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Leveraging AI to Mitigate Operational Risks in Rural Healthcare

June 3, 2025

About HealthDox

HealthDox

25 years experience

ASHRM HCCA Health Care Compliance Association

Member of
ASHRM & HCCA

AI

AI Analytical
Services

IT

GRC
Solutions

Certified Auditors
IT Consultants

Agenda

1. Challenges, AI
2. Gen AI / Agentic AI
3. The Past
4. The Transition
5. The Present
6. The Future
7. The Journey

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Challenges

AI

Key challenges in Rural Healthcare

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Limited Staff & Specialists

Overburdened personnel increase the risk of delays and errors

Resource Constraints

Budget limitations restrict access to advanced monitoring or infrastructure

Data Gaps

Incomplete clinical and operational data due to fragmented systems

Artificial Intelligence

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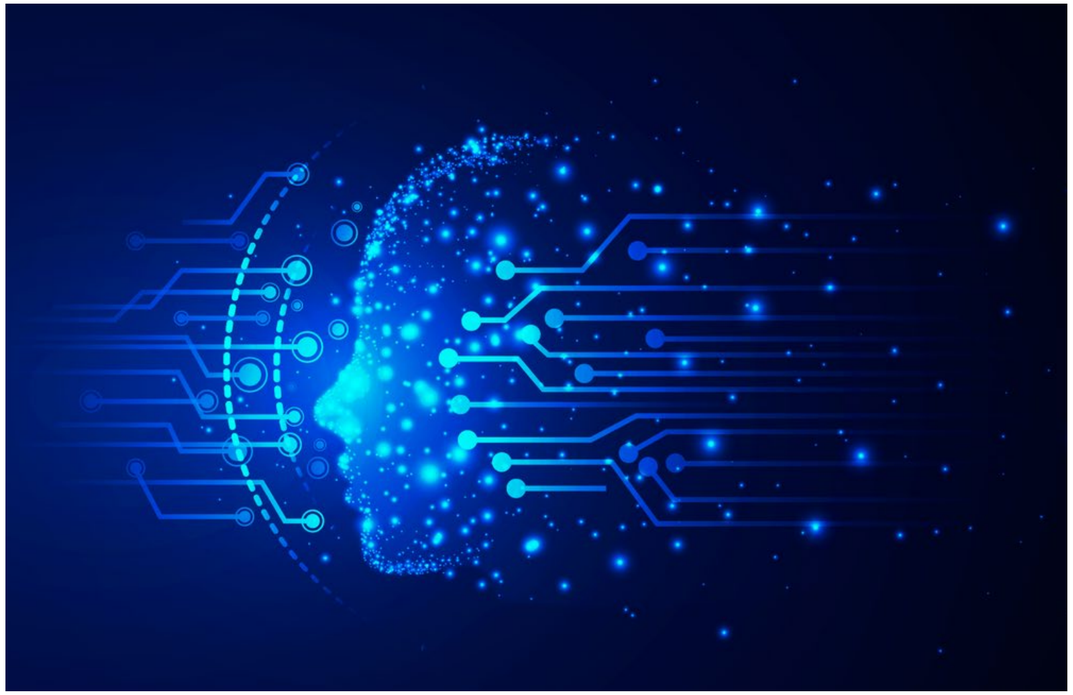
Simulates human cognition in machines.

CAPABILITIES

- **Reasoning**
- **Learning**
- **Perception**
- **Languages**



Benefits of AI in Healthcare

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- Improved diagnostic accuracy
- Reduced clinician burnout
- Accelerated decision-making
- Cost reduction and efficiency

Challenges and Risks

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- Data privacy and HIPPA compliance
- Bias and fairness in algorithms
- Integration with legacy systems
- Regulatory and ethical concerns

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Generative AI
Agentic AI

Generative AI

Creates new content like Text, Images, or Audio.

Examples

- ChatGPT
- Medical Transcription
- Synthetic Data

Uses in Healthcare

- Documentation
- Education
- Decision Making

Agentic AI

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Acts autonomously to achieves goals.

Traits

- Decision Making
- Planning
- Adaptability

Uses in Healthcare

- Smart Triage
- Patient Interaction
- Automation

Generative AI in Action

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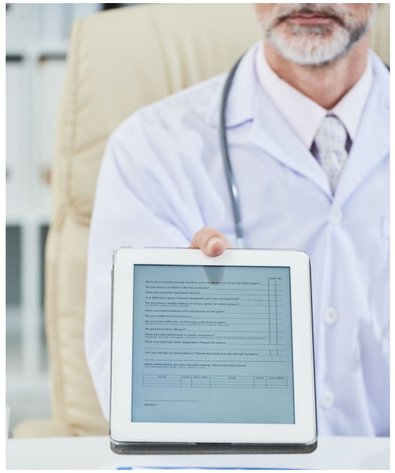
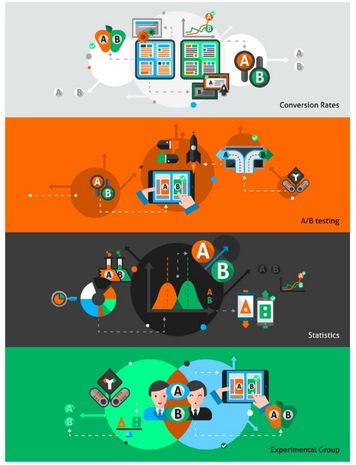


Auto generation of clinical notes

Chatbots for patient engagement



Synthetic data for research and training

Today’s AI Environment

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Gemini

Google DeepMind
Eye Disease Detection

Nuance DAX
Real-time Clinical Documentation

Aidoc
AI-Driven Radiology Alerts

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The Past

The Turing Test & AI

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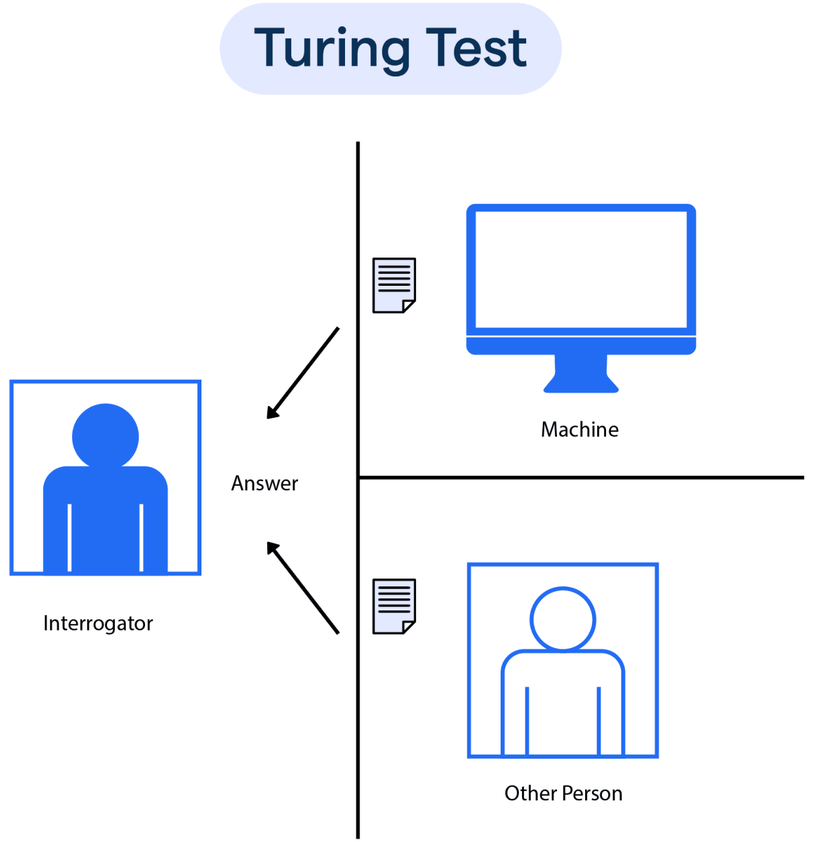
- Proposed by Alan Turing to assess machine intelligence.
- A machine passes if indistinguishable from a human in conversation.
- Relevant for chatbots and healthcare assistants.



Expert Systems

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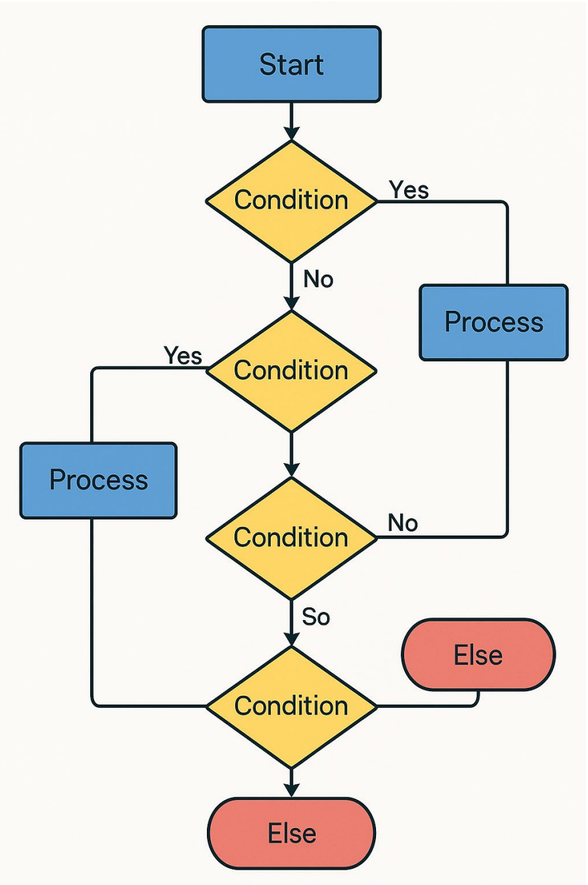
- Rule-based systems mimicking human decision-making.
- Used in early diagnostic tools with 'if-then' logic.



Limited adaptability but laid the foundation for AI in healthcare.

Humans and the Drive to Automate Work

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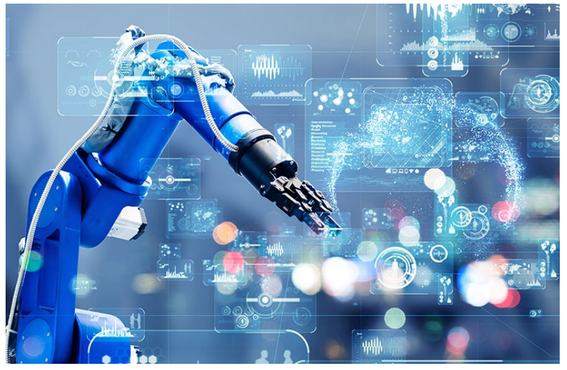
- From industrial automation to smart robotics.
- AI follows this legacy by automating intellectual labor.



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The Transition

AI the Transition Example

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OCR:

Gateway to AI

- Old: Template matching, Fixed fonts.
- New: Deep learning, Handwriting recognition.

Healthcare Application Example

Used in digitizing medical records and claims.

AI the Transition – Behind the scene

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Storage Affordable

- Storage costs reduced
- Advances in storage technologies

GPUs Outpaced CPUs in AI

- GPUs enable parallel processing for large datasets.
- Essential for training deep learning models.

Cases – AI in Healthcare

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WebMD:

WebMD health services

Democratizing Health Information

- Provided patients access to medical info online.
- Popularized symptom checkers and health literacy tools.

2

IBM Watson in Oncology

IBM Watson

- Used NLP to digest clinical literature and recommend treatments.
- Pioneered AI-assisted decision-making in hospitals.

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The Present

AI vs Machine Learning vs Deep Learning

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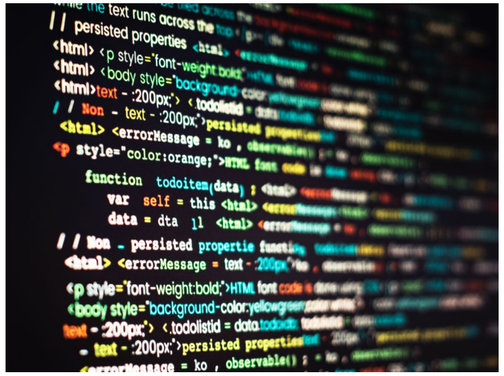
AI

Broad field simulating human intelligence

VS

Machine Learning



Algorithms learning from data

VS

Deep Learning

Neural networks for data-based decisions

Infrastructure for LLMs

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- High-performance GPUs (e.g., A100s)
- Massive datasets
- Distributed training clusters

Understanding AI Models: Focus on LLMs

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- LLMs use massive datasets to generate language.
- Examples: GPT-4, Gemini, Claude.

Claude

Gemini

How ‘Deepseek‘ changed the playing field

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- Symbolizes general-purpose AI systems.
- Adapts in real time to unseen situations.

Transhumanism

Extensive learning of life-long lessons

Transferring human consciousness into a machine

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The Future

The Future of AI in Healthcare

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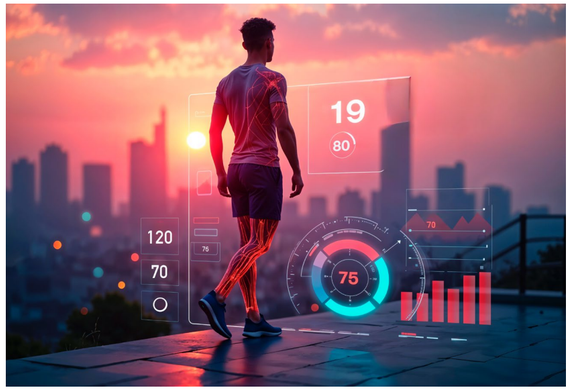
AI-assisted Robotic Surgery

Real-time Data Integration for Personalized Care

Population Health Prediction and Management



Nurse AI Robots

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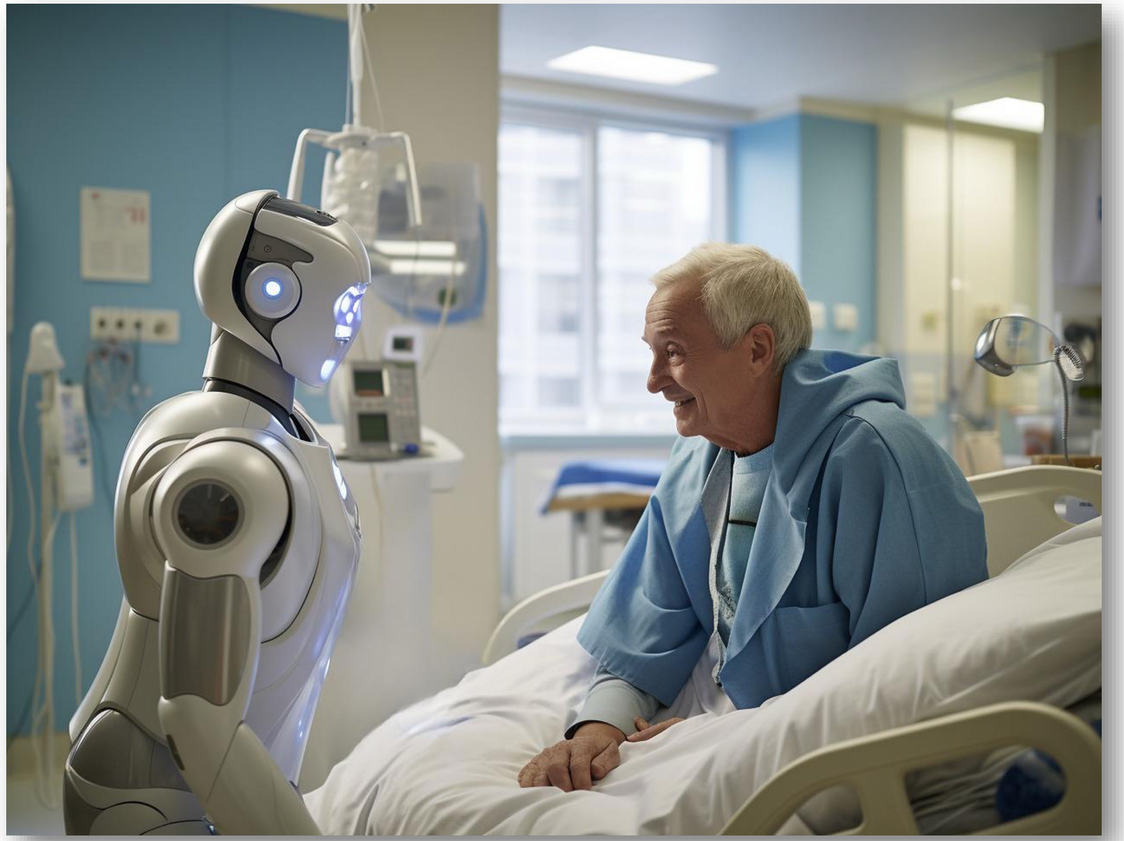
- Support routine nursing tasks and patient monitoring.
- Vital sign monitoring and alerts
- Medication delivery
- Patient interaction and support
- Reduces staff workload and increases safety



AI Robots Learning to Play Soccer

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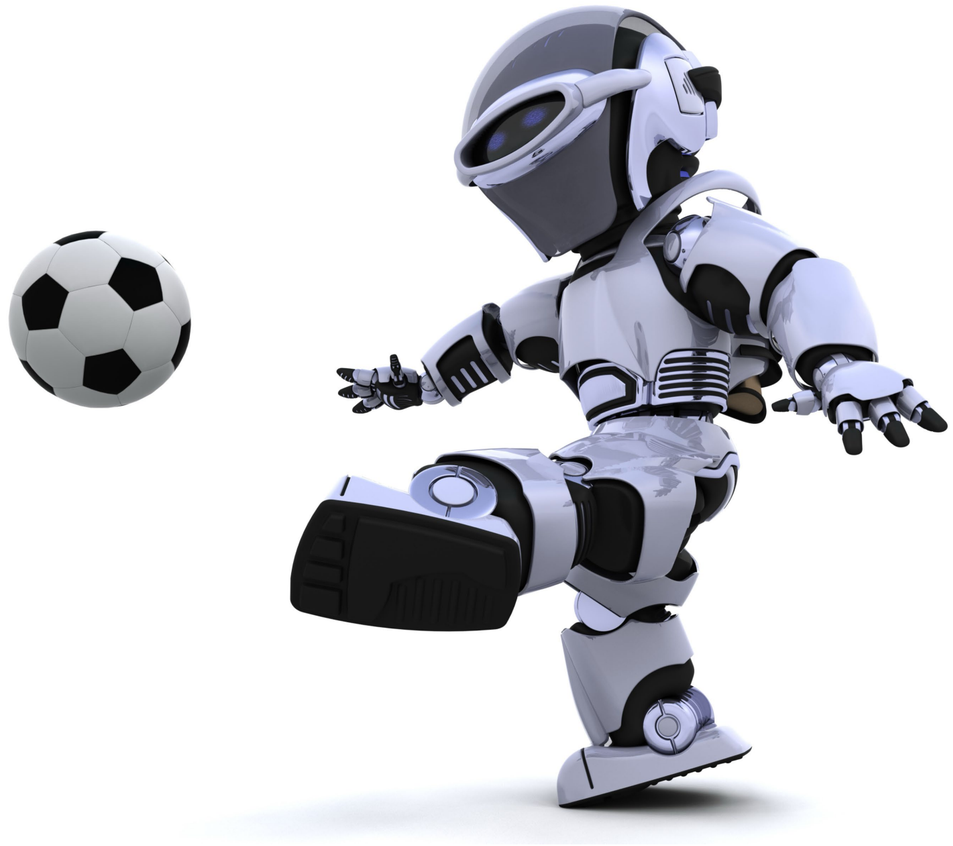
- Learn teamwork, strategy via reinforcement learning.
- Impressive coordination without explicit programming.



Applications in Healthcare

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Communication

AI Chatbots

Analysis

Diagnostic Assistance

Office

Documentation

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The Journey

Getting Started with AI

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- Evaluate data quality and infrastructure
- Identify practical pilot projects
- Involve cross-functional teams early
- Plan for change management

AI Applications in Healthcare

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- Medical Imaging Interpretation
- Predictive Analytics & Risk Scoring
- Virtual Health Assistants & Chatbots
- Compliance Document Automation
- Administrative Task Automation

Risks of AI in Clinical Decisions

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- Errors due to bias or opaque logic
- Legal liability, regulatory scrutiny
- Black-box models
- Overreliance on automation

AI in Administrative Operations

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- Auto-documentation
- Smart Scheduling
- Claim Automation
- Chatbots for FAQs

AI Helps Mitigate Risks

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Limited Staff & Specialists	Resource Constraints	Data Gaps
Overburdened personnel increase the risk of delays and errors	Budget limitations restrict access to advanced monitoring or infrastructure	Incomplete clinical and operational data due to fragmented systems
Intelligent Triage & Decision Support	**Predictive Maintenance for Equipment & Supplies**	**Automated Compliance & Risk Reporting**
AI tools prioritize high-risk cases and support clinical decisions with limited staff	ML models forecast equipment failures before they impact care	AI flags operational risk exposures (e.g., predict incidents before they occur)

Summary

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- AI is revolutionizing healthcare delivery.
- Generative and agentic AI unlock new frontiers.
- Successful adoption requires tech, people, and process alignment.

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Thank you!

Any Questions?

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