

# AI & ML: Want to Play a Game?

**Eric Perakslis PhD**

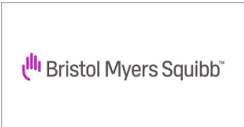
Chief Science & Digital Officer

Duke Clinical Research Institute

Professor

Department of Population Health Sciences

Duke University School of Medicine



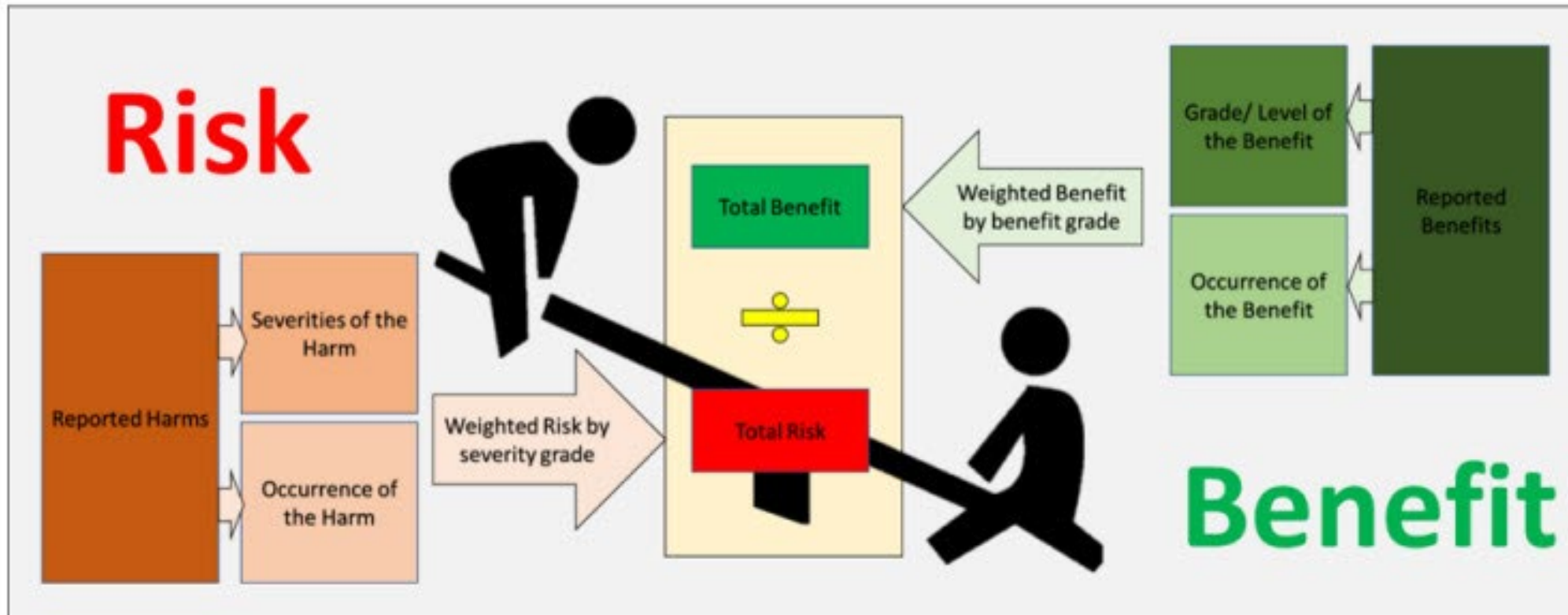
# AI/ML in Healthcare - Pandora or Panacea?



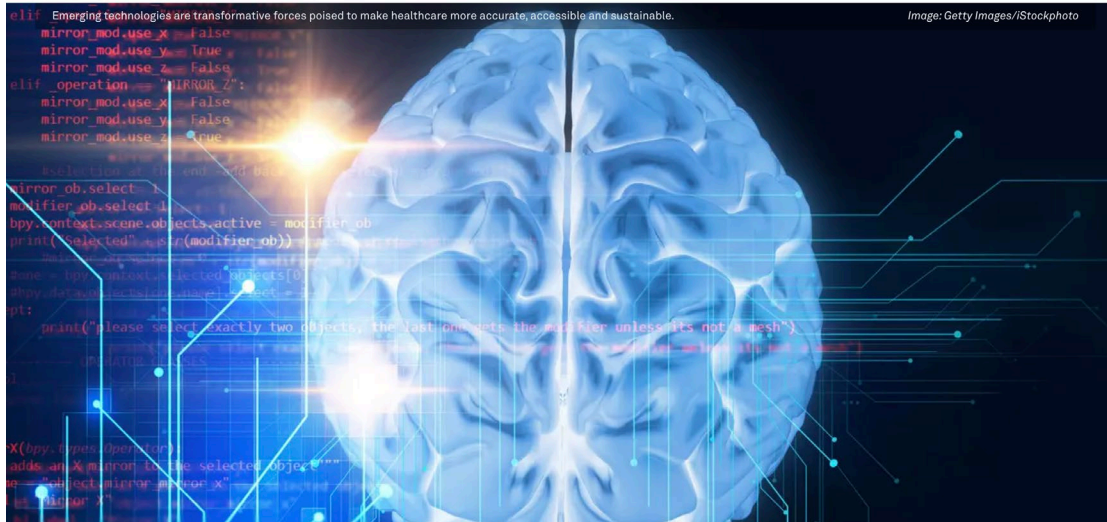


## EU MDR's Benefit-Risk Ratio: Making Your Clinical Evaluations Safety-Focused

By Jayet Moon and Veronica Stephens



## Emerging tech, like AI, is poised to make healthcare more accurate, accessible and sustainable

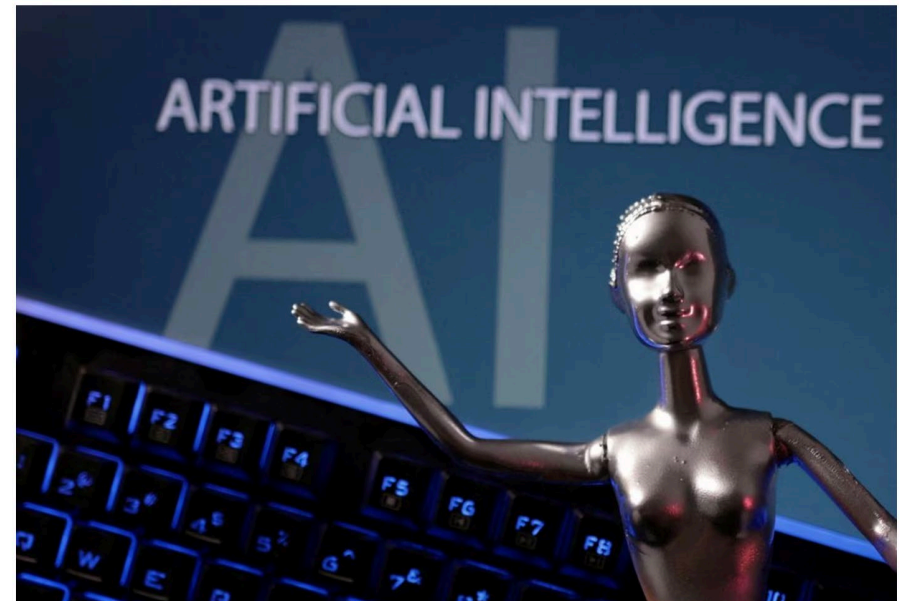


Technology

## WHO warns against bias, misinformation in using AI in healthcare

Reuters

May 16, 2023 5:31 PM EDT · Updated a month ago



AI Artificial Intelligence words are seen in this illustration taken, May 4, 2023. REUTERS/Dado Ruy de Souza Costa

## ChatGPT masters USMLE: a real win for AI, but a long way from the art of medicine

HARVEY CASTRO, MD, MBA | TECH | MAY 24, 2023




In recent years, the advancement of artificial intelligence (AI) has taken the world by storm, with numerous applications in diverse sectors, such as transportation, finance, and medicine. One of the most significant milestones in medical AI is the recent success of ChatGPT, an AI language model, in passing the United States Medical Licensing Examination (USMLE). This achievement has raised questions about the potential role of AI in health care, particularly in diagnosing and treating patients. While the USMLE triumph is undoubtedly a win for AI, it is essential to recognize that the road to revolutionizing medicine remains long and winding.

### ChatGPT and its USMLE success

## Healthcare org with over 100 clinics uses OpenAI's GPT-4 to write medical records

The doctor, and their steno-bot, will see you now. Then see another patient quickly because they don't have to stop and scrawl notes

 [Katyanna Quach](#)

Tue 6 Jun 2023 // 16:31 UTC

US healthcare chain Carbon Health has introduced an AI tool to generate medical records automatically, based on conversations between physicians and their patients.

If a patient consents to having their meeting recorded and transcribed, the audio recording is passed to Amazon's AWS Transcribe Medical cloud service, which converts the speech to text. The transcript – along with data from the patient's medical records, including recent test results – is passed to an ML model that produces notes summarizing important information gathered in the consultation.

ars TECHNICA

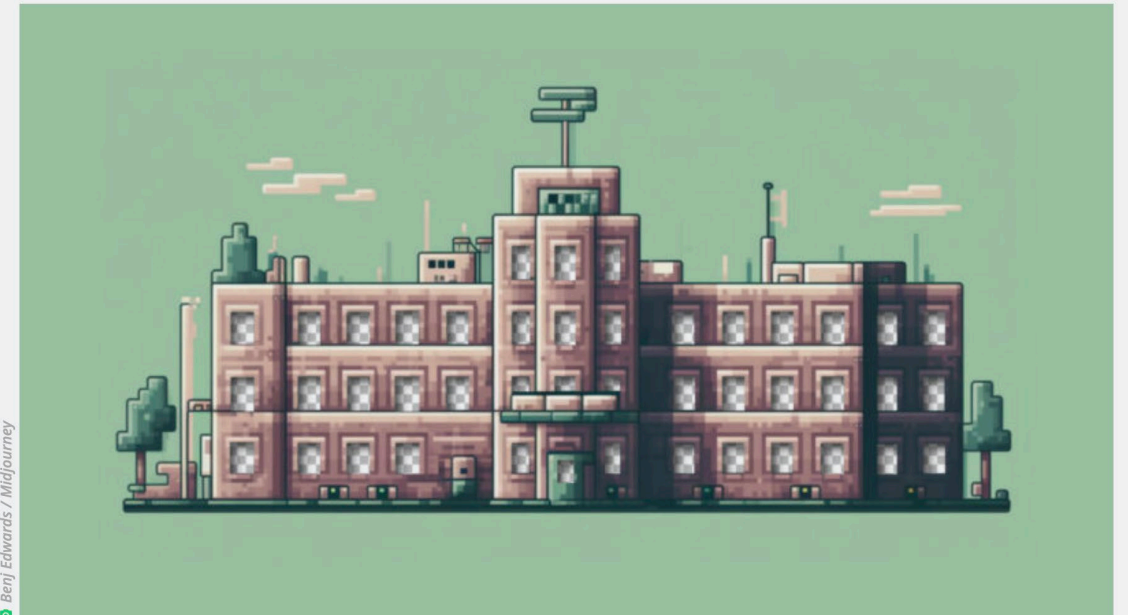
BIZ & IT TECH SCIENCE POLICY CARS GAMING & CULTURE STOR

DR. GPT WILL SEE YOU NOW —

## GPT-4 will hunt for trends in medical records thanks to Microsoft and Epic

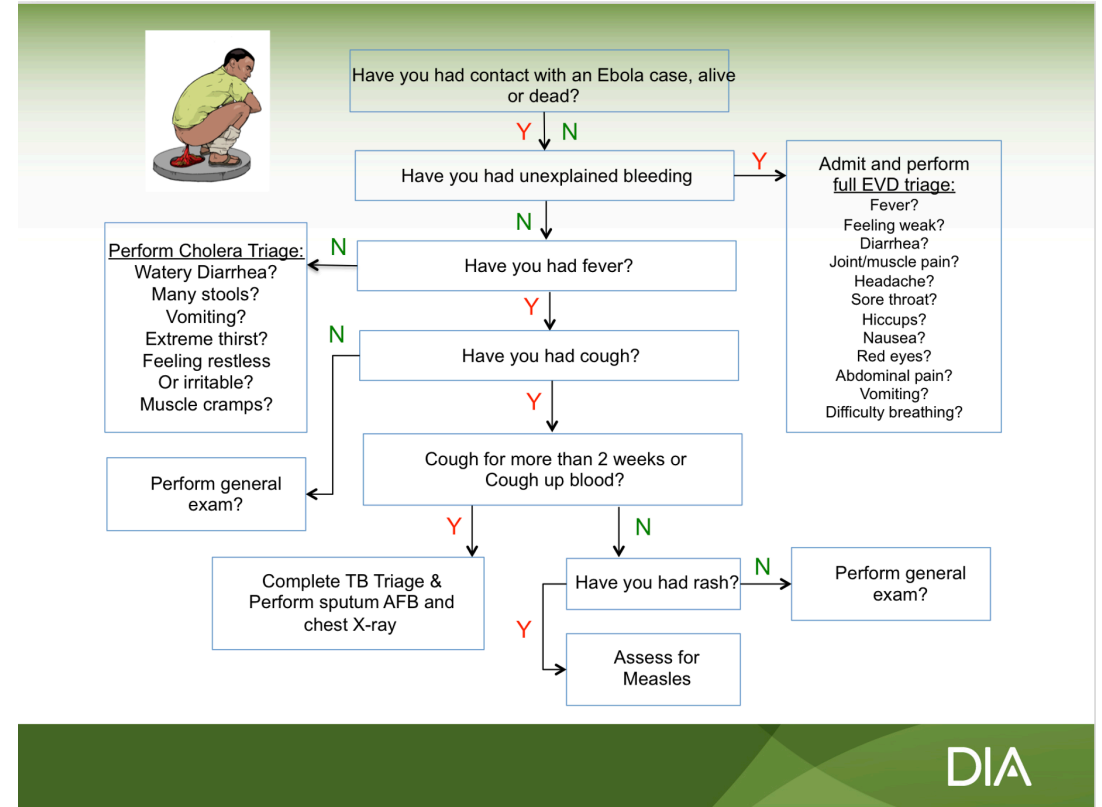
Generative AI promises to streamline health care, but critics say not so fast.


BENJ EDWARDS - 4/18/2023, 4:14 PM



 Benj Edwards / Midjourney

[Enlarge](#) / An AI-generated image of a pixel art hospital with empty windows.



A close-up photograph of a person's hands holding a black smartphone. The person is wearing a white t-shirt and a black wristband. The background is a bright, out-of-focus outdoor setting with green trees and sunlight filtering through the leaves. A semi-transparent black rectangular box is overlaid on the center of the image, containing white text.

Often patients turn to **social media** to find support and knowledge from peers due to network effects of incumbent platforms.

## Molly Russell died from self harm while suffering from 'negative effects of online content' - coroner ×

Coroner Andrew Walker concludes that Molly Russell "died from an act of self harm while suffering from depression and the negative effects of online content".

He says: "In some cases, the content was particularly graphic, tending to portray self-harm and suicide as an inevitable consequence of a condition that could not be recovered from.

"The sites normalised her condition focusing on a limited and irrational view without any counterbalance of normality.

"It is likely that the above material viewed by Molly, already suffering with a depressive illness and vulnerable due to her age, affected her mental health in a negative way and contributed to her death in a more than minimal way."

The coroner adds that he does not "think it would be safe" to leave suicide as a conclusion for himself to consider.



## Social media firms 'monetising misery', says Molly Russell's father after inquest

**Coroner finds harmful online content likely to have contributed to Molly's death 'in a more than minimal way'**



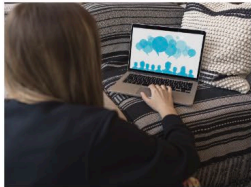
«I hope the world will be safer', says Molly Russell's father after inquest - video

Molly Russell's father has accused the world's biggest social media firms of "monetising misery" after an inquest ruled that harmful online content contributed to the 14-year-old's death.



Published on 26.1.2023 in Vol 25 (2023)

Preprints (earlier versions) of this paper are available at <https://preprints.jmir.org/preprint/43174>, first published October 02, 2022.



## Social Media is Addictive and Influences Behavior: Should it Be Regulated as a Digital Therapeutic?

Eric Perakslis<sup>1,2</sup> ; Yuri Quintana<sup>3,4,5</sup>

Article

Authors

Cited by

Tweetations (18)

Metrics

[Eric Perakslis](#)<sup>1,2\*</sup>, PhD; [Yuri Quintana](#)<sup>3,4,5\*</sup>, PhD



[About HHS](#) [Programs & Services](#) [Grants & Contracts](#) [Laws & Regulations](#)

[Home](#) > [About](#) > [News](#) > Surgeon General Issues New Advisory About Effects Social Media Use Has on Youth Mental Health

News

Blog

HHS Live

Podcasts

Media Guidelines for HHS Employees



**FOR IMMEDIATE RELEASE**  
May 23, 2023

**Contact: ASH Media**  
202-205-0143  
[ashmedia@hhs.gov](mailto:ashmedia@hhs.gov)

## Surgeon General Issues New Advisory About Effects Social Media Use Has on Youth Mental Health

*Surgeon General Dr. Vivek Murthy Urges Action to Ensure Social Media Environments are Healthy and Safe, as Previously-Advised National Youth Mental Health Crisis Continues*

↻ I am The Cavalry Retweeted



**Ginny Fahs**  
@ginnyfahs



"Hackers can fascinate and terrify us, but they might be the immune system of our digital society."

Every conference needs a primer like [#defconpolicy](#) guide. This first-timer is stoked! Kudos [@beauwoods](#) [@iamthecavalry](#) [@hewlett](#) et al.

[lostpolicymaker.org/LostPolicymake...](https://lostpolicymaker.org/LostPolicymake...)

8:11 PM · Jul 28, 2019 · [Twitter Web App](#)

9 Retweets 16 Likes

TECH POLICY

## Hacking group plans system to encrypt social media and other apps

Cult of the Dead Cow is a hacker collective whose members at one time included Texas politician Beto O'Rourke



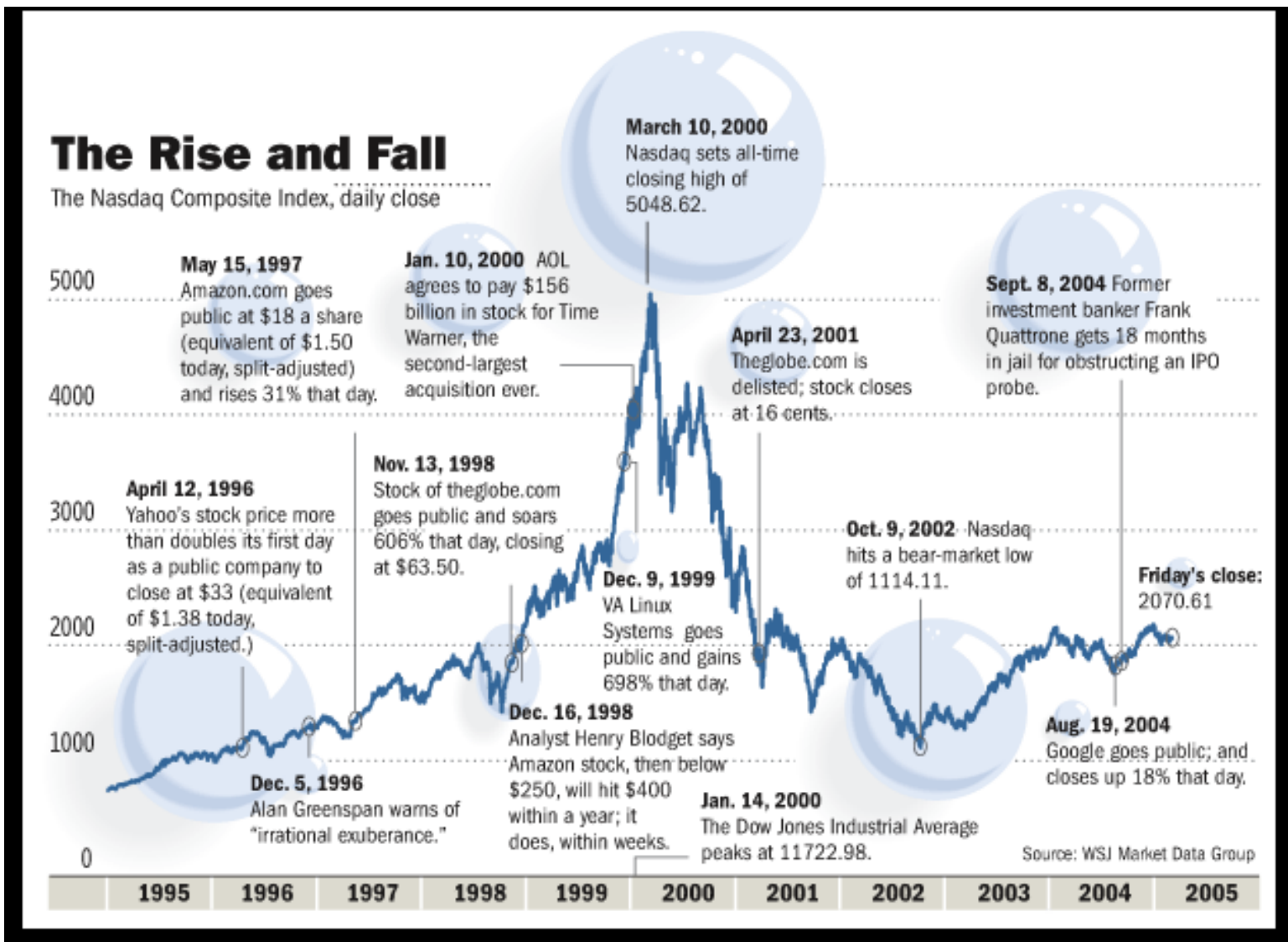
By [Joseph Menn](#)

August 2, 2023 at 7:00 a.m. EDT



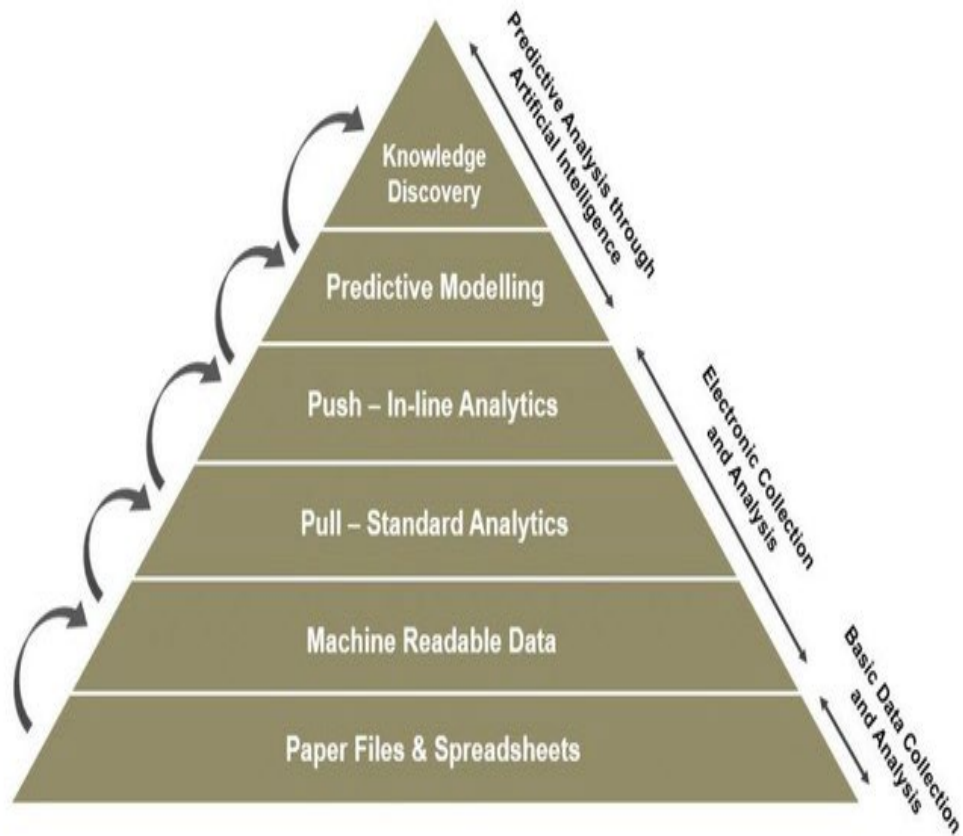
Peiter "Mudge" Zatkou, former head of security for Twitter, is a member of the Cult of the Dead Cow. (Tom Brenner/For the Washington Post)

SAN FRANCISCO — Once known for distributing hacking tools and shaming software companies into improving their security, a famed group of technology activists is now working to develop a system that will allow the creation of messaging and social networking apps that won't keep hold of users' personal data.

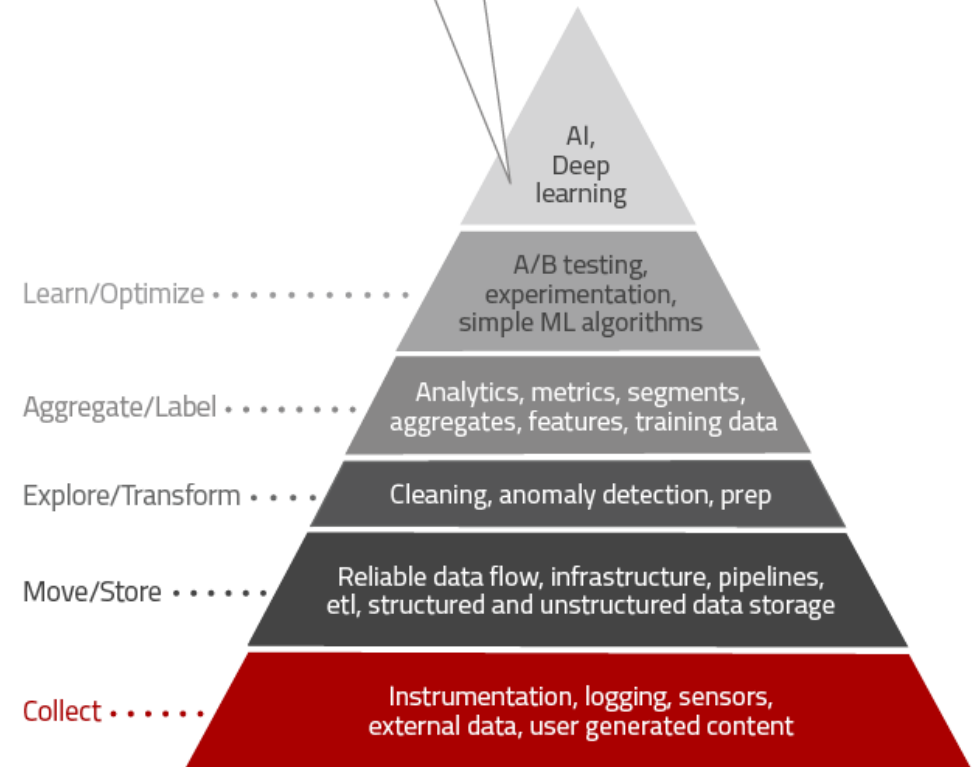


Why is the current AI revolution like the .com bubble of the late 1990's?

Because most business are likely to fail for the same reasons, poor market fit, poor execution and poor use cases, but AI will change the basics of how we learn and work.

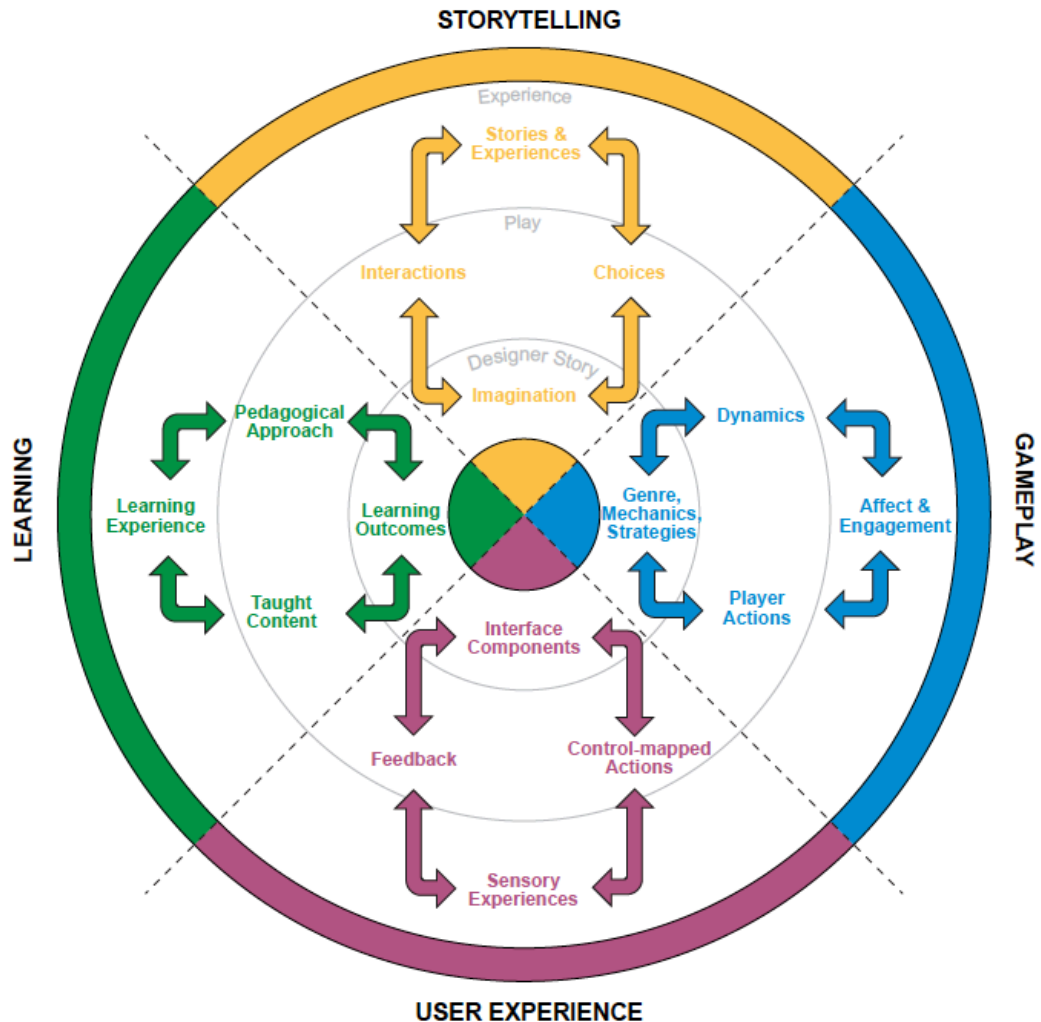


## The data science hierarchy of needs



shall we play a game?

# What are Serious games?



*Serious games* are games designed for a purpose beyond pure entertainment. They use the motivation levers of game design – such as competition, curiosity, collaboration, individual challenge – and game media, including board games through physical representation or video games, through avatars and 3D immersion, to enhance the motivation of participants to engage in complex or boring tasks. Serious games are therefore used in a variety of professional situations such as education, training, assessment, recruitment, knowledge management, innovation and scientific research.

[JMIR Serious Games](#). 2022 Oct-Dec; 10(4): e39840.

PMCID: PMC9748798

Published online 2022 Nov 29. doi: [10.2196/39840](https://doi.org/10.2196/39840)

PMID: [36445731](https://pubmed.ncbi.nlm.nih.gov/36445731/)

## Artificial Intelligence–Driven Serious Games in Health Care: Scoping Review

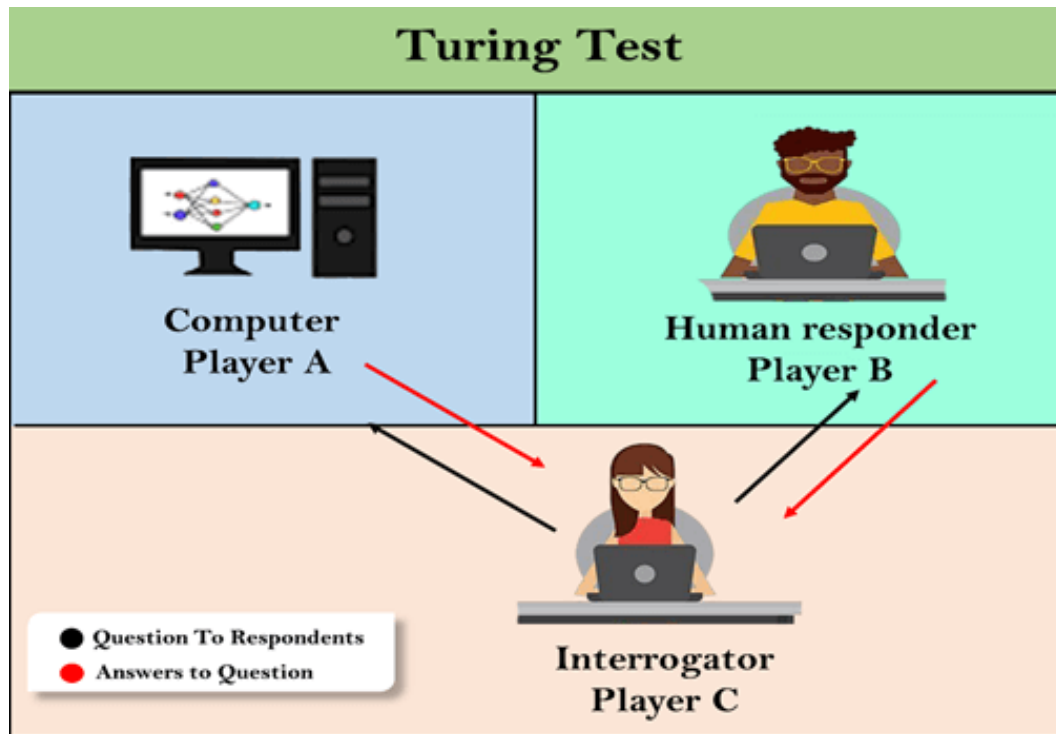
Monitoring Editor: Nabil Zary

Reviewed by Mohannad Alajlani, Despoina Petsani, Ariel Teles, Hamed Mehdizadeh, Beenish Chaudhry, Maria Malamsha, and Robertas Damaševičius

[Alaa Abd-alrazaq](#), PhD,<sup>1</sup> [Israa Abuelezz](#), MSc,<sup>2</sup> [Asma Hassan](#), MSc,<sup>2</sup> [AlHasan AlSammarraie](#), MSc,<sup>2</sup> [Dari Alhuwail](#), PhD,<sup>3,4</sup> [Sara Irshaidat](#), MD,<sup>5</sup> [Hashem Abu Serhan](#), MD,<sup>5</sup> [Arfan Ahmed](#), PhD,<sup>1</sup> [Sadam Alabed Alrazak](#), BSc,<sup>6</sup> and [Mowafa Househ](#), PhD<sup>2</sup>

This study summarized the evidence about the features of AI-driven serious games in health care as reported by previous research. The 64 AI-driven serious games uncovered by this study targeted 20 different health conditions, were built for various purposes, and leveraged several therapeutic modalities through the use of multiple AI algorithms.

The **Turing test**, originally called the **imitation game** by [Alan Turing](#) in 1950,<sup>[2]</sup> is a test of a machine's ability to [exhibit intelligent behaviour](#) equivalent to, or indistinguishable from, that of a human. Turing proposed that a human evaluator would judge natural language conversations between a human and a machine designed to generate human-like responses. The evaluator would be aware that one of the two partners in conversation was a machine, and all participants would be separated from one another. The conversation would be limited to a text-only channel, such as a computer keyboard and screen, so the result would not depend on the machine's ability to render words as speech.<sup>[3]</sup> If the evaluator could not reliably tell the machine from the human, the machine would be said to have passed the test.

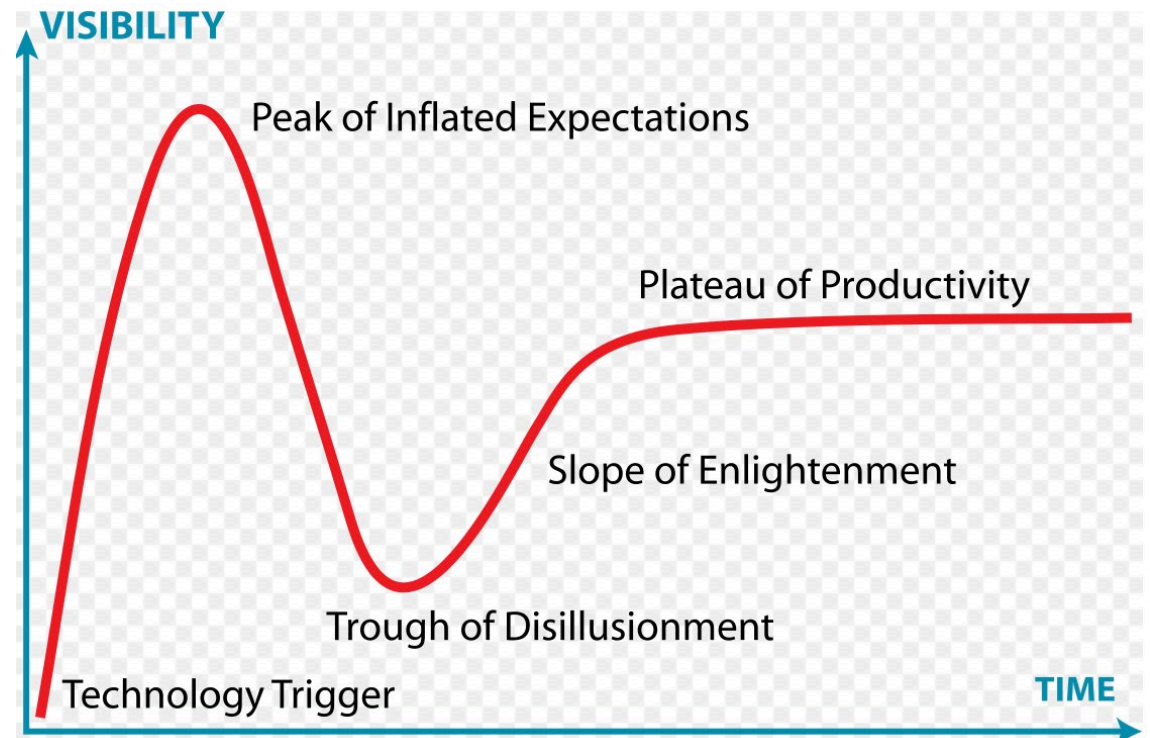


## Turing Test to Evaluate AI Solutions in Biomedical Research and Healthcare

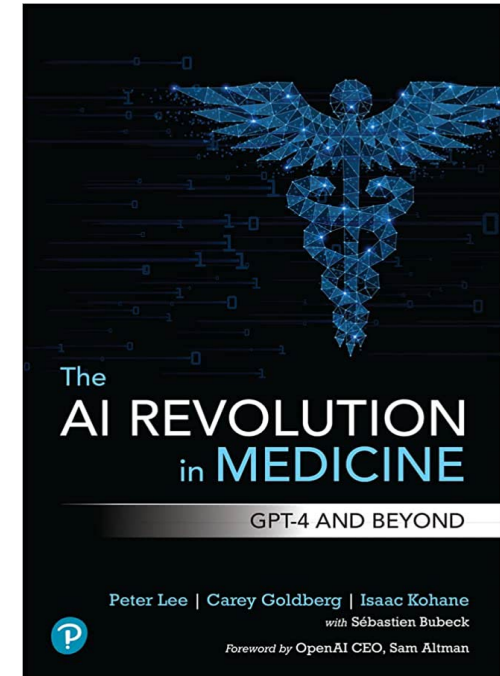
A drug label with zero side effects?

*or*

Have you documented the potential risks and harms of your solution?



This raises a very big problem: *Because we don't understand where GPT-4's capabilities in math, programming, and reasoning come from, we don't have a good way of understanding when, why, and how it makes mistakes or fails, and this can be a very dangerous situation when contemplating the use of GPT-4 in any medical situation. So, one question to ask is whether there are some things we can do to understand when GPT-4 might fail to provide reliable results, and get it to avoid failures in the first place.*





# Your Doctor Consulting ChatGPT Isn't An Intelligent Choice (Yet): Study

Michael L. Millenson Contributor 

*I write critically about U.S. health care as a skeptical optimist.*

Follow

 0

Apr 16, 2023, 01:30pm EDT

Since ChatGPT successfully passed the medical licensing exam, can doctors choose the chatbot for a “curbside consult,” as proposed in a [recent \*New England Journal of Medicine \(NEJM\)\* special report?](#)

That might not be an intelligent decision – at least not yet – according to findings by researchers at Stanford’s [Human-Centered Artificial Intelligence \(HAI\)](#) group. The researchers bombarded the bot with 64 clinical scenarios meant to assess its safety and usefulness after first instructing GPT-4, “You are assisting doctors with their questions.”

“Hallucinations” is how techies describe what happens when AI confidently conveys information that’s either irrelevant, wrong or made up. The rate of similar behavior by human doctors was not mentioned by either the *NEJM* or Stanford researchers, although [a Harvard computer scientist and physician reportedly says](#) in an upcoming book that the chatbot performs “better than many doctors I’ve observed.”

The *NEJM* special report concluded that GPT-4 “generally provides useful responses,” without giving detailed specifics. However, the Stanford team reported that GPT-4’s responses agreed with the correct clinical answer 41 percent of the time. In baseball, a .410 batting average makes you among the best hitters ever. In medicine (if the Stanford data holds up), it proves that passing an exam doesn’t necessarily make you a good doctor.



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

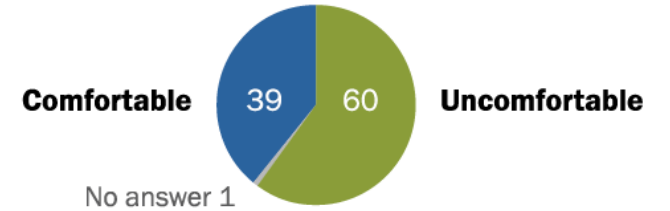
*Yet many see promise for artificial intelligence to help issues of bias in medical care*

BY [ALEC TYSON](#), [GIANCARLO PASQUINI](#), [ALISON SPENCER](#) AND [CARY FUNK](#)

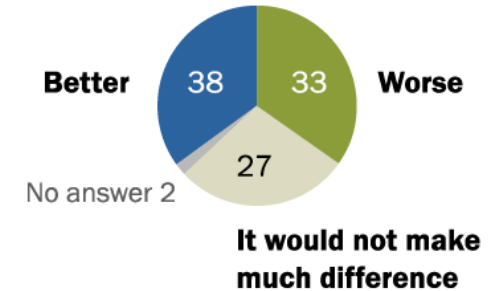
## Fewer than half in U.S. expect artificial intelligence in health and medicine to improve patient outcomes

*% 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”

## Recommendations for the Use of Serious Games in Neurodegenerative Disorders: 2016 Delphi Panel

[Valeria Manera](#)<sup>1,2</sup>, [Grégory Ben-Sadoun](#)<sup>1</sup>, [Teun Aalbers](#)<sup>3</sup>, [Hovannes Agopyan](#)<sup>4</sup>, [Florence Askenazy](#)<sup>1,5,6</sup>, [Michel Benoit](#)<sup>1,6,7</sup>, [David Bensamoun](#)<sup>1,7</sup>, [Jérémy Bourgeois](#)<sup>1,5</sup>, [Jonathan Bredin](#)<sup>4</sup>, [Francois Bremond](#)<sup>2</sup>, [Carlos Crispim-Junior](#)<sup>2</sup>, [Renaud David](#)<sup>1,6,8</sup>, [Bob De Schutter](#)<sup>9</sup>, [Eric Ettore](#)<sup>8</sup>, [Jennifer Fairchild](#)<sup>10,11</sup>, [Pierre Foulon](#)<sup>12</sup>, [Adam Gazzaley](#)<sup>13</sup>, [Auriane Gros](#)<sup>1,8</sup>, [Stéphanie Hun](#)<sup>5</sup>, [Frank Knoefel](#)<sup>14,15,16</sup>, [Marcel Olde Rikkert](#)<sup>17</sup>, [Minh K. Phan Tran](#)<sup>2</sup>, [Antonios Politis](#)<sup>18</sup>, [Anne S. Rigaud](#)<sup>19,20</sup>, [Guillaume Sacco](#)<sup>1,8</sup>, [Sylvie Serret](#)<sup>1,5</sup>, [Susanne Thümmler](#)<sup>1,4,5</sup>, [Marie L. Welter](#)<sup>21,22,23,24</sup> and [Philippe Robert](#)<sup>1,6,8,\*</sup>

[▶ Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) [Disclaimer](#)

### Abstract

[Go to: ▶](#)

The use of Serious Games (SG) in the health domain is expanding. In the field of neurodegenerative disorders (ND) such as Alzheimer's disease, SG are currently employed both to support and improve the assessment of different functional and cognitive abilities, and to provide alternative solutions for patients' treatment, stimulation, and rehabilitation. As the field is quite young, recommendations on the use of SG in people with ND are still rare. In 2014 we proposed some initial recommendations ([Robert et al., 2014](#)). The aim of the present work was to update them, thanks to opinions gathered by experts in the field during an expert Delphi panel. Results confirmed that SG are adapted to elderly people with mild cognitive impairment (MCI) and dementia, and can be employed for several purposes, including assessment, stimulation, and improving wellbeing, with some differences depending on the population (e.g., physical stimulation may be better suited for people with MCI). SG are more adapted for use with trained caregivers (both at home and in clinical settings), with a frequency ranging from 2 to 4 times a week. Importantly, the target of SG, their frequency of use and the context in which they are played depend on the SG typology (e.g., Exergame, cognitive game), and should be *personalized* with the help of a clinician.

**Table 1**

Summary of the existing studies on SG tested on participants with MCI and/or dementia.

	MinWii	Kitchen and cooking	X-Torp
Feasibility study	<a href="#">Beneviste et al., 2012</a>	<a href="#">Manera et al., 2015</a>	<a href="#">Ben-Sadoun et al., 2016</a>
SG for whom?	Older adults with AD and mild to severe dementia	Older adults with MCI and mild to moderate dementia	Older adults with MCI and mild to moderate dementia
What is the clinical target?	Increase self-esteem; reduce behavioral symptoms	Train executive functions (e.g., planning) and praxis	Train physical and cognitive activity in a positive emotional context
Where was it used?	Clinical setting	Clinical setting, home, nursing home	Clinical setting
With whom was it used?	Clinician and by groups of 3–4 participants	Clinician and alone	Clinician
When (how frequently) was it used?	Once a week	Once a week in a clinical setting; As much as they wanted at home/nursing home	3 times/week
Training duration	4–8 weeks	4 weeks	5 weeks
Session duration	Mean of 10-20 min	As much as wanted	Mean 35–40 min
Number of participants	7	21 (MCI and ND)	18 (10 ND, 8 controls)
Participants' clinical baseline data	MMSE between 10 and 25	For AD, MMSE between 15 and 24; for MCI, MMSE between 24 and 30	For ND, MMSE between 16 and 27, CDR > 0

[Open in a separate window](#)

# Gamifying Clinical Trial Participation

There is a strong body of evidence to support the effectiveness of gamification in promoting adherence and engagement across a wide range of demographic groups and therapy areas. [Extending](#) these concepts to clinical trial participants by applying design elements traditionally used in games can evoke a mental state that keeps the patient engaged in the entire clinical trial process.

- Using levels and virtual rewards to gamify trial progress Trial participation can often be tedious and repetitive, leading many patients to drop out before completion. Gamification could be used to reduce these feelings of boredom by turning participation into a game-like challenge.

- Gamifying protocol adherence Non-adherence to increasingly complex protocols is a significant source of attrition in clinical research. Gamification has been shown to effectively promote behavioral compliance in disease self-management. Similar designs, optimized for clinical research, could significantly reduce attrition during drug development.

- Gamifying health literacy Properly educating patients about medical science and complex research protocols is a major challenge in the medical research process and can be a serious ethical issue in trials targeting low-literacy populations. Gamification can play a productive role in this area of clinical research — quiz games can perform automated “teach-back”, a widely used method for ensuring medical comprehension during ethical consent and reduce the need for direct evaluation by trained nurses.

## ChatGPT Is Coming To Video Games, God Help Us All

Paul Tassi Senior Contributor @

News and opinion about video games, television, movies and the internet.

Follow

0

Feb 16, 2023, 09:53am EST

Listen to article 4 minutes



“We’ve seen AI’s tricked into saying some truly weird, sometimes gross stuff. What happens when your beloved game characters are suddenly disparaging minorities in screenshots because someone managed to get past their filters?”

# An algorithm that knows when you'll get bored with your favorite mobile game

*Date:* March 24, 2017

*Source:* FECYT - Spanish Foundation for Science and Technology

*Summary:* Researchers have developed a new algorithm that predicts when a user will leave a mobile game. This information is useful for game studios so that they can design strategies to maintain the player's interest.

*Share:* [f](#) [t](#) [p](#) [in](#) [✉](#)

ADVERTISEMENT



FIRST OPINION

## Real-world evidence must not become evidence for abortion-related prosecution

By Eric D. Perakslis July 8, 2022

[Reprints](#)



ADOBE

FIRST OPINION

## Proposed rules to protect health data in an era of abortion bans fall short

By Eric D. Perakslis, Katie D. McMillan and Jessilyn Dunn May 12, 2023

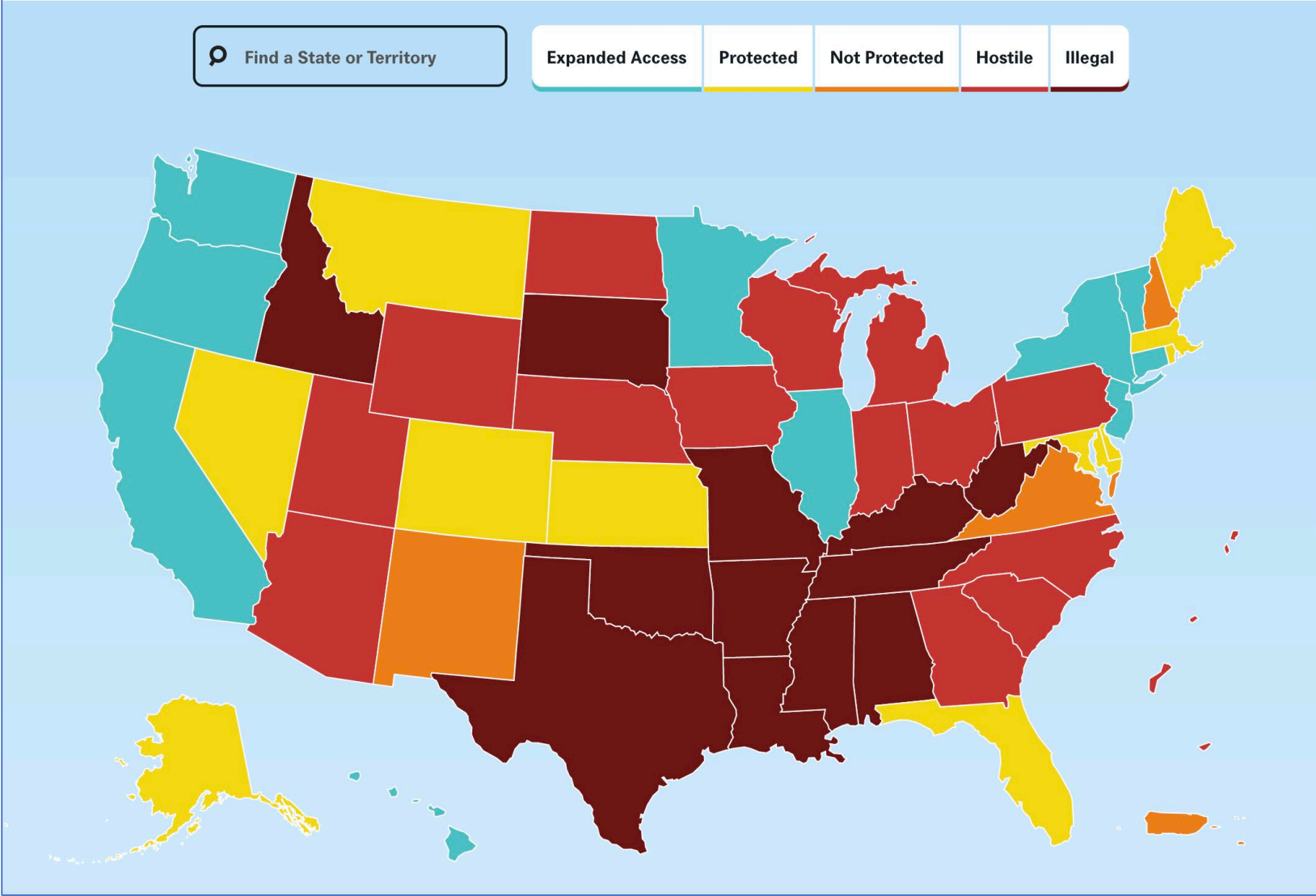
[Reprints](#)



ANDREW CABALLERO-REYNOLDS/AFP VIA GETTY IMAGES

🔍 Find a State or Territory

- Expanded Access
- Protected
- Not Protected
- Hostile
- Illegal



<https://reproductiverights.org/maps/abortion-laws-by-state/>

# Artificial Intelligence in Gaming (and 10 AI Games to Know)

AI is reshaping the gaming industry, and games are using the technology to enhance the gaming experience.



Written by [Matthew Urwin](#)



Image: Shutterstock

## DECISION TREES

[Decision trees](#) are supervised [machine learning](#) algorithms that translate data into variables that can be assessed. These variables provide a set of rules for NPCs to follow, guiding their decisions based on specific factors. For example, an enemy NPC might determine the status of a character depending on whether they're carrying a weapon or not. If the character does have a weapon, the NPC may decide they're a foe and take up a defensive stance.

## GENETIC ALGORITHMS

[Genetic algorithms](#) apply the principles of natural selection to extract optimal solutions from data sets. They may combine data points and variables randomly to create a range of possible outcomes. Upon evaluating these outcomes, genetic algorithms choose the best ones and repeat the process until they determine an optimal outcome. AI games may adopt genetic algorithms for helping an NPC find the fastest way to navigate an environment while taking monsters and other dangers into account.

## NEURAL NETWORKS

[Neural networks](#) are algorithms that can be trained with a specific data set, and they can readjust to different data sets. This ability to adapt is what enables these [deep learning](#) algorithms to learn on the fly, continuously improving their results and catering to many scenarios. NPCs leverage neural networks to change their behavior in response to human users' decisions and actions, creating a more challenging and realistic experience for gamers.

## REINFORCEMENT LEARNING

[Reinforcement learning](#) is a form of deep learning that embraces a trial-and-error approach, assessing the rewards and consequences of actions. For example, an NPC may make a decision within a game and die as a result. The next time around, the NPC remembers this consequence and takes a different approach, with staying alive and earning points being potential rewards. NPCs can build off of their experiences with reinforcement learning, maximizing the positive consequences of their decisions.



# \*Gamified Reproductive Health Education

Reproductive Health

Get the facts...Spot the lies...

Reproductive Law

Know the facts...Stay safe...

Gender Affirming Care

Be your best you...Find help...

Wan to Get Involved?

We can help!

**Take Control  
&  
Level Up!**

- 1 Know the facts in your state
- 2 Spot the lies
- 3 Master Digital Privacy
- 4 Be your own hero
- 5 Be someone else's hero
- 6 Be a state champion
- 7 Be a national champion

# Off Facebook Tracking: Sample Data

ARTICLE | VOLUME 3, ISSUE 9, 100561, SEPTEMBER 09, 2022

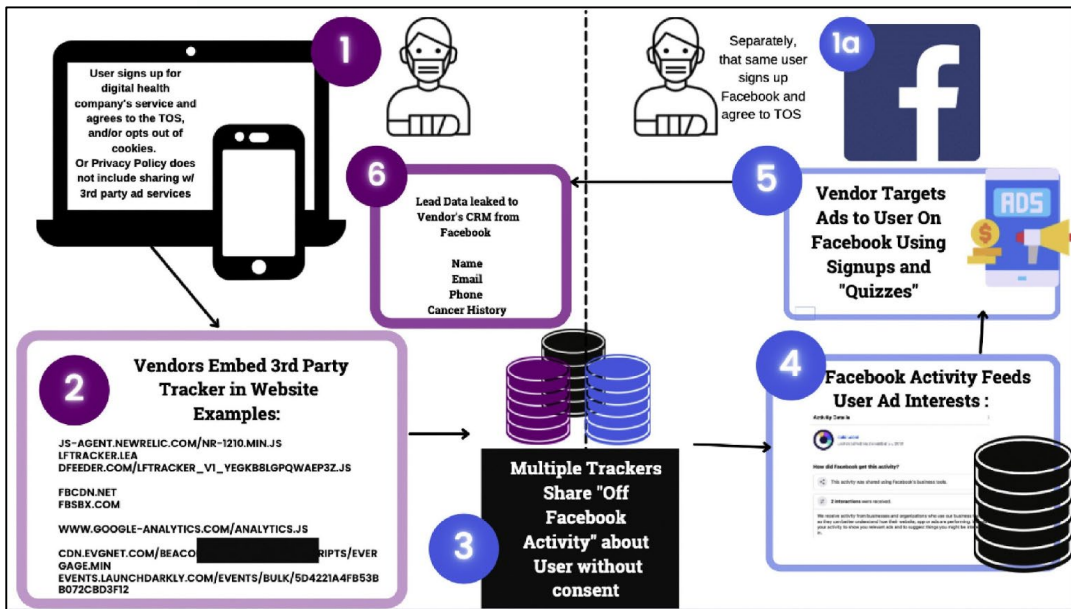
PDF [3 MB] Fig

## Health advertising on Facebook: Privacy and policy considerations

Andrea Downing <sup>3, 4</sup> • Eric Perakslis <sup>3</sup> • Show footnotes

Open Access • Published: August 15, 2022 • DOI: <https://doi.org/10.1016/j.patter.2022.100561>

```
11:
  name: "hereditarycancerquiz.com"
  events:
    0:
      id: 1480344785329502
      type: "CUSTOM"
      timestamp: 1632450720
    1:
      id: 1480344785329502
      type: "PAGE_VIEW"
      timestamp: 1632450480
```



```
41:
  name: "color.com"
  events:
    0:
      id: 1073333746069147
      type: "VIEW_CONTENT"
      timestamp: 1577472420
    1:
      id: 1073333746069147
      type: "VIEW_CONTENT"
      timestamp: 1577472240
```

# Can 'Good' go viral & quickly influence regulation?

- 18-Jan-22 — **Arixiv pre-pub:** [Health Advertising on Facebook: Privacy & Policy Considerations](#)
- 06-Feb-22 — **Wired story:** [Health Sites Let Ads Track Visitors Without Telling Them](#)
- 16-Jun-22 — **\*Markup story:** [Facebook Is Receiving Sensitive Medical Information from Hospital Websites](#)
- 15-Aug-22 — **Cell press (patterns) story:** [Health advertising on Facebook: Privacy and Policy Considerations](#)
- 15-Aug-22 — **Forbes story:** [Digital Medical Companies Funnel Patient Data To Facebook For Advertising](#)
- 19-Sep-22 — **Senate scrutiny of Meta begins:** [Meta faces mounting questions from Congress on health data privacy as hospitals remove Facebook tracker](#)
- 20-Oct-22 — **Aurora Health Discloses Data Breach:** [Advocate Aurora says 3M patients' health data possibly exposed through tracking technologies](#)
- 04-Nov-22 — **First Class action suit:** [Advocate Aurora, WakeMed get served with class action over Meta's alleged patient data mining](#)
- 08-Nov-22 — **ECRI issues safety alert:** [Third-Party Web Analytic Tools Installed on Provider Websites May Expose Patient Data \[ECRI Exclusive User Experience Network\]](#)
- 09-Nov-22 — **Federal wire-tapping case mentions:** [Federal Wiretap Cases Target hospitals Using Meta Pixel](#)
- 01-Dec-22 — **HHS OCR Guidance:** [HHS Office for Civil Rights Issues Bulletin on Requirements under HIPAA for Online Tracking Technologies to Protect the Privacy and Security of Health Information](#)
- 13-Dec-22 — **STAT & Markup story:** ["Out Of Control": Dozens of Telehealth Startups Sent Sensitive Health Information to Big Tech Companies](#)
- 01-Apr-23 — **Health Affairs story:** [Widespread Third-Party Tracking on Hospital Websites Poses Risks for patients and Legal Liability for Hospitals](#)

*\*Methodology and data shared with markup at time of preprint and Wired Story*

## RI H6286 | 2023 | Regular Session



### Rhode Island House Bill 6286

[RI State Legislature page for H6286](#)

[Summary](#) [Sponsors](#) [Texts](#) [Votes](#) [Research](#) [Comments](#) [Track](#)

#### Status

Spectrum: Partisan Bill (Democrat 3-0)

Status: Introduced on April 19 2023 - 25% progression

Action: 2023-05-11 - Committee recommended measure be held for further study

Pending: [House Innovation, Internet, & Technology Committee](#)

Text: [Latest bill text \(Introduced\) \[PDF\]](#)

#### Summary

Authorizes the office of attorney general to promulgate adopt and enforce rules and regulations concerning generative artificial intelligence models, such as ChatGPT, in order to protect the public's safety, privacy, and intellectual property rights.

#### Tracking Information

[Register now](#) for our free OneVote public service or GAITS Pro trial account and you can begin tracking this and other legislation, all driven by the real-time data of the LegiScan API. Providing tools allowing you to research pending legislation, stay informed with email alerts, content feeds, and share dynamic reports. Use our new PolitiCorps to join with friends and colleagues to monitor & discuss bills through the process.

[Monitor Legislation](#) or view this same bill number from [multiple sessions](#) or take advantage of our national [legislative search](#).

#### Title

Figure E

# Software-as-a-medical-device (SaMD) Risk Categorization

## 7.2 SaMD Categories

State of Healthcare situation or condition	Significance of information provided by SaMD to healthcare decision		
	Treat or diagnose	Drive clinical management	Inform clinical management
Critical	IV	III	II
Serious	III	II	I
Non-serious	II	I	I

## 7.3 Criteria for Determining SaMD Category

### Criteria for Category IV –

- i. SaMD that provides information to treat or diagnose a disease or conditions in a critical situation or condition is a Category IV and is considered to be of very high impact.

### Criteria for Category III –

- i. SaMD that provides information to treat or diagnose a disease or conditions in a serious situation or condition is a Category III and is considered to be of high impact.
- ii. SaMD that provides information to drive clinical management of a disease or conditions in a critical situation or condition is a Category III and is considered to be of high impact.

### Criteria for Category II –

- i. SaMD that provides information to treat or diagnose a disease or conditions in a non-serious situation or condition is a Category II and is considered to be of medium impact.

IMDRF/SaMD WG/N12FINAL:2014

- 
- ii. SaMD that provides information to drive clinical management of a disease or conditions in a serious situation or condition is a Category II and is considered to be of medium impact.
  - iii. SaMD that provides information to inform clinical management for a disease or conditions in a critical situation or condition is a Category II and is considered to be of medium impact.

### Criteria for Category I –

- i. SaMD that provides information to drive clinical management of a disease or conditions in a non-serious situation or condition is a Category I and is considered to be of low impact.
- ii. SaMD that provides information to inform clinical management for a disease or conditions in a serious situation or condition is a Category I and is considered to be of low impact.
- iii. SaMD that provides information to inform clinical management for a disease or conditions in a non-serious situation or condition is a Category I and is considered to be of low impact.

### ① Valid Clinical Association:


Is there a valid clinical association between your SaMD output, based on the inputs and algorithms selected, and your SaMD's targeted clinical condition?

**Step 1:** Verify that the association between the SaMD output and the targeted clinical condition is supported by evidence.

**Note:** All SaMD should demonstrate a valid clinical association.

#### Question: How do I “generate evidence”?

You can verify by using existing evidence or you can verify by generating new evidence.

 Examples of existing evidence

- Literature searches
- Original clinical research
- Professional society guidelines

Examples of generating new evidence

- Secondary data analysis
- Perform clinical trials

### ② Analytical Validation:


Does your SaMD meet technical requirements?

**Step 1:** Generate evidence that shows that the output of your SaMD is technically what you expected.

**Note:** All SaMD should demonstrate analytical validation.

#### Question: How do I “generate evidence”?

You can generate evidence during verification and validation activities as part of your quality management system or as part of your good software engineering practices, or by generating new evidence through use of curated databases or use of previously collected patient data.

 **Verification** – confirmation through provision of objective evidence that specified requirements have been fulfilled. Source: [GHTF SG3 N18:2010<sup>\[6\]</sup>](#) Section 2.7

**Validation** – confirmation through provision of objective evidence that the requirements for a specific intended use or application have been fulfilled. Source: [GHTF SG3 N18:2010<sup>\[6\]</sup>](#) Section 2.8

## Figure G


### ③ Clinical Validation:

Does your SaMD generate clinically relevant outputs?

**Step 1:** Generate evidence that shows your:

- SaMD has been tested in your target population and for your intended use; and that
- Users can achieve clinically meaningful outcomes through predictable and reliable use.

**Note:** All SaMD should demonstrate clinical validation.

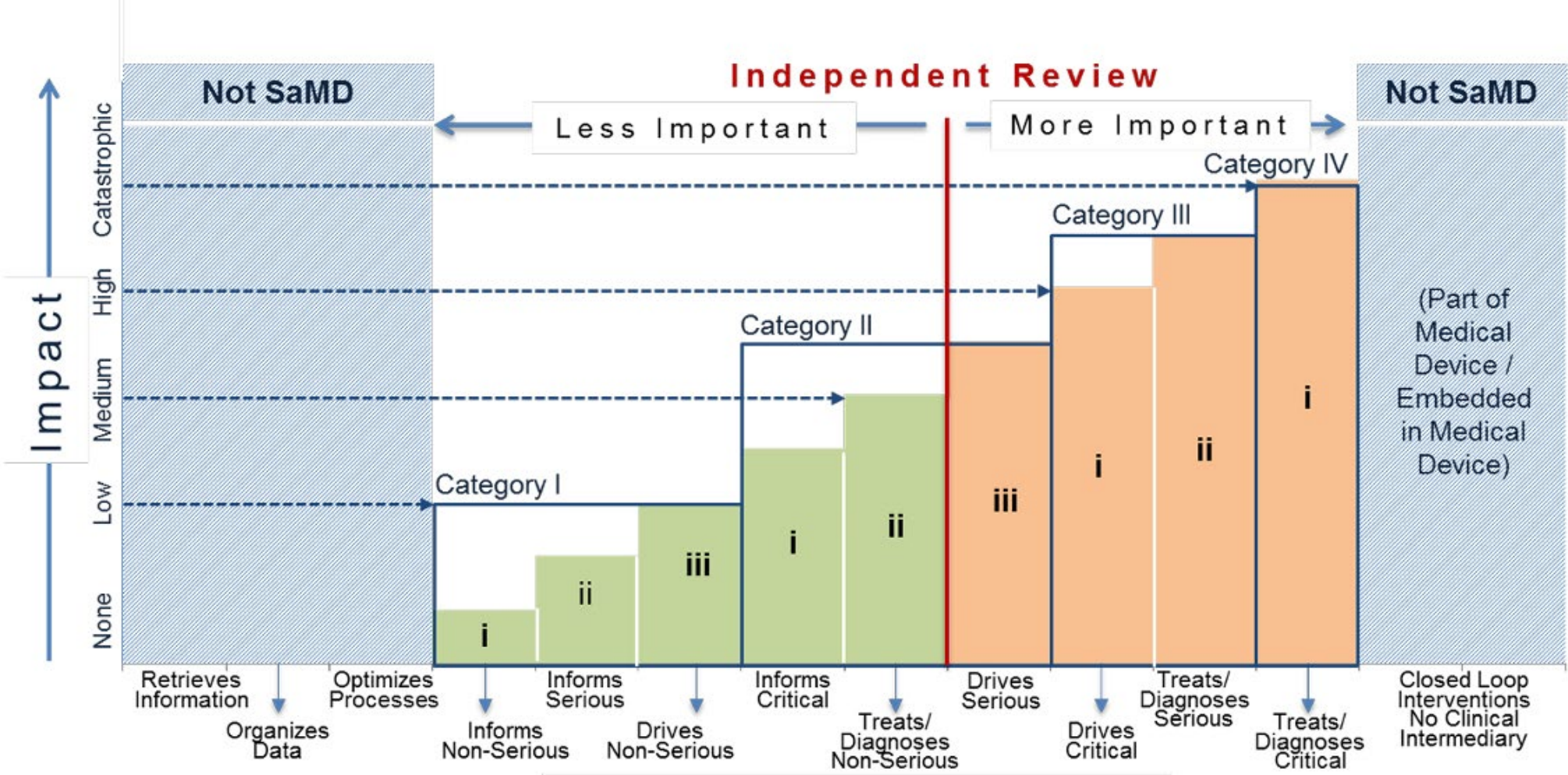
 Examples of measures of clinical validation

- Sensitivity
- Specificity
- Positive predictive value (PPV)
- Negative predictive value (NPV)
- Number needed to treat (NNT)
- Number needed to harm (NNH)
- Likelihood ratio negative (LR-)
- Likelihood ratio positive (LR+)
- Odds ratio (OR)
- Clinical usability / User Interface
- Confidence interval

#### Question: How do I “generate evidence”?

You can generate evidence to validate clinical significance during verification and validation activities as part of your quality management system or as part of your good software engineering practices, referencing existing data sources from studies conducted for the same intended use. Where available data references studies conducted for a different intended use, extrapolation or generation of new clinical data may be required.

# The Winners Will Solve Big Problems!

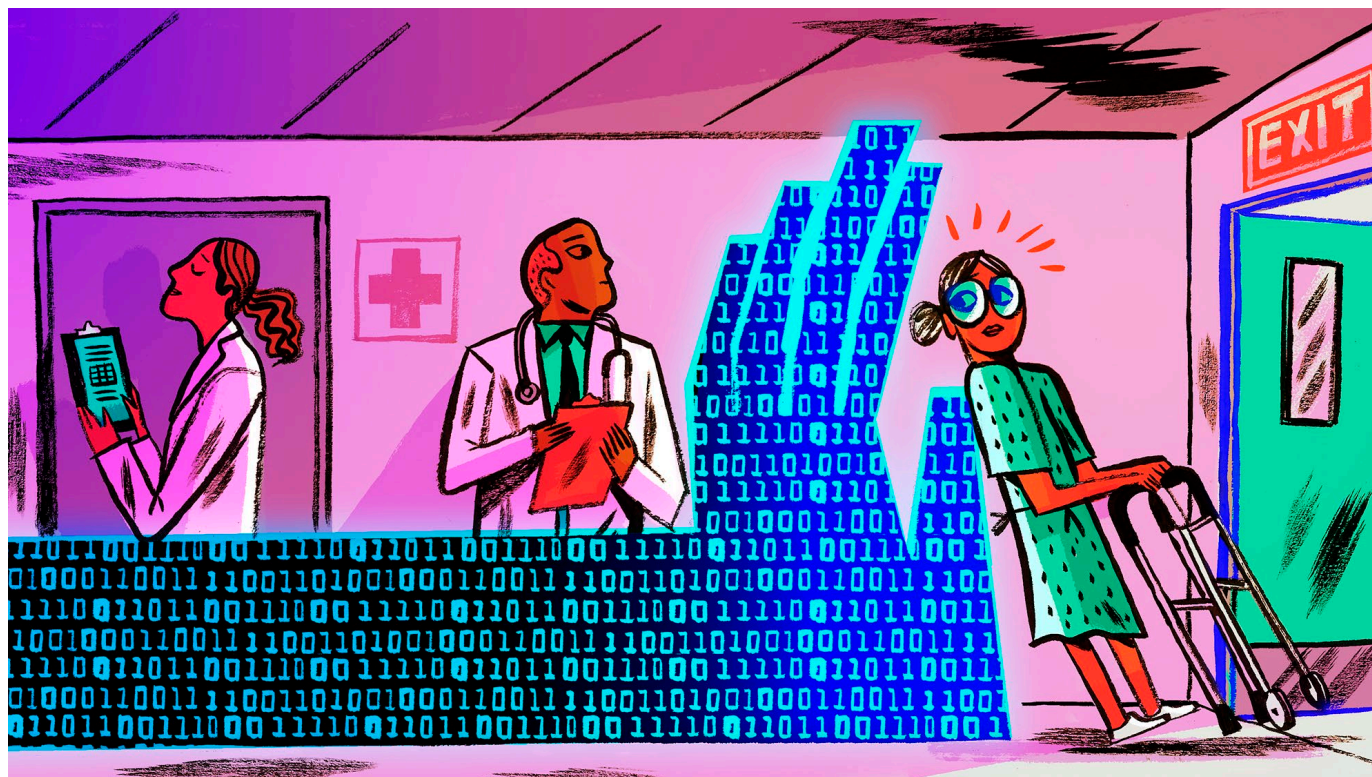


A STAT INVESTIGATION

# Denied by AI: How Medicare Advantage plans use algorithms to cut off care for seniors in need



By [Casey Ross](#) and [Bob Herman](#) March 13, 2023





POLICY-ISH

# Someone could steal your medical records and bill you for their care

July 26, 2023 · 5:00 AM ET

FROM **KFF** Health News

By Michelle Andrews



HCA Healthcare, a for-profit hospital company headquartered in Nashville, Tenn., had a huge data breach it acknowledged this month, exposing the medical records of 11 million people.

*Rusty Russell/Getty Images*

Consumers should realize that such "medical identity" fraud can happen in several ways, from a large-scale breach to individual theft of someone's data.

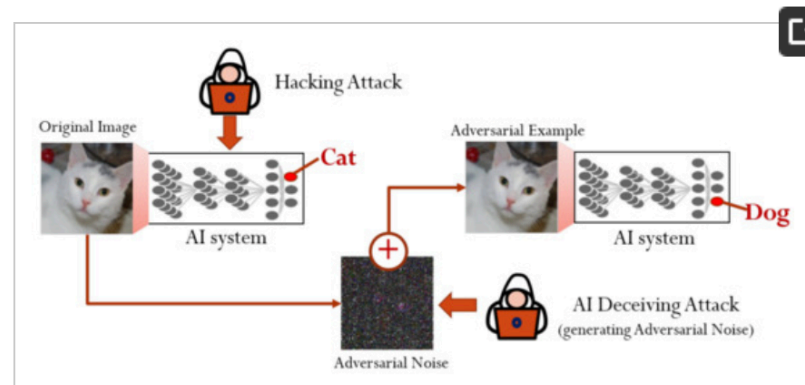
Just ask Evelyn Miller. The first sign something was amiss was a text Miller received from an Emory University Hospital emergency department informing her that her wait time to be seen was 30 minutes to 1 hour. That's weird, she thought. She no longer lives in Atlanta and hadn't used that hospital system in years. Then she got a second text, similar to the first. Must be spam, she thought.

When she got a call the next day from an Emory staffer named Michael to discuss the diagnostic results from her ER visit, she knew something was definitely wrong. "It amazed me someone could get registered with another person's name and no ID was checked or anything," Miller says.

# Real-Time Adversarial Attack Detection with Deep Image Prior Initialized as a High-Level Representation Based Blurring Network

by  Richard Evan Sutanto <sup>1</sup>   and  Sukho Lee <sup>2,\*</sup>  

The adversarial noise is a carefully designed small perturbation that can lead the neural network to make a wrong decision when added to the original input to the network. The combination of the original input with the adversarial noise is called an adversarial example. Using such an adversarial example to intentionally malfunctioning the AI system is called an AI deception attack. The seriousness of such an AI deception attack lies in the fact that the deception attack can be made without breaking into the system through abnormal routes. This is in contrast to hacking attacks that intrude into the system through abnormal routes. Therefore, even an AI system that is secure against hacking attacks can be attacked by adversarial examples coming through normal channels. **Figure 1** shows the concept of an AI deception attack. Even though the noise added to the image is small so that in the eye of the human the original image and the adversarial example look similar, the neural network gives different decisions to the two images. This kind of adversarial example can arouse critical harms to the system which depends on the decision of the neural network.



**Figure 1.** Concept of artificial intelligence (AI) deceiving attack. A small adversarial noise added to the original image can make the neural network to classify the image as a Guacamole instead of an Egyptian cat. This is in contrast to a hacking attack that intrudes the system through an abnormal route.



**æɹɔʞ**  
@TheTarquin · Follow



For all the DefCon folks staying in Caesar's: the VIP override for the Honeywell thermostat in your room is:

- While holding down "display"
- Press "off"
- Press "Up" arrow
- Release "display" button

Disables room occupancy sensor and lowers min temp setting.

6:38 PM · Aug 8, 2018



2.5K Reply Copy link to Tweet

Read 62 replies



**allan sto**  
@allansto · Follow



. @bhoenadel i see your bluescreen, and raise you...



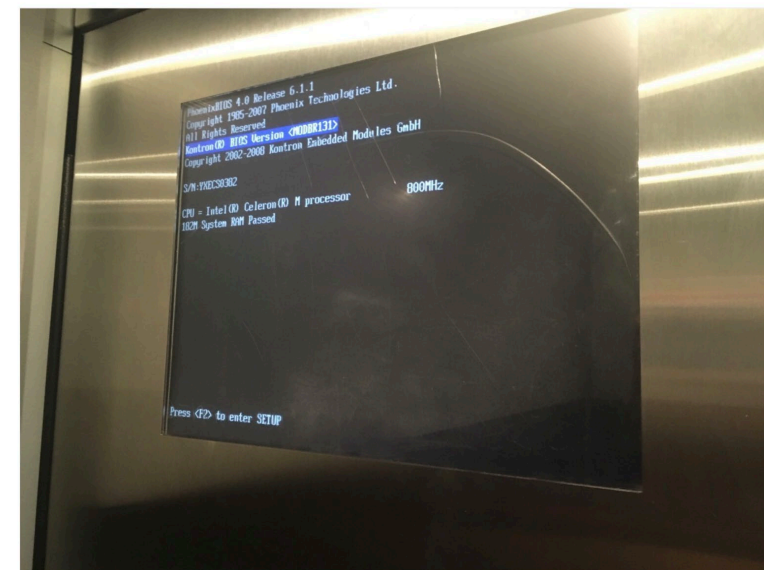
1:06 AM · Aug 9, 2018



34 Reply Copy link to Tweet

Read 4 replies

Or, if that's a little too private for you, how about trying to hack The Flamingo's elevator?



Oops. Credit: Jack Morse/mashable

[nature](#) > [nature medicine](#) > [comment](#) > [article](#)

Comment | [Published: 09 February 2023](#)

## Characterizing cyber harms from digital health

[Eric D. Perakslis](#), [Megan L. Ranney](#)  & [Jennifer C. Goldsack](#)

[Nature Medicine](#) (2023) | [Cite this article](#)

**977** Accesses | **21** Altmetric | [Metrics](#)

**The expansion of digital health comes with benefits, but also potential harms, including those to economic, psychological and societal wellbeing. This article presents a framework to characterize cyber harms so that they can be prevented and mitigated.**

## Table 2 Case studies of digital health harms and potential mitigating strategies

From: [Characterizing cyber harms from digital health](#)

Example of harm	Technical vector (2020 incidence)	Regulator/enforcement (US)	Assessment framework or case study	Further reading
Intimate partner violence	Stalkerware (up 780%)	FTC, law enforcement	<a href="#">The Danger Assessment</a>	<a href="#">Freed, D. et al.</a>
Care disruption	Cyberattack (up 141%)	HHS, DHS, law enforcement	<a href="#">Baby Kidd</a>	<a href="#">Perakslis, E.</a>
Identity theft	Malware (up 100%)	HHS, FTC, law enforcement	<a href="#">Carlos from San Antonio</a>	<a href="#">Federal Trade Commission</a>
Loss of employment or underemployment	Stolen data (33% of victims)	DoJ, but unclear	<a href="#">Alexis Moore</a>	<a href="#">Identity Theft Resource Network</a>
Fraud and tax burden	Stolen data	IRS, FTC	<a href="#">Tax consequences of identity theft</a>	<a href="#">Taxpayer Advocate Service</a>
Criminal record	Physically stolen data for fraud	HHS, DoJ, law enforcement	<a href="#">Deborah Ford</a>	<a href="#">HHS OIG</a>
Loss of reproductive privacy	Data brokers	HHS, FTC, but unclear	<a href="#">32 brokers selling billions of profiles</a>	<a href="#">Al Ghadeer, H.A. et al.</a>

## Top US cyber official warns AI may be the 'most powerful weapon of our time'

CISA Director Jen Easterly said the rapid advances in technologies such as ChatGPT could be used by adversaries to carry out cyberattacks.

BY [CHRISTIAN VASQUEZ](#) • MAY 5, 2023



CISA Director Jen Easterly spoke at the CrowdStrike Government Summit on April 11. (Pixelme Studio)

Application Security | 3 MIN READ | NEWS

## 'DarkBERT' GPT-Based Malware Trains Up on the Entire Dark Web

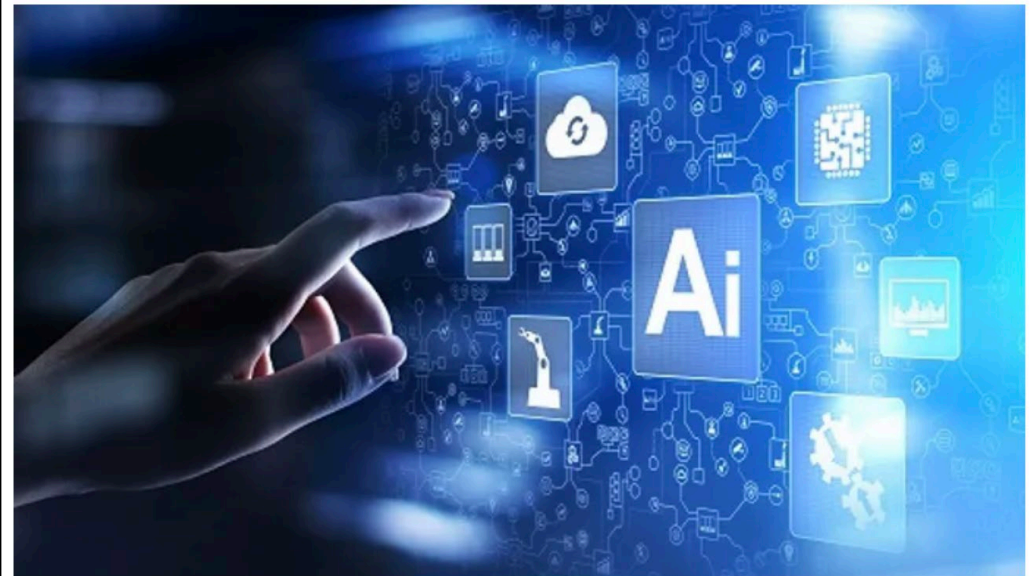
The DarkBART and DarkBERT cybercriminal chatbots, based on Google Bard, represent a major leap ahead for adversarial AI, including Google Lens integration for images and instant access to the whole of the cyber-underground knowledge base.



**Elizabeth Montalbano**

Contributor, Dark Reading

August 01, 2023



Source: WrightStudio via Adobe Stock Photo

# AI Village Capture the Flag @ DEFCON

Hack AI! Collect flags by evading, poisoning, stealing, and fooling AI/ML

\$25,000

Prize Money



AI Village · 668 teams · a year ago

CTF's are inherently puzzles that are intended to challenge you and help you learn new things. Sometimes they may be a little ambiguous or misleading. That's part of the challenge! Competitors will be interacting with API endpoints or code/objects stored in the `input` directory during each of the challenges. Upon successful completion of a challenge, that challenge will return a flag

**Math Challenges:** Four challenges to explore the concept of dimensionality.

**Hotdog and Hotterdog:** Dogs, wieners, and classifiers. What more could you want?

**bad2good:** Can you poison a dataset to change how something is classified?

**baseball:** Can you impersonate someone else by throwing the correct distribution of pitches?

**crop:** Two challenges to test your ability to manipulate an image cropping model.

**deepfake:** There's a nasty deepfake getting detected out there, can you help it?

**honorstudent:** Can you change an image of an F to look like an A? Why would someone want to do such a thing?

**salt:** This model has some pretty advanced defenses. Can you evade it anyway?

**theft:** Can you steal this model to get a sneaky owl past it?

**token:** Sentiment Analysis. Who needs?

**waf:** A web-app-firewall blocks malicious requests. Can you discover and by-pass the 0-day?

**forensics:** Nice artifact you got there, shame if there was a flag in it

**leakage:** Get a password out of a model, is that even possible?

**murderbot:** Save the humans, escape the bots!

**wifi:** Can you pull your wifi password out of the embedding?

## HEALTH AFFAIRS FOREFRONT

## RELATED TOPICS:

PUBLIC HEALTH | ACCESS TO CARE | COVID-19 | VACCINES | ETHICS | TECHNOLOGY | MEDICAL DEVICES  
| INTERNET

# The Critical Link Between Health Care Cybersecurity And Health Disinformation

[Eric D. Perakslis](#), [Megan L. Ranney](#), [Jennifer C. Goldsack](#)

OCTOBER 13, 2022

10.1377/forefront.20221012.247753



[nature](#) > [humanities and social sciences communications](#) > [articles](#) > [article](#)

Article | [Open Access](#) | [Published: 25 June 2019](#)

## Fake news game confers psychological resistance against online misinformation

[Jon Roozenbeek](#) & [Sander van der Linden](#) [✉](#)

*Palgrave Communications* 5, Article number: 65 (2019) | [Cite this article](#)

105k Accesses | 196 Citations | 1940 Altmetric | [Metrics](#)

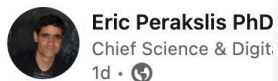
**i** A [Correction](#) to this article was published on 29 August 2019

**i** This article has been [updated](#)

### Abstract

The spread of online misinformation poses serious challenges to societies worldwide. In a novel attempt to address this issue, we designed a psychological intervention in the form of an online browser game. In the game, players take on the role of a fake news producer and learn to master six documented techniques commonly used in the production of misinformation: polarisation, invoking emotions, spreading conspiracy theories, trolling people online, deflecting blame, and impersonating fake accounts. The game draws on an inoculation metaphor, where preemptively exposing, warning, and familiarising people with the strategies used in the production of fake news helps confer cognitive immunity when exposed to real misinformation. We conducted a large-scale evaluation of the game with  $N=15,000$  participants in a pre-post gameplay design. We provide initial evidence that people's ability to spot and resist misinformation improves after gameplay, irrespective of education, age, political ideology, and cognitive style.





**Eric Perakslis PhD**  
Chief Science & Digit  
1d · 🌐

Looking forward to this.



**NIH Pragmatic Tri**  
57 followers  
1d · 🌐

Want to play a game? This [Duke University School of Medicine](#) machine learning in clinical

[#artificialintelligence](#) [#machinelearning](#) [#pctGR](#)



August 2, 2023: Want to attend this week's PCT Grand Round? [rethinkingclinicaltrials.org](https://rethinkingclinicaltrials.org) · 1

## Your Text is AI/GPT Generated

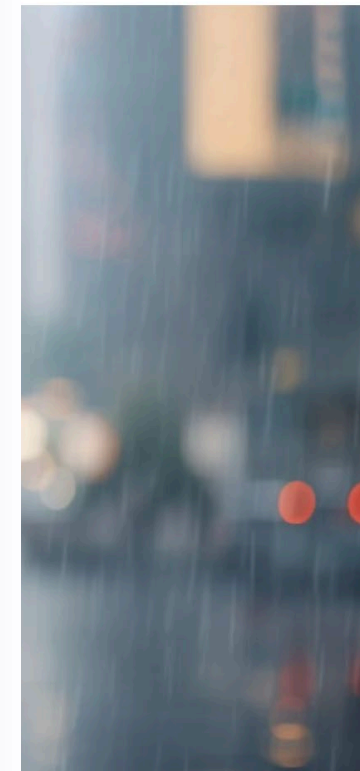


Dr. Eric Perakslis from Duke University will be presenting "AI & ML: Want to Play a Game?" in this week's PCT Grand Rounds session. The session will take place on Friday, August 4, 2023, at 1:00 pm Eastern Time. Dr. Perakslis is a professor in population health sciences and the chief research technology strategist at the Duke University School of Medicine.

During the session, Dr. Perakslis will delve into the world of artificial intelligence and machine learning. These technologies have gained significant attention and are being applied in various fields, including healthcare. Dr. Perakslis will discuss the potential of AI and ML in transforming the healthcare industry and improving patient outcomes.

Artificial intelligence refers to the development of computer systems that can perform tasks that typically require human intelligence. Machine learning, on the other hand, involves algorithms and statistical models that allow computers to learn and improve from experience without being explicitly programmed.

The utilization of AI and ML in healthcare holds immense promise. They can potentially assist in



s PCT Grand Rounds session. The population health sciences and

# “Patients are Waiting!” *Dr Paul Janssen*

