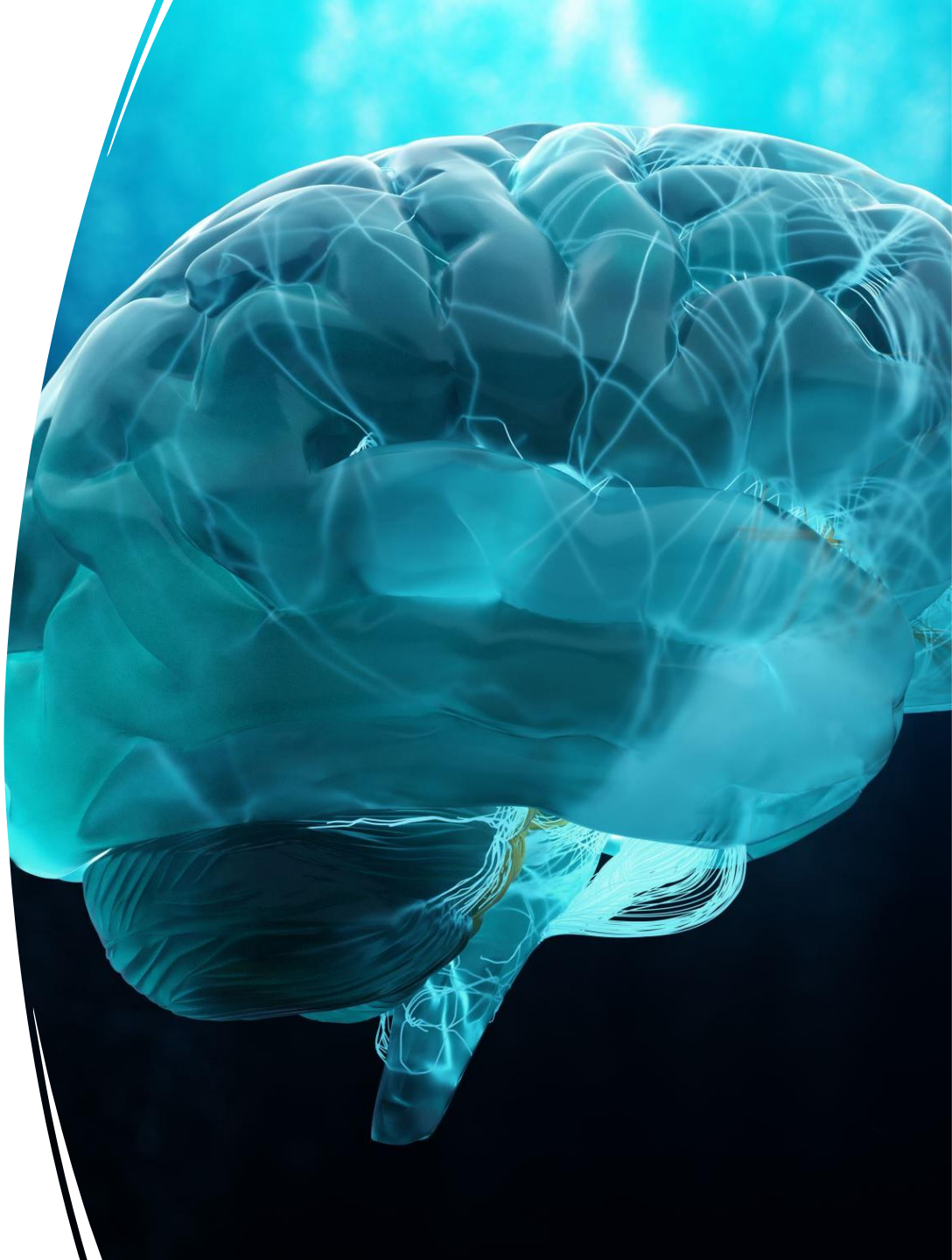
- 0.52% of participants received alerts
- ~34% had AF confirmed on ECG follow-up
- AI triage funnels patients to clinician confirmation



Challenges and Ethical Considerations

Bias & Fairness

- AI systems can inherit biases from training data
- Risk of perpetuating healthcare disparities
- Need for diverse, representative datasets



Privacy & Security

- AI requires vast amounts of patient data
- Risks of data breaches and unauthorized access
- Importance of HIPAA compliance and encryption

Accountability & Liability

Who is responsible when AI makes an error?

Legal frameworks for clinician vs AI accountability

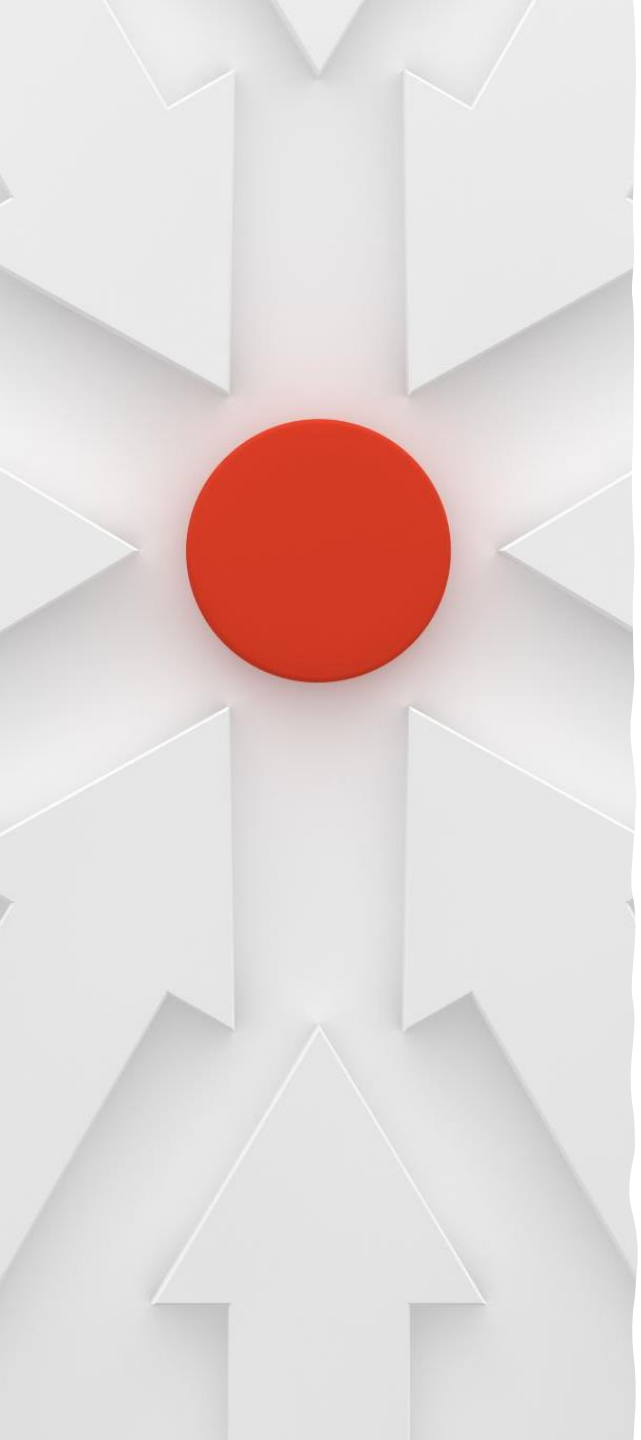
Need for clear regulations and guidelines

Trust & Adoption

Clinician skepticism: fear of replacement

Patients may not trust AI-driven decisions

Transparency and explainability are essential



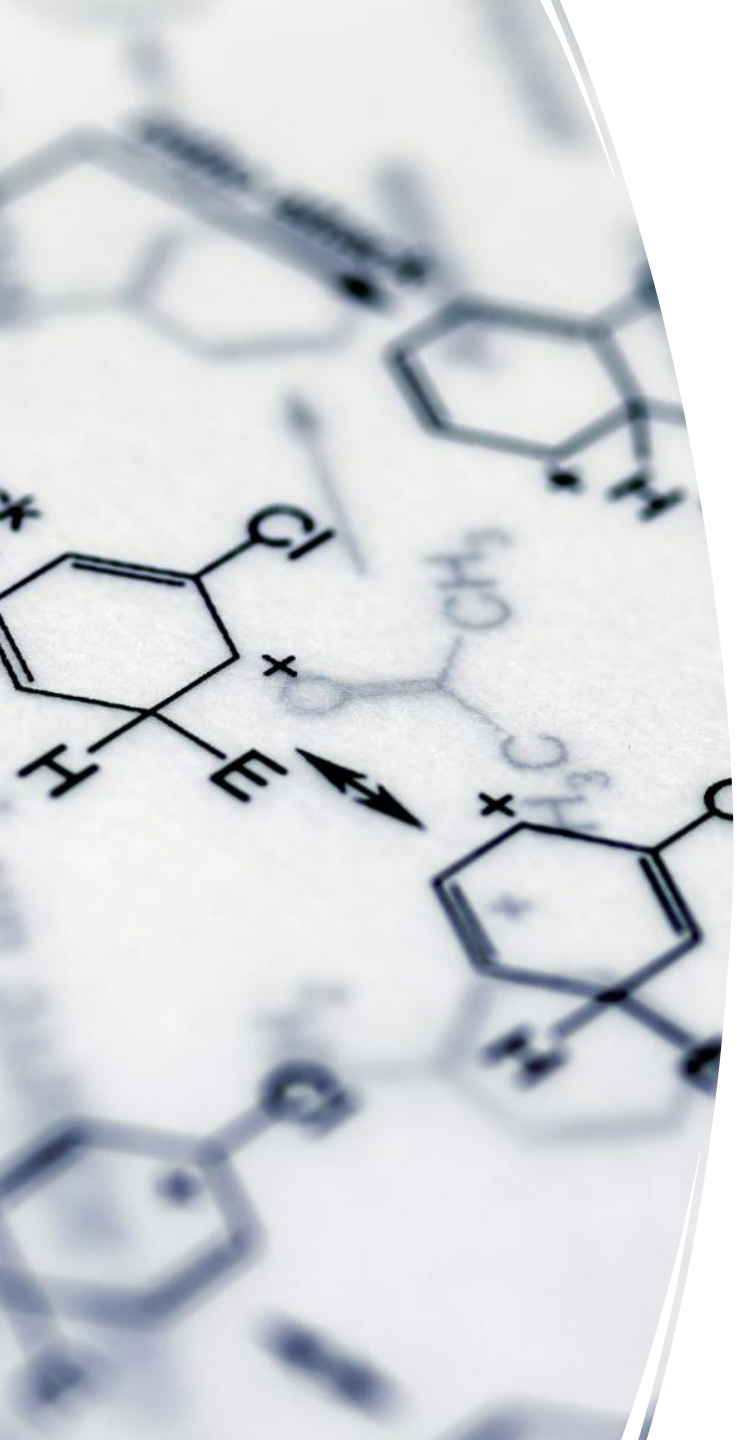
Future Directions

Digital Twins & Predictive Medicine

Creating digital replicas of patients for simulation

Allows testing of treatments virtually before real-world application

Personalized medicine at scale



Generative AI in Healthcare

- Drug discovery and design using AI models
- Automating clinical documentation with natural language generation
- Patient education materials tailored by AI

Regulatory Trends

FDA advancing guidelines for AI/ML-based medical devices

EU AI Act shaping standards for safety and transparency

Global momentum toward responsible AI in healthcare

Conclusion

AI is transforming healthcare across diagnostics, planning, workflow, and monitoring

Case studies show AI augments, not replaces, clinical expertise

Supporting compassionate, patient-centered care remains essential

Future: digital twins, generative AI, evolving regulation

Questions??

Follow Up:

- Sheila Dolbow, MSN, CFN, CPHQ
- Quality Improvement Project Manager
- Texas Hospital Association Foundation
- sdolbow@tha.org


THANK
YOU!

Next Steps:

Watch for an email from cahqi@thafoundation.org

Instructions and passcode for portal will be attached

Complete the evaluation

Download your certificate

Please provide feedback!! We love getting your suggestions!!

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