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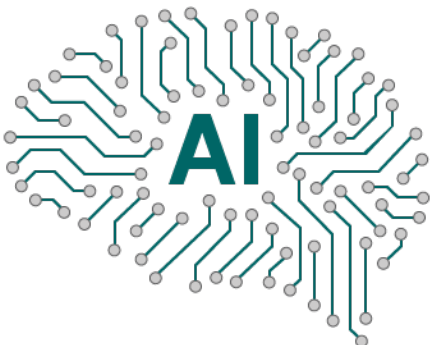


Using A.I. in Long-Term Care: Innovation, Ethics, & Impact

Christopher Owens, PharmD, MPH
Kasiska Division of Health Sciences
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IHCA Annual Convention

July 9, 2025



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Conflict of Interest Disclosure

The presenter has no relevant financial relationships with commercial interests to disclose in connection with this presentation.

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Learning Objectives

1. Describe current and emerging uses of artificial intelligence (AI) in long-term care (LTC), including clinical support, predictive analytics, and virtual care solutions
2. Identify key ethical concerns related to AI implementation in LTC, including issues of trust, transparency, data privacy, and potential bias
3. Engage in interactive case-based discussion on how LTC administrators and clinicians can critically assess AI tools for practical, ethical integration



“The future is a race between the growing power of technology and the wisdom with which we use it.”

– Stephen Hawking (Astrophysicist)



“A.I. will not replace humans, but those who use AI will replace those who don’t.”

– Ginni Rometty (Former CEO of IBM)



“A.I. will be integral to solving the biggest problems we face but must be developed in ways that reflect human values.”

–Satya Nadella (CEO of Microsoft)

Presentation Outline

1. Introduction (10 min.)
2. Background and Basics of A.I. (10 min.)
3. General Healthcare Applications (10 min.)
4. Ethical Considerations (20 min.)
5. Long-Term Care Applications (30 min.)
6. Q&A (10 min.)



**How confident are you in
your understanding of A.I.
and its healthcare
applications?**



Overall, how do you feel about the role of A.I. in long-term care?



**In your facility or system,
what is the stage of A.I.
adoption?**

Introduction

“The world stands on the brink of a technological renaissance, with Artificial Intelligence (A.I.) at its epicenter. Its transformative waves are felt across sectors, and healthcare is no exception. The integration of A.I. within the medical realm represents a monumental leap in the evolution of care delivery. This fusion promises not just enhancements in diagnostic accuracy and therapeutic interventions, but a complete reimaging of healthcare paradigms.”



ChatGPT

--Response by ChatGPT on Sept 9, 2023 to the prompt:
“Provide a brief preamble to a discussion of the role of A.I. in healthcare”

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On Artificial Intelligence

Lewis Thomas, M.D.

February 28, 1980

N Engl J Med 1980; 302:506-508

DOI: 10.1056/NEJM198002283020906

Print Subscriber? [Activate your online access.](#)

The most profoundly depressing of all ideas about the future of the human species is the concept of artificial intelligence. The ambition that human beings will ultimately cap their success as evolutionary overachievers by manufacturing computers of such complexity and ingenuity as to be smarter than they are, and that these devices will take over and run the place for human betterment or perhaps, later on, for machine betterment, strikes me as wrong in a deep sense, maybe even evil.

This article is available to subscribers.

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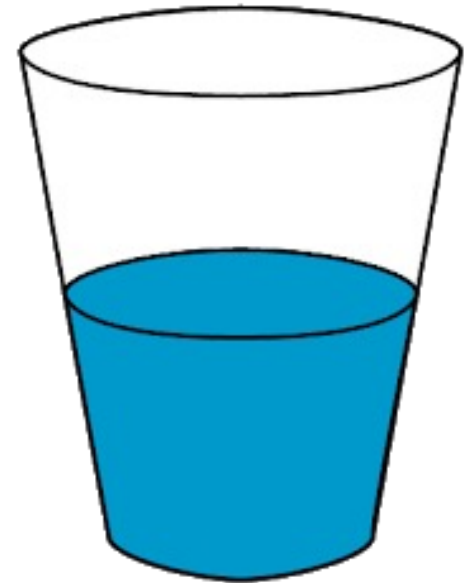


Related Articles

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AI: Promise or Peril?

- Full integration of AI into healthcare will have major implications on biomedical research and practice, as well as healthcare delivery with applications in many areas:
 - Diagnostics
 - Treatments
 - Patient Management
 - Healthcare Operations
- We will discuss specific examples and ethical implications in this presentation, with an emphasis on LTC



AI is REVOLUTIONARY

- Like other technological advancements – fire, the wheel, electricity, steam engines, computers, the Internet – AI has the potential to revolutionize human life and lifestyle
 - Will be a catalyst for progress
 - Foster dependence and “de-skilling” in users
 - Have wide-ranging impacts on human culture and civilization
 - Must be developed with CARE
- Both positive and negative effects...



<https://mindmatters.ai/2022/07/if-ai-is-like-fire-lets-not-get-left-with-its-ashes/>

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Ethical Implications

- AI's ability to learn, improve, and perform functions that only humans have hitherto been able to do creates opportunities and challenges
 - The domain of healthcare is deeply human and so integrating *artificial* intelligence is potentially concerning
 - Healthcare professionals and administrators are ALREADY confronted with numerous ethical and practical dilemmas brought on by the nature of healthcare itself and technological advances of many kinds
 - In such a dynamic landscape, understanding A.I.'s potential and ethical implications is critical

Generative AI Tools

Content Creation



Scribe



ChatGPT



Copy.ai



Jasper



Claude



Cohere



Gemini



Bard



Research
Rabbit

Design & Visual Arts



DALL-E 2



Midjourney



Adobe
Firefly



Canva AI

Coding & Development



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AlphaCode



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Synthesia



Auto-GPT



Audiovisual
AI



Elicit

TURING

<https://www.turing.com/resources/generative-ai-tools>

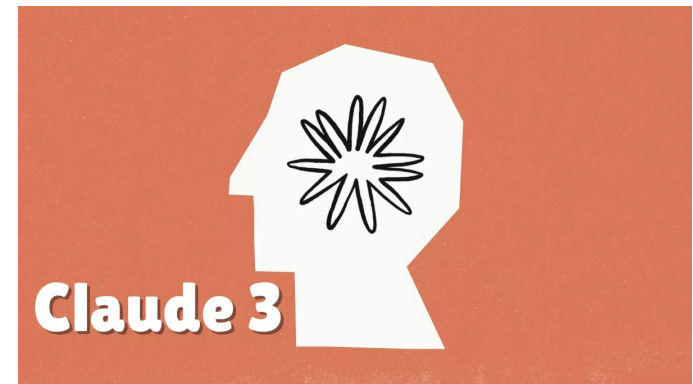
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Generative AI platforms



Gemini



ChatGPT



Do you use a generative AI tool in your work or personal life?

① The Slido app must be installed on every computer you're presenting from

slido



If you use AI, what do you use it for?

① The Slido app must be installed on every computer you're presenting from

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Artificial Intelligence

A very brief history and overview

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What is Artificial Intelligence?

- Artificial Intelligence (AI) refers to the simulation of human intelligence by machines
- Involves the ability of machines to perform tasks that typically require human intelligence, such as problem-solving, learning, and decision-making
- AI systems aim to mimic human cognitive functions, including reasoning, problem-solving, learning, and perception

• REACTIVE

Spam Filters
Chatbots
Recommendation engines from Spotify or Netflix

THEORY OF MIND

Understands the needs of other intelligent entities



4 Types of AI

• LIMITED MEMORY

Generative AI tools (e.g. ChatGPT)
Self-driving cars
Virtual assistants

SELF-AWARE

Evolved to have human-like intelligence and self awareness

Narrow AI

Exists today

Strong AI

Only exists as a concept or theory



What type of AI is ChatGPT?



ChatGPT is primarily an example of **Narrow AI**, also known as **Limited Memory AI** or **Weak AI**. This type of AI is designed for specific tasks and lacks general intelligence. ChatGPT is specifically tailored for natural language understanding and generation tasks, making it proficient in text-based conversations, answering questions, and generating human-like text responses.

It operates based on pre-trained language models and extensive data, allowing it to perform exceptionally well in its designated task but without possessing a broader understanding of the world or context. ChatGPT doesn't have self-awareness, consciousness, or the ability to think beyond the scope of the text-based input and output it handles, which are characteristic limitations of Narrow AI.



(or Stages)

Three types of Artificial Intelligence

	Artificial Narrow Intelligence (ANI)	Stage-1	Machine Learning	Specialises in one area and solves one problem
				
	Artificial General Intelligence (AGI)	Stage-2	Machine Intelligence	Refers to a computer that is as smart as a human across the board
				
	Artificial Super Intelligence (ASI)	Stage-3	Machine Consciousness	An intellect that is much smarter than the best human brains in practically every field

ChatGPT prompt on June 4, 2025:

How close are we to self-aware AI?

We're not close to creating genuinely self-aware AI—at least not in any scientifically accepted or testable sense of the term. Here's a breakdown of why:

What Do We Mean by "Self-Aware" AI?

There are a few levels of "awareness" or "consciousness" often discussed:

1. **Reactive AI** – responds to inputs without memory (e.g., Deep Blue).
2. **Limited Memory AI** – like ChatGPT or image classifiers; uses historical data but doesn't have a continuous sense of self.
3. **Theory of Mind AI** – would understand emotions, beliefs, and intentions of others.
4. **Self-Aware AI** – would have consciousness, subjective experience, a sense of identity.

We're somewhere between #2 and a primitive form of #3—at best.

Why Aren't We There Yet?

1. We Don't Understand Consciousness

- Neuroscience and philosophy have no unified theory of how consciousness arises. Without knowing what *causes* awareness, we can't replicate it.

2. Current AI is Symbolic or Statistical

- Systems like ChatGPT work by predicting text, not by understanding it. They lack any internal model of "self" or an enduring mind.

3. No Persistent Internal State

- AI has no memory of past interactions unless manually programmed. Even with memory, there's no internal narrative or continuity of experience.

4. No Intentionality or Motivation

- AI doesn't "want" anything. It performs tasks because it was designed or instructed to, not from desire or self-preservation.



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A.I. in Health Care

There is a wide range of uptake, but it's increasing...

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The Promise of A.I. in Healthcare



- Diagnostics
 - AI algorithms can sift through massive data sets, including images, to discern patterns imperceptible to the human eye, leading to earlier diagnosis and predict possible outcomes
- Treatments
 - Similar techniques can be applied to the process of drug discovery, accelerating the identification and testing of potential new therapies
- Healthcare operations
 - Data analysis can also make operations more efficient and precise, inform better staffing models, improving patient outcomes, and reducing costs

Improved Diagnostics

- Advanced deep learning models are revolutionizing radiology by enhancing and speeding up the process of image analysis
- AI can also categorize and prioritize scans, ensuring that critical cases get immediate attention
- Models can:
 - Interpret chest x-rays/assist in endoscopy
 - Detect cancer in mammograms or MRIs
 - Predict Alzheimer's disease in PET scans
 - Detect cardiac anomalies
 - Identify suspicious skin lesions
 - Help in the diagnosis of conditions like autism



Improved Treatment

- AI can expedite the time-consuming and expensive process by quickly and accurately analyzing large numbers of complex biochemical structures and interactions
 - AI models have classified various proteins as potential drug targets for various cancers and have identified both novel cancer targets and site-specific gene targets
- “Digital Twins” to simulate patient responses in virtual clinical trials

<https://www.utoronto.ca/news/u-t-scientists-use-ai-fast-track-drug-formulation-development>

Improved Operations

- AI may be used in a variety of areas in hospital and clinical settings to improve care delivery and the patient experience
- May improve adherence to therapies and decrease hospital re-admission rates
- Useful for streamlining and increasing the accuracy of many administrative activities:
 - Coding, billing, and claims
 - Prior authorizations and payment
 - Scheduling and staffing



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Ethics of A.I.

Using this new technology wisely

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**What are your top 3
ethical concerns about
the use of A.I. in
healthcare settings?**

The Ethics of A.I. in LTC

- Ethical challenges have always been a part of healthcare, but are often amplified when considering vulnerable populations
 - Ethics should not be viewed as a barrier to innovation, rather as the necessary foundation of trust for any innovation
- Healthcare leaders and administrators must be able to engage with AI proactively and wisely and help their teams to do likewise



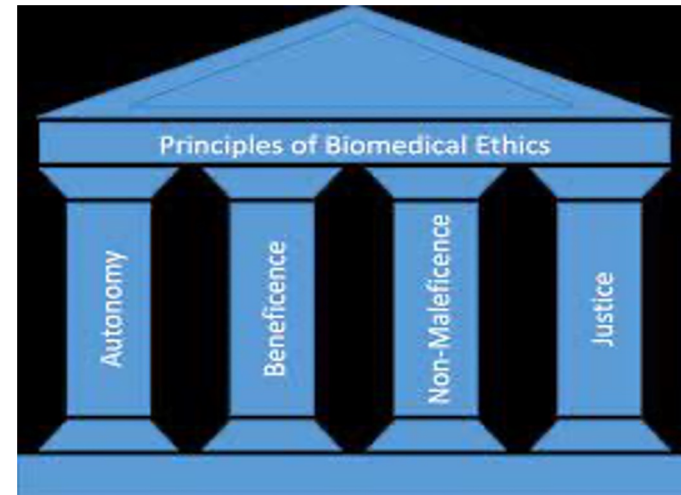
Major Ethical Questions

- How will patients' autonomy and dignity be protected?
- How can security of data be maintained and privacy and confidentiality be ensured?
- Can AI decisions be explained and trusted?
- Who is accountable when AI fails or causes harm?
- How can we realize the benefits of efficiency but retain compassion and the “human” side of caring for people in healthcare settings?

Bioethical Principles

- All professional codes of ethics emphasize the following basic bioethical principles:

- **Nonmaleficence**
- **Beneficence**
- **Justice**
- **Respect for autonomy**
- **Confidentiality**
- **Fidelity**
- **Veracity**

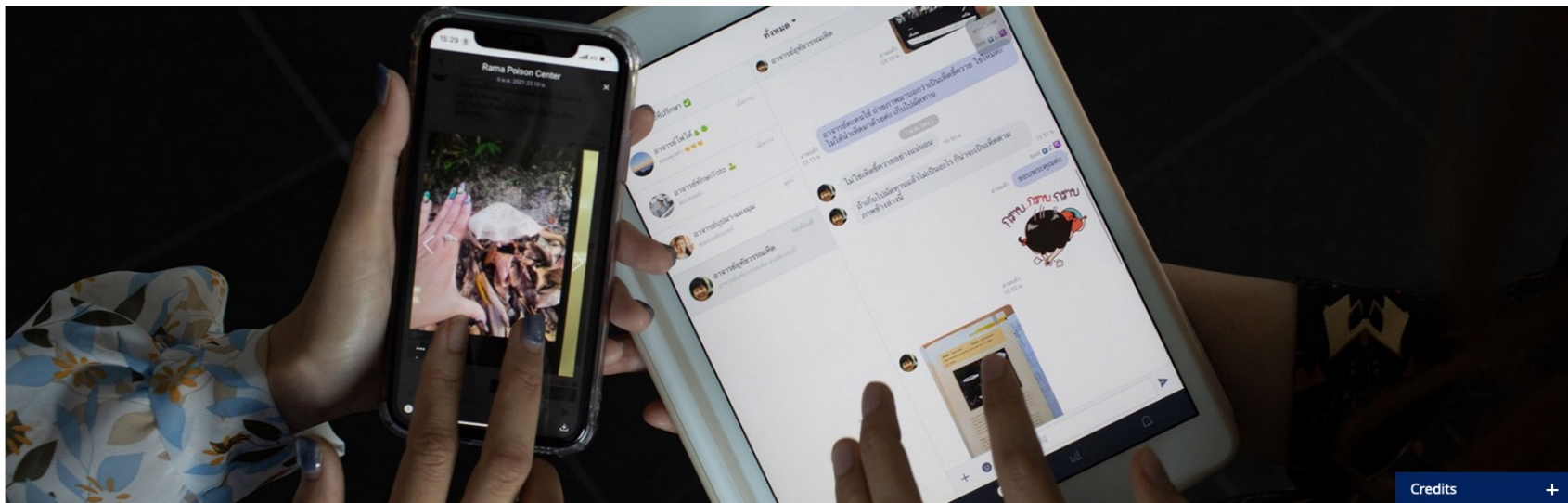


- These have application when dealing with technological issues in healthcare, including AI

Varkey B. Principles of Clinical Ethics and Their Application to Practice. Med Princ Pract. 2021;30(1):17-28.

Each of these ethical principles has application in the emerging field of AI

Home / News / WHO calls for safe and ethical AI for health



WHO calls for safe and ethical AI for health

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The WHO's Six Principles

1. **Autonomy**: human control and decision-making
2. **Beneficence**: ensuring positive health outcomes
3. **Justice**: fair access to technology and prevention of potential bias
4. **Explainability**: AI systems must be understandable
5. **Accountability**: Humans must remain responsible
6. **Sustainability**: long-term effectiveness and equity

Autonomy

- Use of AI can lead to situations in which decision-making power may be transferred to machines
 - ***However, humans must remain in control of systems and decisions***
- Also, patients must understand the role AI is playing in their care (e.g. are treatment recommendations from the provider or from AI, or both)
- Protecting of privacy and confidentiality must be maintained; valid informed consent must be provided before personal data is collected and used to train AI systems

Beneficence

- AI designers must satisfy appropriate regulatory requirements for safety, accuracy, and efficacy (indications, risks, and benefits must be clearly demonstrated)
- Ongoing quality assurance measures should be in place to optimize benefit
- Preventing harms requires that AI not result in physical or mental harm and that alternative approaches to AI be made available for those who want them



Intelligibility & Accountability

- AI technologies should be understandable to developers, healthcare professionals, patients, and regulators
- Transparency requires that sufficient information be documented and appropriately vetted before deployment of an AI technology
- Technologies should be explainable to the capacity of patients and providers; the “opacity” of AI remains a challenge
- If something goes wrong, there must be accountability and clear mechanisms for investigation and redress

Justice

- Access and use of AI technology should be made available to all, irrespective of age, sex, race, or income
- Technology should not encode biases to the disadvantage of marginalized groups
- AI systems should be monitored and evaluated for disproportionate effects on specific groups of people; no technology should worsen bias or discrimination of any kind
- Governments and workplaces should anticipate disruptions and provide training related to adapting to these new systems, including those related to job losses

Specific Ethical Concerns

- Privacy & Security
- Informed consent
- Job displacement



Privacy & Security

- **Data Security:** As AI systems require vast amounts of data for training and validation, there's an increased risk of data breaches, with potential unauthorized access to sensitive patient information
- **Inadvertent Sharing:** With AI-driven applications, there's a potential for accidental sharing of confidential patient data, especially when integrated with EHR systems or other platforms
- **Data Bias and Anonymization:** AI models may inadvertently learn and retain information from datasets that weren't adequately anonymized, potentially revealing identifiable patient traits or details

Informed Consent

- **Secondary Usage:** Once data is collected, especially in large health databases, there's concern over its secondary use; Data originally collected for one purpose might be used for another (e.g., marketing) without the patient's explicit consent
- **Transparency and Consent:** Patients might be unaware that AI systems are analyzing their data. This poses questions about informed consent and whether patients have the right to opt-out
- **Cross-border Data Transfers:** AI healthcare applications developed or deployed internationally might involve data transfers across borders, raising concerns about compliance with differing privacy regulations

Augment or Replace?

- Concerns have been raised about whether AI will replace healthcare professionals or ancillary staff
- The goal of AI development is not to replace human beings, but rather to work in collaboration
 - Increased efficiency of work, however, may result in this outcome in some settings
- Some occupations will be more resistant to replacement than others
- Increasing the reach of healthcare professionals to provide more focused, better overall care is the ultimate goal

Hospital-Based Medicine > Nursing

California Nurses Rally Against AI Tools in Healthcare

— They demand hospitals take pause before rushing implementation of "untested" technologies

by [Michael DePeau-Wilson](#), Enterprise & Investigative Writer, MedPage Today ; [Shannon Firth](#), Washington Correspondent, MedPage Today April 23, 2024



ChatGPT vs. Human Doctors

- Correct ER diagnosis 97% of the time (compared to 87% for humans) in one study
- ECG reading was comparable or superior to a cardiologist by an AI-platform
- Google's Med-PaLM2 scored 85% on the US Medical Licensing Exam – at “expert” level (and beyond the needed passing score)
- AI algorithms have been shown to be superior in neurologic and ophthalmologic diagnoses

What about Empathy?

- In 2023 study conducted at the University of California San Diego and published in *JAMA Internal Medicine*, three licensed healthcare professionals compared the responses of ChatGPT and physicians to real-world health questions
- The panel rated the AI's answers nearly four times higher in quality and almost 10 times more empathetic than physicians' replies.

Med-PaLM 2 (2025)

- Developed by Google Research to answer medical questions at expert level
- Scored 86.5% on USMLE-style questions – outperforming GPT-4 and prior models
- Preferred over physician responses in 8 of 9 quality categories (factuality, reasoning, empathy)
- Considered as safe as physician responses by independent medical reviewers

Singhal, K., Tu, T., Gottweis, J., et al. (2025). *Toward expert-level medical question answering with large language models*. Nature Medicine, 31, 943–950.

Oversight & Regulation

- Some AI tools are FDA-regulated
- Evolving algorithms are challenging for traditional oversight mechanisms
 - Many systems update themselves, the system or version approved last year is not the same as today
- Responsibility for appropriate use must remain with human professionals
- All healthcare facilities need clear internal policies and review processes for AI in that facility



<https://www.fda.gov/medical-devices/software-medical-device-samd/artificial-intelligence-and-machine-learning-aiml-enabled-medical-devices>



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What is currently the most frustrating or difficult part of your job in LTC?

Do not edit
How to change the design

① The Slido app must be installed on every computer you're presenting from

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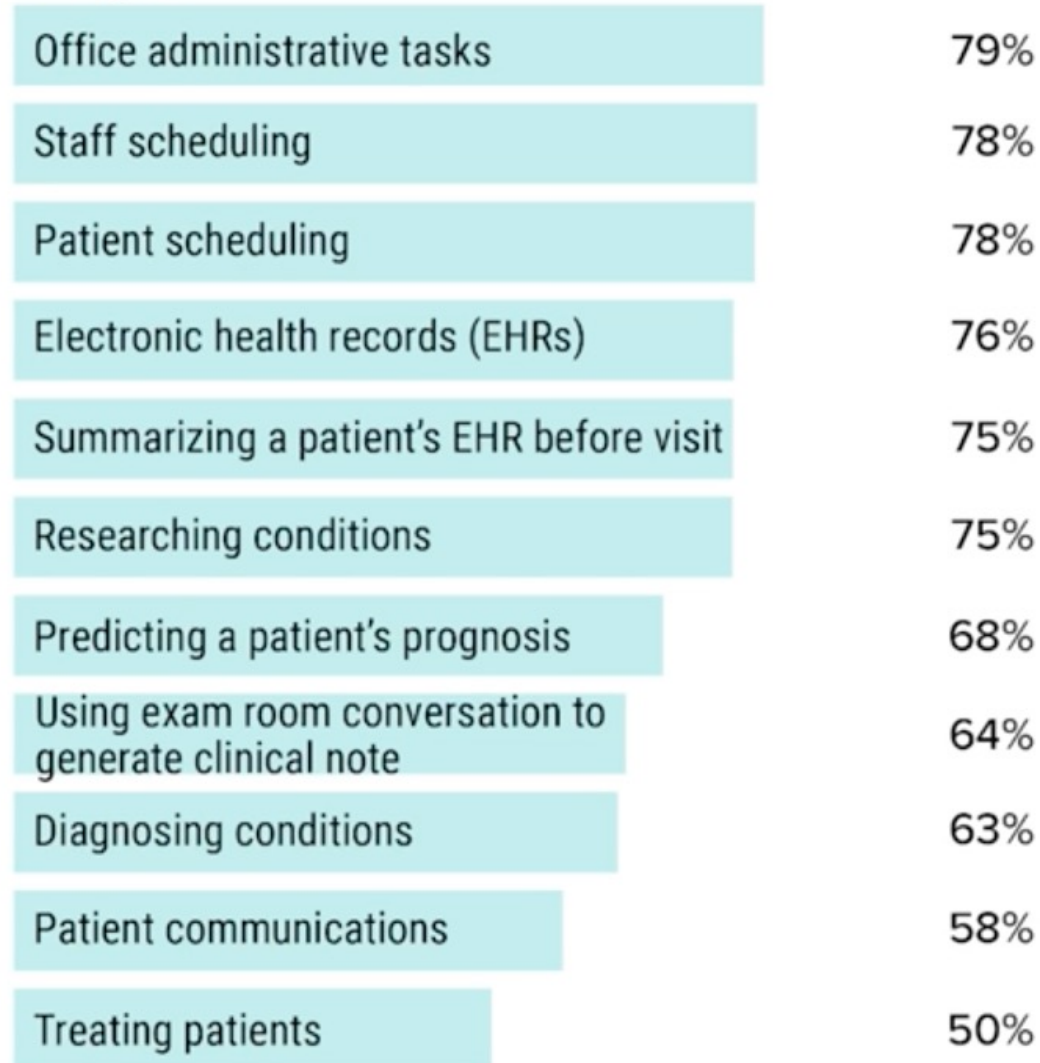
Daily Frustrations...

- Staffing shortages, morale, and burnout
- Administrative burden and documentation
- Clinicians lack of time to spend with patients or residents
- Technology overload or lack of capability or proficiency with EHR system
- Communication issues with team members or patients
- Regulatory compliance and audits
- Others...



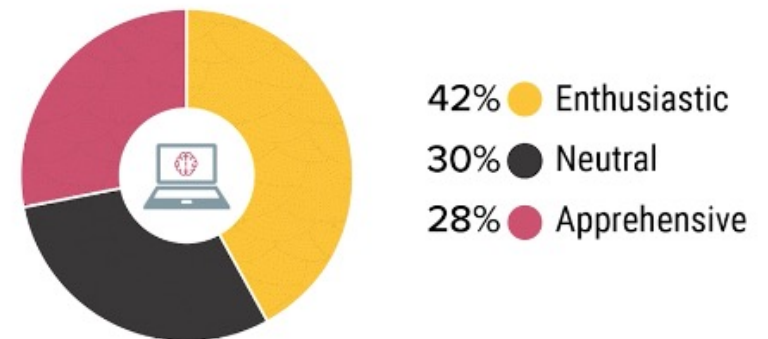
- Which of the frustrations or challenges mentioned feels most pressing at your facility or in your work?
- Have you seen or imagined any solutions (AI-based or otherwise?)
- What would “help” look like to you, realistically and is AI part of the solution?

How Medical Practices Would Consider Using AI



Respondents could choose more than one.

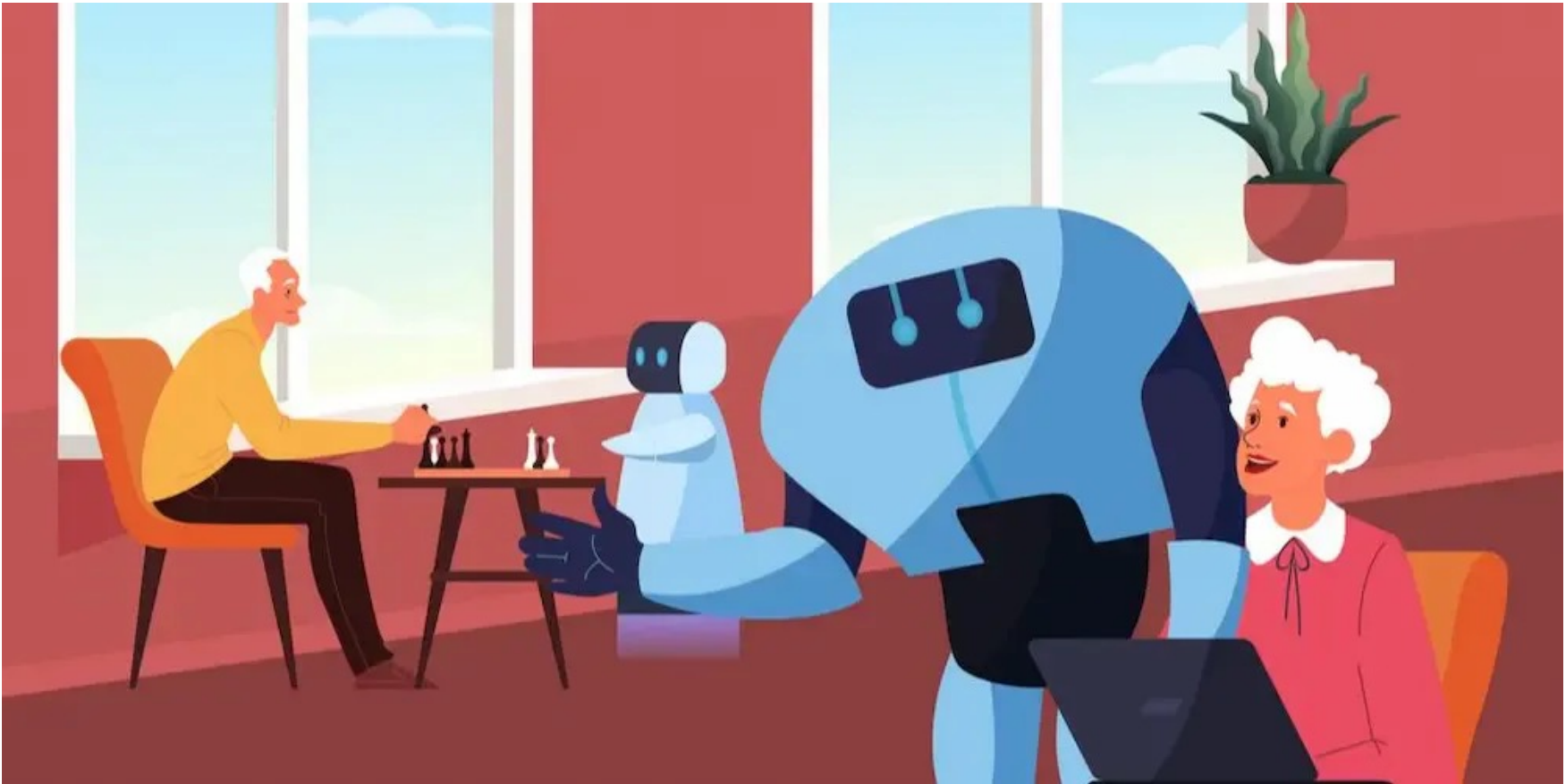
How Physicians Feel About AI's Future in Their Workplace



AI-applications being piloted or in use

- **Predictive Analytics**
 - Predicts ER/ICU bed availability; supports resource allocation and staffing models
- **Virtual Health Assistants**
 - Provide triage guidance and basic medical advice; helps users to decide when to seek care
- **AI Scribes/Ambient Clinical Documentation**
 - Capture and summarize clinician-patient conversations; reduce time spend on documentation, improve face-to-face time for clinicians
- **Natural Language Processing (NLP) EHRs**
 - Extract structured data from clinical notes for coding, billings, prior authorization, and related purposes

The Future of Long-Term Care?



Long-Term Care

- Provides a variety of services to meet chronic health and personal care needs who can no longer live independently
- LTC providers face challenges to meet increased demand due to dramatically increasing aging population/chronic disease burden
- Healthcare providers in LTC often engage in repetitive tasks, many involving physical labor, which leads to stress, burnout, and turnover
- Innovative solutions are needed to meet these demands





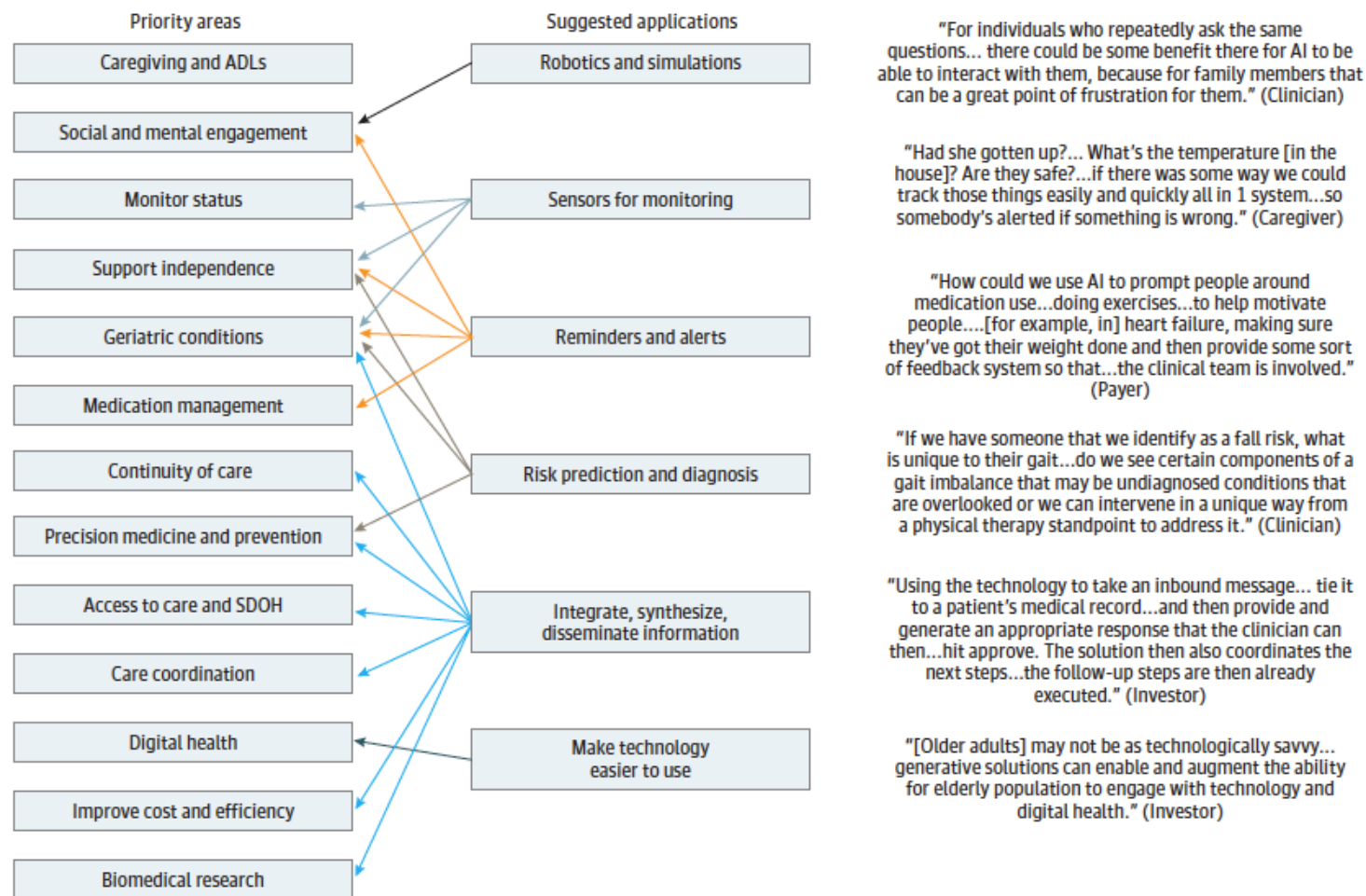
Original Investigation | Geriatrics

Perspectives on AI and Novel Technologies Among Older Adults, Clinicians, Payers, Investors, and Developers

Nancy L. Schoenborn, MD, MHS; Kacey Chae, MD; Jacqueline Massare, BS; Sato Ashida, PhD; Peter Abadir, MD; Alicia I. Arbaje, MD, MPH, PhD; Mathias Unberath, PhD; Phillip Phan, PhD; Thomas K. M. Cudjoe, MD, MPH, MA

Interviews with a wide variety of stakeholders revealed a mismatch between priority needs and proposed AI applications. While daily activities and caregiving were top concerns for older adults, most innovations focused on clinical or efficiency goals. This study highlights the need to better align technology development with what matters most to aging adults and ensure that everyone has a voice in these conversations about what to develop and implement.

Figure 2. Suggested Artificial Intelligence (AI) and Novel Technology Applications by Priority Areas With Illustrative Quotes



Arrows signify participants' suggestions of using an application to address a specific priority area. Arrows for each suggested application are given a different color for clearer visualization. ADLs indicates activities of daily living; SDOH, social determinants of health.

Potential AI-related Innovations

- Personalized care plans
- Proactive and remote health monitoring
- Fall prevention & detection
- Medication management
- Efficiency and resource optimization
- Decision support for healthcare providers
- Virtual assistants and social robots
- Caregiver support

Proactive, Personalized Care

- Individualized Care Plans
 - AI analyzes health history and preferences to tailor care plans that may adapt over time based on changes in resident health data
- Real-Time Health Monitoring
 - Wearables and sensor track vital signs and activity levels
 - Enables early detection of issues such as infections or falls
- Preventative Interventions
 - Predictive models could suggest timely actions before conditions worsen to improve outcomes and reduce emergency transfers

Fall Prevention

- Falls are a major concern in hospitals and long-term care settings, up to 75% of residents fall annually (Rubenstein, 2006)
- AI-powered systems using computer vision and deep learning can predict or detect falls in real-time (Yu et al., 2023)
 - These systems can alert staff quickly, reducing response times and potentially preventing or mitigating fall-related injuries
- AI analyzes gait patterns and can predict fall risk, enabling more proactive interventions



Rubenstein LZ. Falls in older people: epidemiology, risk factors and strategies for prevention. *Age Ageing*. 2006;35

<https://www.virtusense.ai/>



Would you approve the use of a sensor or monitoring device in your own or a loved one's living space(s)?



- AI-powered sensors can monitor for falls in bedrooms and bathrooms with or without using video or audio. However, constant environmental surveillance raises concerns for some – even when it's not capturing images or sound.
 - What distinguishes ethical from unethical monitoring?
 - Should residents or their families have the right to opt-out of the use of such tools?
 - What safeguards make surveillance more acceptable?

Medication Management

- ChatGPT (3.5) can assist with de-prescribing decisions
 - Based on a set of clinical vignettes, ChatGPT flagged 2-4 medications for removal in each case
- Sensitive to patient factors
 - Was able to take into account patients with ADL impairments and CV disease
- Cautions and biases remain
 - Frequently recommended deprescribing pain medications
 - Lacked some internal consistency across test runs

Rao, A., Kim, J., Lie, W., et al. (2024). *Proactive Polypharmacy Management Using Large Language Models: Opportunities to Enhance Geriatric Care*. Journal of Medical Systems, 48, Article 41.

AI-Powered Voice Assistants

- Voice assistants like *Amazon Alexa* and *Google Home* can be customized for long-term care settings
 - AI-powered voice assistants can help residents with activities of daily living, such as setting reminders for medications or appointments
 - May also provide cognitive stimulation and social engagement for residents
- These technologies can promote independence and reduce staff workload for routine tasks

Oewel, B et al.
Voice Assistant Use
in Long-Term Care
July 2023



Efficiency and Resource Optimization

- Staffing challenges are common in long-term care, with high turnover rates and frequent workforce shortages
- AI can analyze historical data on patient needs, staff skills, and preferences to create optimized schedules
- Machine learning algorithms can predict staffing needs based on patient acuity and census fluctuations
- Optimized scheduling can reduce overtime, improve staff satisfaction, and ensure consistent patient care

Robotics for Elder Care

- Cannot replace human contact but could provide stimulation and support for older adult care
 - May be customizable to each user's unique needs, abilities, and preferences
- Older adults and their caregivers should be included to optimize acceptance and effectiveness
- Focus group studies have been conducted

Padhan S, Mohapatra A, Ramasamy SK, Agrawal S. Artificial Intelligence (AI) and Robotics in Elderly Healthcare: Enabling Independence and Quality of Life. *Cureus*. 2023;15(8):e42905.

https://www.youtube.com/watch?v=p5dXv_FN4AA

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Robots for ADLs

- Roomba Robotic Vacuum
- My Spoon-Feeding Robot
- Robear Lifting Robot
- HERB the Robot Butler
- ElliQ Interactive Robot





Moxi –
the
Hospital
Robot



AI-Powered Robotic Companionship



- PARO
 - Robotic seal for dementia care
 - Reduces stress and agitation in memory care units
- Zora (Pepper/NAO)
 - Humanoid robot for activities –leads group exercises, games, and storytelling
- MiRO and ElliQ
 - Companion robots for social interaction

ELLI-Q

Meet ElliQ



<https://elliq.com/pages/testimonials#>

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- After watching these videos, consider the role of AI-powered robots in elder care settings. Some view them as supportive companions that reduce loneliness and assist staff. Others worry about dehumanization, ethical concerns, or even replacing human contact.
- **Do you believe AI robots should play a major role in long-term care? Why or why not?**
- What should be the limits—if any—on how they're used?



Trust & Ethical Considerations

- Important to note that, on average, public trust in healthcare AI is low
- Transparency is needed –knowing when AI is involved in care and what it's doing
- Safeguards are needed to ensure privacy, data security, and ethical use (especially when AI is helping to make clinical decisions)
- Trust can be built through clear communication, involving patients and advocates in planning, and ensuring opt-outs when feasible

What LTC Leaders Can Do Now

- Hold discussions with staff about AI's potential role in operations and care
- Train staff on AI literacy
- Engage patients and their families in the formulation of policies (AI Advisory groups)
- Pilot AI use with established evaluation and feedback loops
- Incorporate ethical questions regarding AI at all levels of planning and implementation

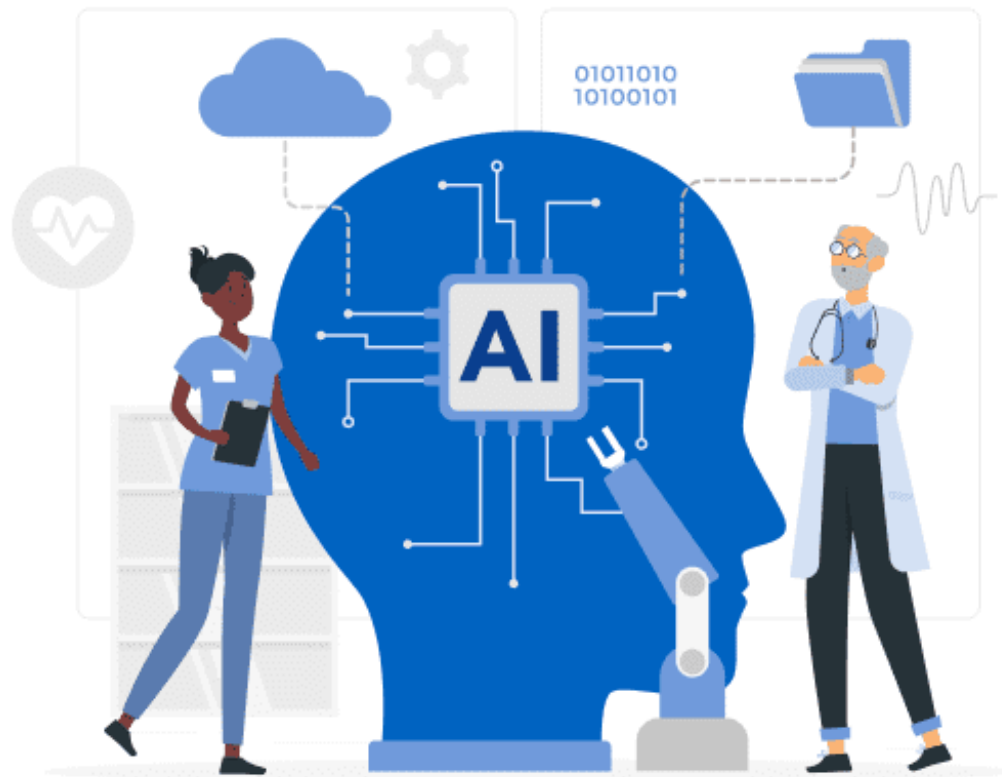


What is ONE THING you will be taking away from this presentation —something to think about, research further, or even implement?

Conclusions

- AI is already changing many different industries, including healthcare
- The applications of AI in healthcare include improved diagnostic capabilities, new treatment modalities, and increasing the efficiency of daily healthcare operations and practices
- Ethical issues of patient autonomy, data safety, and human connection are major considerations in the continual roll-out of AI-related technologies
- This is just the beginning of many more conversations related to this world-changing technology –in LTC and elsewhere

Thank You!



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