

Implications of Patient Awareness, Understanding, and Trust in AI

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AGENDA



- AI in general use and in healthcare
- Implications of awareness, understanding, and trust
- Future

MY INTEREST IS
IN AI IN
HEALTHCARE AND
MEDICINE:
2 PAPERS UNDER
REVIEW

Patient Perspectives on Artificial Intelligence in Medical Imaging

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Abstract

The integration of artificial intelligence (AI) into medical imaging has the potential to improve diagnostic accuracy, efficiency, and patient outcomes. However, its successful adoption may depend not only on technological advancements but also on how AI is perceived and understood by patients. This paper explores patient perspectives on AI in medical imaging, with a focus on trust, human interaction, and ethical considerations such as data privacy and accountability. Studies suggest that while some patients recognize AI's potential to enhance diagnostic processes, others are concerned about losing the empathy and nuanced judgment of clinicians. Concerns about bias in AI, particularly for underrepresented patient populations, and the financial implications of adopting these technologies also emerge as key issues. The paper proposes that increasing transparency about AI use in diagnostics—such as informing patients when AI has contributed to their care—could help address these concerns. Additionally, offering patients more information and choice regarding the AI tools used in their diagnostic processes may foster greater trust. A patient-centered approach that considers these perspectives may help guide the responsible integration of AI in medical imaging. N/A N/A N/A N/A N/A

PATIENT AWARENESS, UNDERSTANDING, AND TRUST IN AI

JMIR Preprints

Gualtieri et al

Patient Awareness, Understanding, and Trust in AI

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Abstract

With artificial intelligence (AI) playing an increasingly prominent role in healthcare, patients are arguably the most impacted. For patients to be empowered in the many ways in which AI impacts their care, rather than remaining passive recipients, they need awareness, understanding, and trust in AI. We evaluate the current state of AI in healthcare from the all-important patient perspective, and consider future directions supporting a more equitable future with enhanced care for the wide variety of patient needs.

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DOI: <https://doi.org/10.2196/preprints.65797>



SCAN ME

AI INFLUENCED BY, OR INFLUENCING, MEDIA

The Jetsons, The Matrix,
The Terminator, Demon
Seed,...

Do these increase or reduce

- Awareness?
- Knowledge?
- Trust?



AI AWARENESS

90% of US adults have heard at least a little about AI (Pew 8/23 survey)

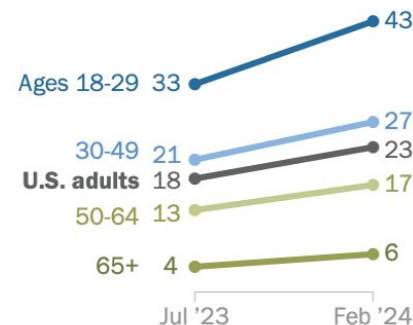
ChatGPT may have been more of a turning point in AI awareness than The Terminator – 58% heard of it (3/23) although only 18% tried it (7/23)

Of common uses of AI, 68% of US adults identified trackers analyzing exercise and sleep patterns, followed by 65% who identified chatbots answering questions (Pew 12/22 survey)

Fascinating examples because of what they can and can't do well

ChatGPT use has ticked up since July, particularly among younger adults

% of U.S. adults who say they have ever used ChatGPT



Note: Those who did not give an answer are not shown.

Source: Survey of U.S. adults conducted Feb. 7-11, 2024.

PEW RESEARCH CENTER

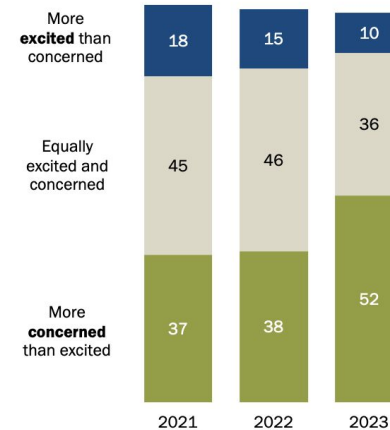
AI CONCERN/EXCITEMENT

Greater concern (52%) than excitement (10%) (Pew 7/23 survey)

How do you explain the trend here?

Concern about artificial intelligence in daily life far outweighs excitement

% of U.S. adults who say the increased use of artificial intelligence in daily life makes them feel ...



Note: Respondents who did not give an answer are not shown.
Source: Survey conducted July 31-Aug. 6, 2023.

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IDENTIFYING AND ADDRESSING FEARS

Fears

- Data privacy
- Reducing the ability to exercise judgment and make independent decisions
- Increasing disparities

Addressing fears

- New regulations, norms, and literacies can help ameliorate technology's shortcomings and people's fears

Or implement solutions that reduce shortcomings and support agency?

HEALTHCARE AS AN EXACERBATOR OF FEARS

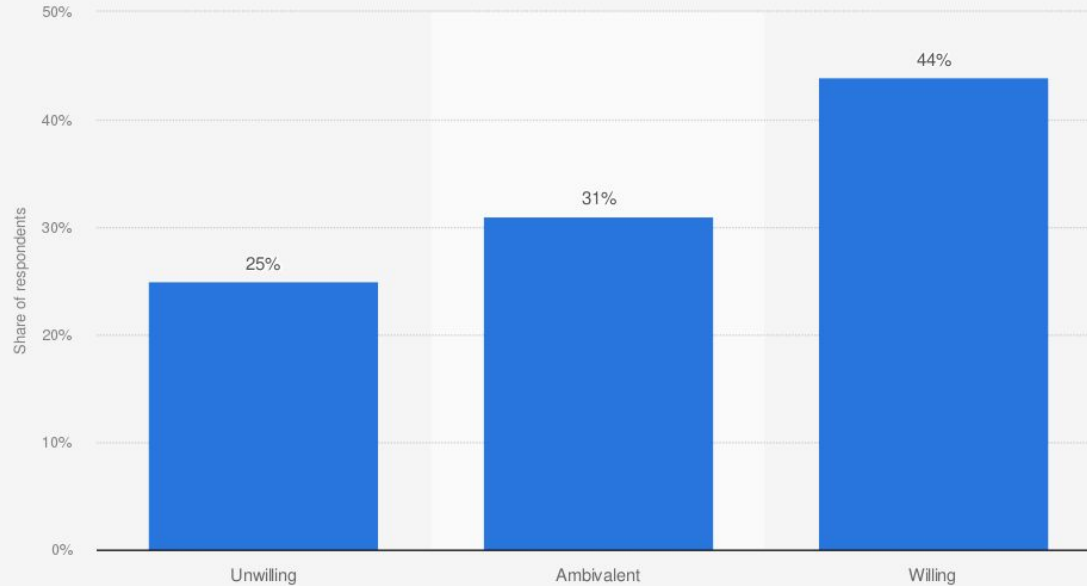
“All physicians, and by association health systems, take an oath to “abstain from all intentional wrong-doing and harm” when they take the Hippocratic oath...some providers and health care organizations are not abiding by this oath, and have contributed to the lack of trust that is prevalent across the US health care system.”

(<https://www2.deloitte.com/us/en/insights/industry/health-care/trust-in-health-care-system.html> 8/21)

TRUST WORLDWIDE

2022

Level of willingness to trust and accept artificial intelligence (AI) systems in healthcare worldwide in 2022



Sources

UQ; KPMG
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Additional Information:

Worldwide; Australia; Brazil; Canada; China; Estonia; Finland; France; Germany; India; Israel; Japan; South Korea; Netherlands; United Kingdom; United States; UQ; KPMG; September to October 2022

TRUST AS A BARRIER TO ADOPTION

While a lack of trust in AI remains a barrier to adoption, 3 principles frame the requirements for trust in AI

1. **Responsibility:** There are problems AI should not solve, making its intent highly relevant. Irresponsible management of data and algorithms can unintentionally instil biases into analyses, with damaging repercussions.
2. **Competence:** Innovations must work – and the health ecosystem will need to come to terms with what defines an acceptable margin of error. Are there different margins of acceptable error for physicians than AI.
3. **Transparency:** Present the limitations of digital, data and AI in healthcare to help maintain trust in the face of imperfect competency.

AI IN HEALTHCARE: WHAT IS PERCEIVED AS GETTING BETTER OR WORSE?



Medical error: 40% vs. 27% of US adults think the use of AI in medicine will reduce rather than increase the number of mistakes made by providers



Reduce bias: 51% say the problem of bias and unfair treatment would get better if AI was used more to diagnose disease and recommend treatments



Patient-provider communication: 57% express concern about AI's impact on the personal connection between a patient and provider



Security: 37% think using AI will make the security of patients' records worse (Pew 12/22 survey)

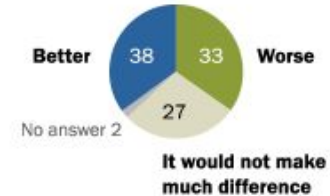
Fewer than half in U.S. expect artificial intelligence in health and medicine to improve patient outcomes

% of U.S. adults who say that thinking about the use of artificial intelligence in health and medicine to do things like diagnose disease and recommend treatments ...

They would feel __ if their health care provider relied on it for their medical care



It would lead to __ health outcomes for patients



Source: Survey conducted Dec. 12-18, 2022.

"60% of Americans Would Be Uncomfortable With Provider Relying on AI in Their Own Health Care"

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DEMOGRAPHICS

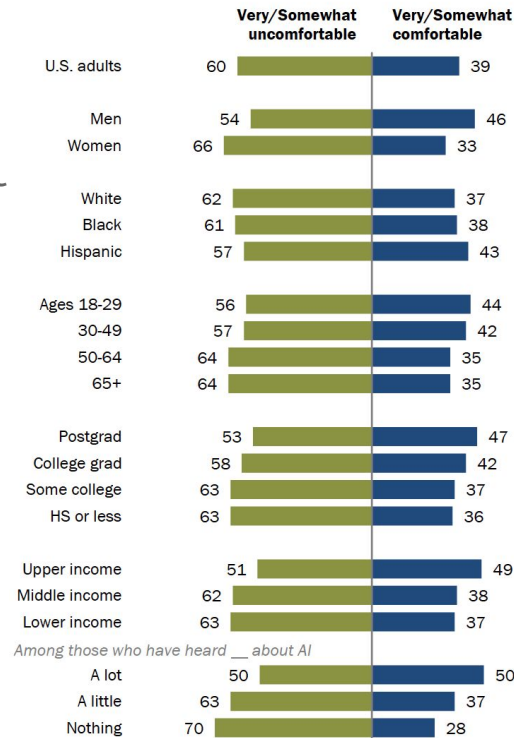
+ Highest comfort: higher income and education

- Lowest comfort - women and older adults

? Should this be addressed? How?

Majority of U.S. adults would be uncomfortable if their health care provider relied on artificial intelligence

% of U.S. adults who say that they would feel ___ if their health care provider relied on artificial intelligence to do things like diagnose disease and recommend treatments



Note: Respondents who did not give an answer are not shown. White and Black adults include those who report being only one race and are not Hispanic. Hispanics are of any race. Family income tiers are based on adjusted 2021 earnings.
Source: Survey conducted Dec. 12-18, 2022.
"60% of Americans Would Be Uncomfortable With Provider Relying on AI in Their Own Health Care"

SPECIFIC AREAS WHERE AI IS USED IN HEALTHCARE

Digital health

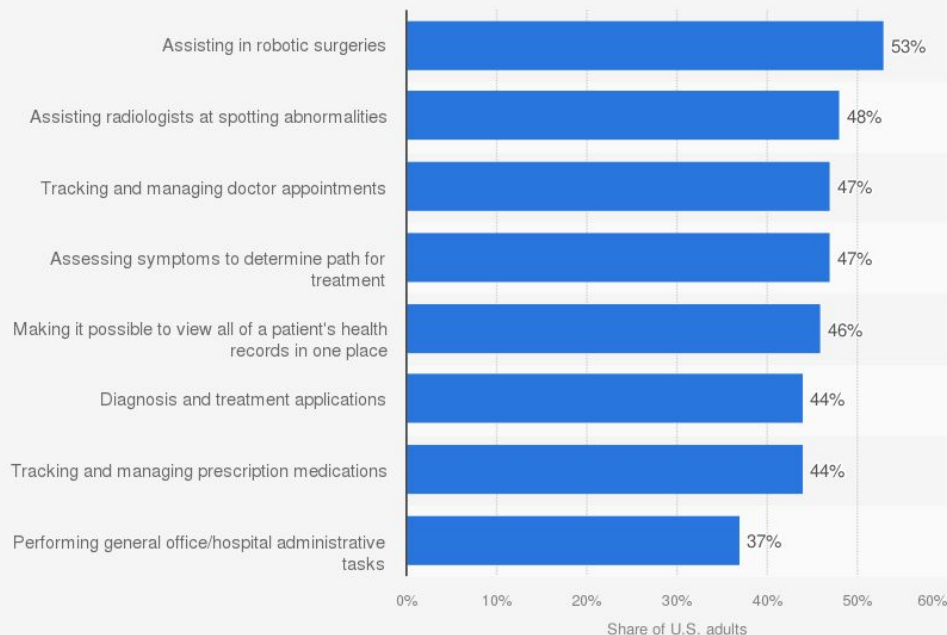
Skin cancer screening

Radiology

Mental health

Scribe

Share of respondents who reported the following applications came to mind when discussing AI use in healthcare in the United States as of 2023



Source
IntelliSurvey
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Additional Information:
United States; IntelliSurvey; 2023; 1,000 respondents; 18 years and older; Sample balanced to census targets on gender, region; Online survey

AI FOR HEARING AIDS



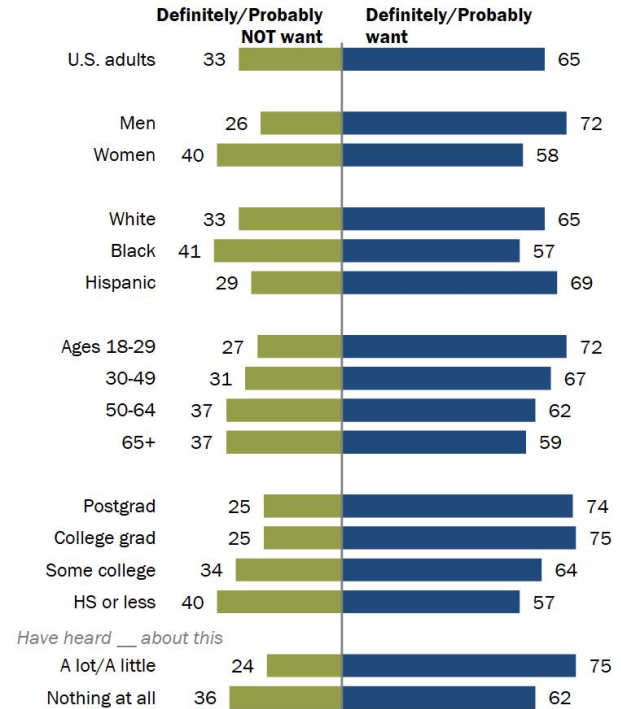
SKIN CANCER SCREENING

Skin cancer screening: 65% of US adults would definitely or probably want AI to be used for their own skin cancer screening (Pew 12/22 survey)

At the same time, a majority of US adults are uncomfortable if their provider relied on AI

65% of U.S. adults say they would want AI to be used in their own skin cancer screening

% of U.S. adults who say they would ___ artificial intelligence to be used in their screening for skin cancer



Note: Respondents who did not give an answer are not shown. White and Black adults include those who report being only one race and are not Hispanic. Hispanics are of any race.

Source: Survey conducted Dec. 12-18, 2022.

"60% of Americans Would Be Uncomfortable With Provider Relying on AI in Their Own Health Care"

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RADIOLOGY

AI to interpret images (X-rays and CT scans) with greater precision to make more accurate diagnoses

Longest well-established history

HMS study: “More accurate AI tools boosted radiologists’ performance, while poorly performing AI tools diminished the diagnostic accuracy of human clinicians.”

(<https://www.nature.com/articles/s41591-024-02850-w>)

How does AI change the nature of radiology?

WHO PERFORMS BETTER: RADIOLOGISTS OR AI?

Radiology














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Standalone AI for Breast Cancer Detection at Screening Digital Mammography and Digital Breast Tomosynthesis: A Systematic Review and Meta-Analysis

 Jung Hyun Yoon   Fredrik Strand,  Pascal A. T. Baltzer,  Emily F. Conant, Fiona J. Gilbert,  Constance D. Lehman,  Elizabeth A. Morris,  Lisa A. Mullen,  Robert M. Nishikawa,  Nisha Sharma,  Ilse Vejborg,  Linda Moy*,  Ritse M. Mann*

* L.M. and R.M.M. are co-senior authors.

✓ [Author Affiliations](#)

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“Standalone AI for screening digital mammography performed as well as or better than radiologists. Compared with digital mammography, there is an insufficient number of studies to assess the performance of AI systems in the interpretation of DBT screening examinations.”

MENTAL HEALTH

ELIZA is a computer program that emulates a Rogerian psychotherapist. Just type your questions and concerns and hit return. Eliza will answer you. When ELIZA first appeared in the 1960's, some people thought it was a human. The “illusion of intelligence” is greatest with certain types of utterances.

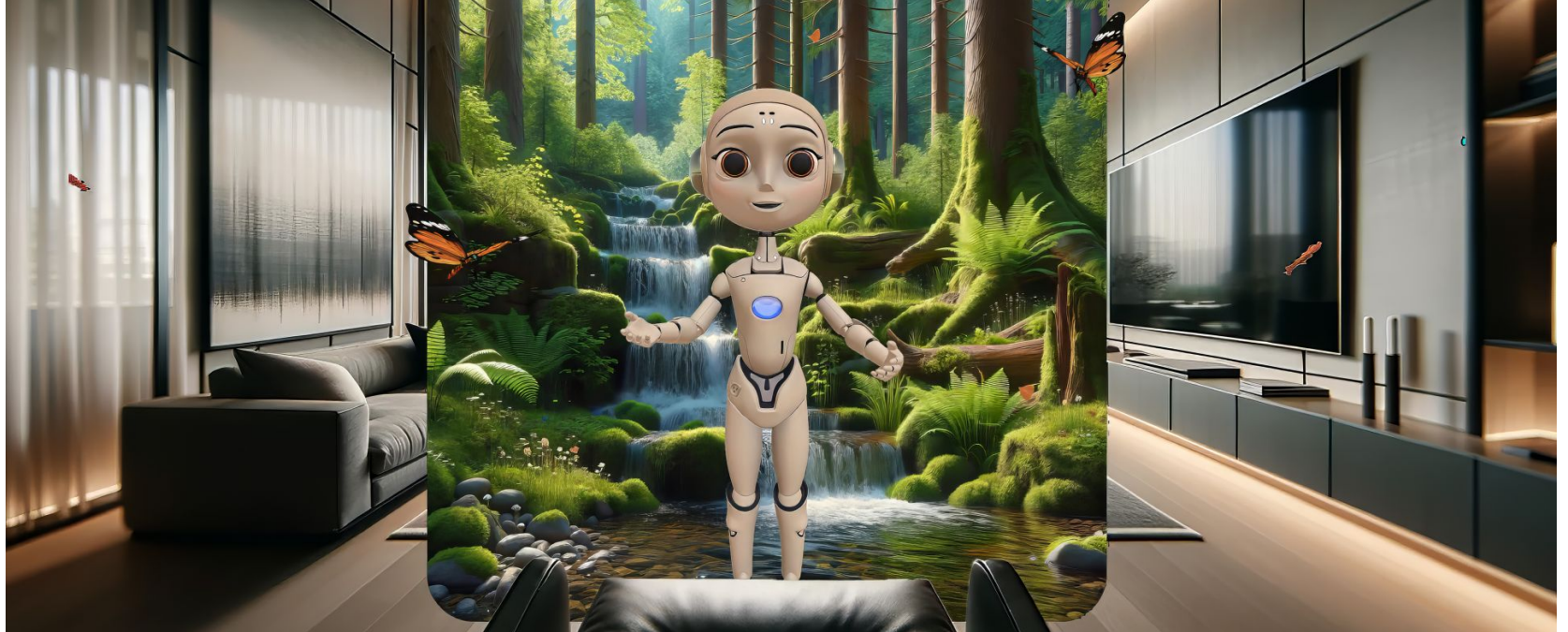
(<https://psych.fullerton.edu/mbirnbaum/psych101/eliza>)

Talk to Eliza

```
> Hello, I am Eliza.  
* Hi Eliza, I am preparing a guest lecture and don't know  
what to talk about.  
> Did you come to me because you are preparing a guest  
lecture and don't know what to talk about?  
* Yes  
> I see.
```

Input:

WOULD YOU PREFER ELIZA OR XAIA?



AI AS A SCRIBE

Documenting appointments:

- Physicians
- Medical scribes
- Transcribed (outsourced) recordings
- AI

Each has pros and cons for workload, accuracy, speed and comfort.

Could fewer medical scribes mean fewer medical students???



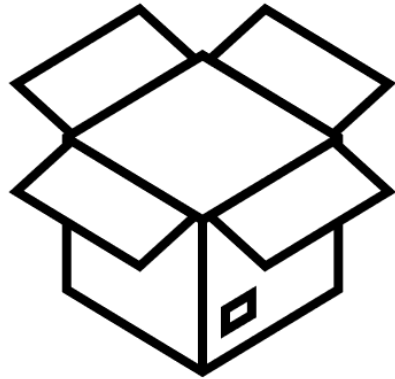
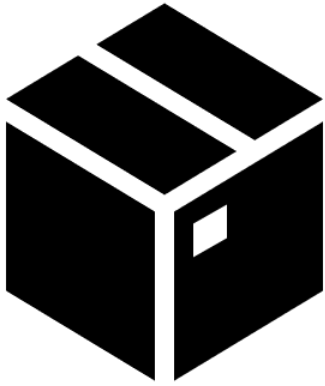
CAN BARRIERS TO PATIENT TRUST BE REDUCED USING WHAT WORKS IN OTHER DOMAINS

From automated vehicles to healthcare: do the recommendations apply

- Focus on benefits besides safety – example, Toyota is adding a “chauffeur” feature
- Provide financial incentives – insurance discounts or tax breaks
- Educate – Melbourne “viral” campaign “Dumb ways to die”; reframing driving well to point out infractions like speeding, using a phone, etc.

OPENING THE BLACK BOX

COULD GREATER TRANSPARENCY, ASSURANCES OF DATA SECURITY, ETC. INCREASE PATIENT TRUST?



Providers may need more education as well as more time to educate patients

Important to understand the many stakeholder roles, especially that of decision-makers.

OUR FUTURE

Applying AI to solve vexing, unsolved problems