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The Healthcare AI Landscape: Opportunities and Challenges

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COMPLEXITY

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We must ease the burden of clinical practice

- Healthcare has seen an explosion in clinical evidence, capabilities, and a drive for vastly improved clinical outcomes over the past 20 years.
- While complexities of practicing medicine have grown exponentially, we have not seen advancements in the tools and processes to keep up until recently.
- Today we are at a pivotal point in healthcare with rapid advancement of tools and process that will fundamentally support clinical care in a more effective way.

Types of agents transforming various industries

Basic agents

Designed to perform a single task in a confined environment such as answering questions, translating languages, or generating summaries of text.

Examples: Customer service (FAQs, weather updates, etc.)

Copilots

Copilots work collaboratively with users assisting them in specific tasks, understanding context, adapting to user preferences, and providing recommendations.

Examples: Code generation, creative writing, etc.

Autonomous agents

Goal oriented agents capable of performing complex tasks in dynamic environments in a self-directed fashion.

Examples: Trading agent that can buy and sell stocks

Adaptive agents

Capable of introspecting & analyzing their performance and continuing to learn and improve their capabilities over time.

Examples: Research agent, smart home automation, etc.

Multimodal agents

Support multimodal perception and fusion across modalities like vision, language sound, etc. for cross-model reasoning and context-aware responses.

Examples: Self-driving cars, assistive robots, etc.

Social agents

Adept at recognizing social cues and emotional nuances, they adapt their responses for meaningful conversations and build strong relationships.

Examples: Virtual companions, counseling/therapy agents, etc.

AI use cases in healthcare seem unlimited…

- Ambient DigitaScribel (U.S.)
- Augmenting Data Analysis and Interpretation
- Automating Patient Care Navigation
- Auto-generating Clinical Documentation
- Auto-composing Clinical Messages
- Medical Literature Discovery
- Autonomous Clinical Coding
- Automating Outbound Healthcare Consumer Messaging
- Healthcare Consumer Language Translation
- Auto-generating Personalized Patient Education Materials
- Clinical Condition Diagnosis
- EHR Search and Summarization
- Automating Clinical Trial Patient Identification
- Auto-generating Differential Diagnosis ?and Treatment Plan
- Autonomous Virtual Primary Care
- Healthcare Administrative Assistant
- Clinician Performance Analysis
- Auto-generating Patient Health Summaries
- Clinical Encounter Simulation

Generative AI risks

Social bias

Foundation models can expose performance disparities across demographic groups, their predictions can enforce stereotypes, or create offensive content.

Privacy

Terms of use could lack clarity on the usage of user interaction data for model improvement which can raise privacy concerns.

Disinformation

Foundation models can fabricate content and produce fluent and persuasive text that can be used by malicious actors.

Legal considerations

Foundation models could be trained on copyright/protected data and could be liable for copyright violation.

Security

Foundation models are vulnerable to data poisoning attacks based on their training data being compromised. In addition, models are vulnerable to “jail-breaks” and prompt-injection attacks which can cause it to generate harmful or misleading content.

Quality and reliability

Foundation models can fail to produce the correct answer. At times, human review could be essential to assess output quality which can vary due to the model’s unpredictable nature. The models may also hallucinate which could result in errors and have other significant implications.

Preparing for an AI Journey

Balancing risk

There will always be some risk – need to balance risk with value. Start with low risk/high value areas.

Governance

Governance needs to be in place - security, privacy, regulation aspects, data bias, transparency, explainability.

Are you ready to drive the change management?

Need to drive workflow changes, new processes, support from the top management, advocacy from physician champions.

Are you committed to driving sustainable user adoption?

Driving adoption takes more than technology – training programs, building user interfaces aimed at delighting your users, alignment with incentives.

Does your Cost Utility Assessment demonstrate solid ROI?

Taking into account clinical and financial consequences of false positives and negatives, do you expect significant impact?

Are you solving prioritized pain points for your providers and pateints?

Time to Value - Can you deliver tangible value within months of implementation vs. years?

Automation of administrative tasks

(Live today at Presbyterian)

- AI identification of gaps in care with outreach and self-scheduling
- AI facilitated prior authorization
- AI medication adherence identification and outreach
- AI identification of incidental findings where follow-up may have not occurred

Automation of documentation and decision support

- Ambient listening (pilot)
- AI-assisted In-Basket responses (Live)
- Clinical Co-pilot at POC
- Clinical Co-pilot knowledge
- Clinical Co-pilot messaging

What can we impact together?

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Thank You