

# AI & ChatGPT

## What lies ahead in medicine?

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Roche Information Solutions

# Why we are here today

ChatGPT's first announcement - and 5 months later

**ChatGPT [...]** is trained to follow an instruction in a prompt and provide a detailed response.<sup>1</sup>

November 2022

**GPT-4 [...]** exhibits human-level performance on various professional and academic benchmarks.<sup>2</sup>

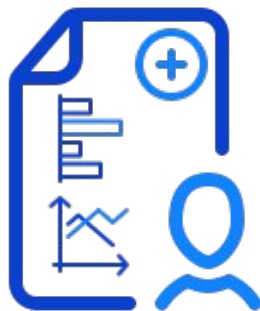
March 2023

1. <https://openai.com/blog/chatgpt>

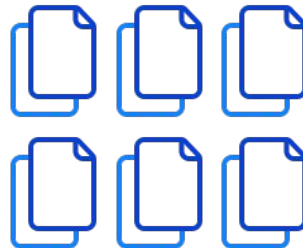
2. <https://openai.com/research/gpt-4>

# Why we are here today as well

Need for AI to address the increasing complexity and data overload



Healthcare data is large & complex<sup>1,2</sup>



Average Lifetime  
Healthcare Data  
Generation:  
1 million Gigabytes<sup>3,4</sup>



Processing of abnormal  
data associated with  
morbidity & mortality<sup>5-8</sup>

1. Jakimowicz and Cuschieri. Surg Endosc 2005;19(12):1521-2.

2. Bitterman. J Clin Monit Comput 2006;20(3):165-2015;35(4):539-57.

3. Ahmed et al. IEEE Pulse 2017;8(2):4-9.

4. O'Reilly-Shah et al. Br J Anesth 2020;125(6):843-62.

5. Blumenthal-Barby and Krieger. Med Decis Making

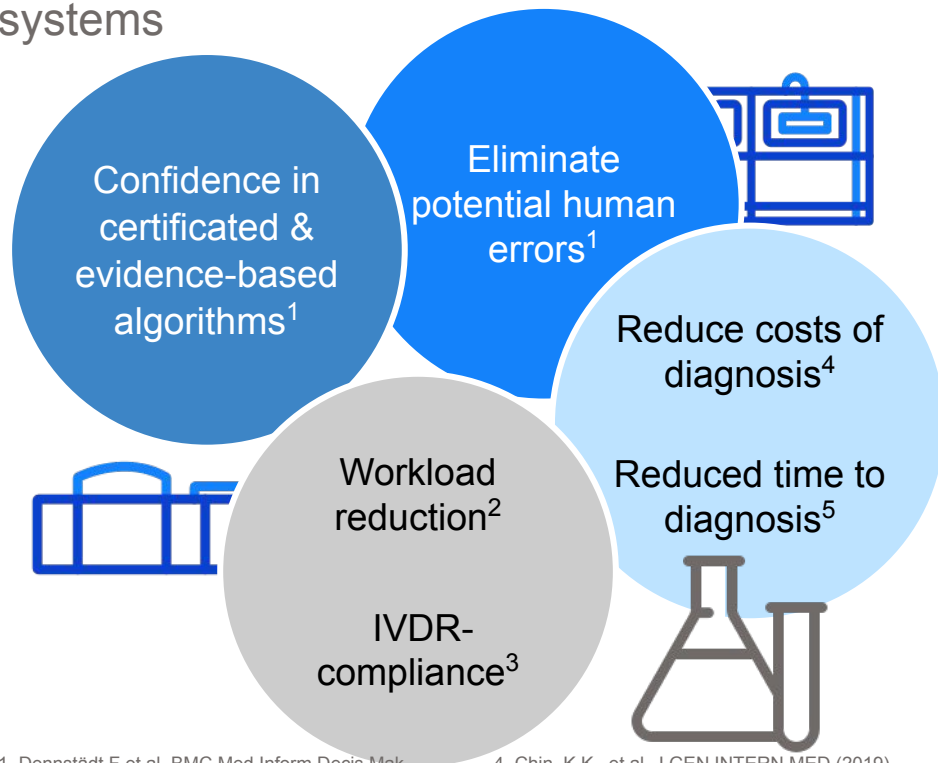
6. Wolf et al. JAMA 1985;252(10):2858-62.

7. Graber et al. Arch Intern Med 2005;165(13):1493-9.

8. Kirch and Schaffli. Med 1996;75(1):29-40.

# Why you should stay

AI promises high value for providers as well as patients and healthcare systems



## Additional benefits<sup>5</sup>

- ➡ Higher adherence to guidelines
- ➡ Cost savings for payers

1. Dennstädt F et al. BMC Med Inform Decis Mak. 2021;21:212

2. Bertelsmann Stiftung. Algorithms in digital healthcare 2019.

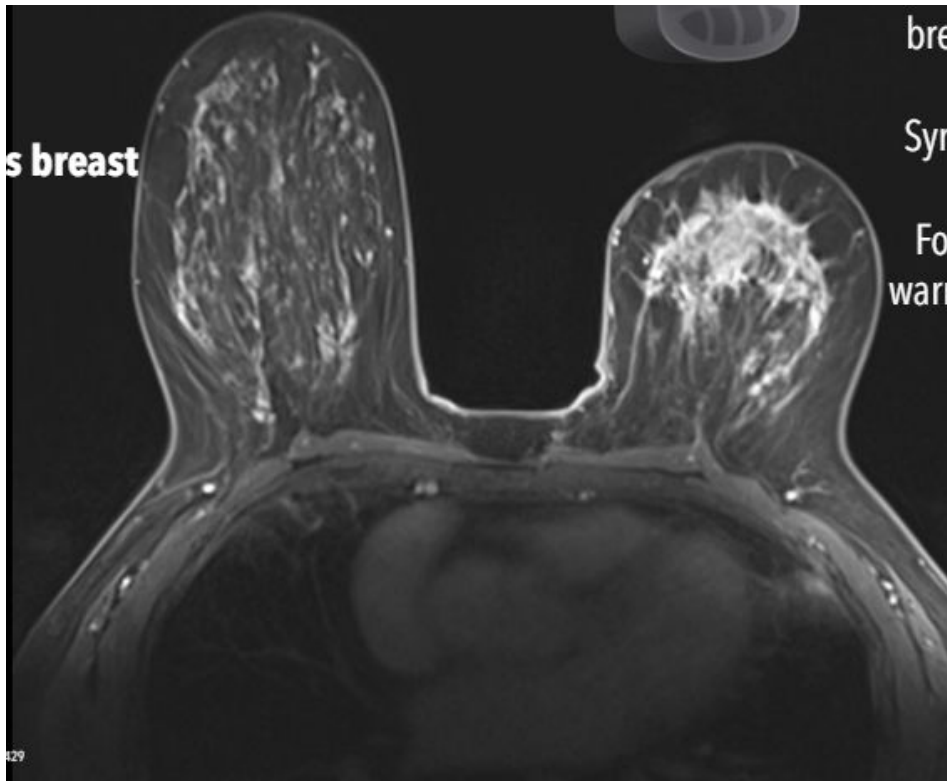
4. Chin, K.K., et al. J GEN INTERN MED (2019)

5. Sutton et al. NPJ Dig Med 2020;3:17.

# What is AI already capable of today?

## Evaluation of MRI-images: Doctor vs. Chatbot

*“An extremely obvious breast cancer on MRI.”*



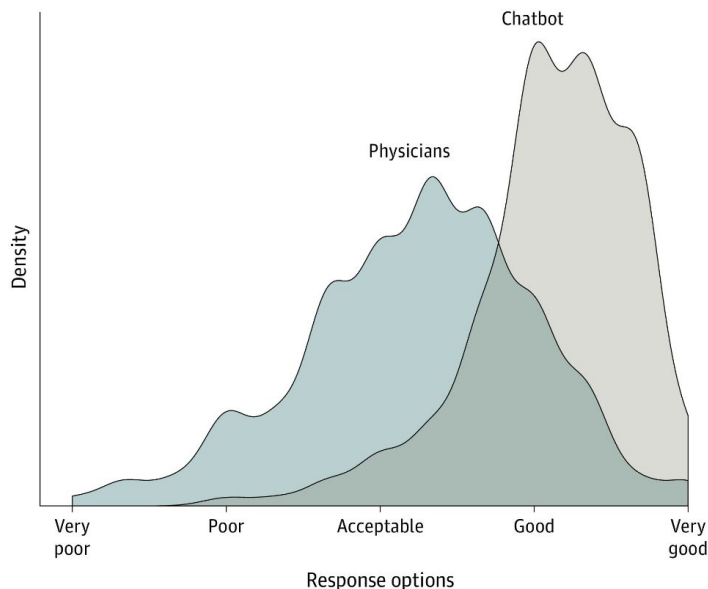
*“Axial T2-weighted breast MRI. Heterogeneous enhancement in both breasts with no definitive masses detected. Symmetrical fibroglandular tissue patterns noted. Follow-up imaging may be warranted to ensure stability and exclude any subtle pathology.”*

# What is AI already capable of today?

## Evaluation of typical questions of patients: Doctor vs. Chatbot

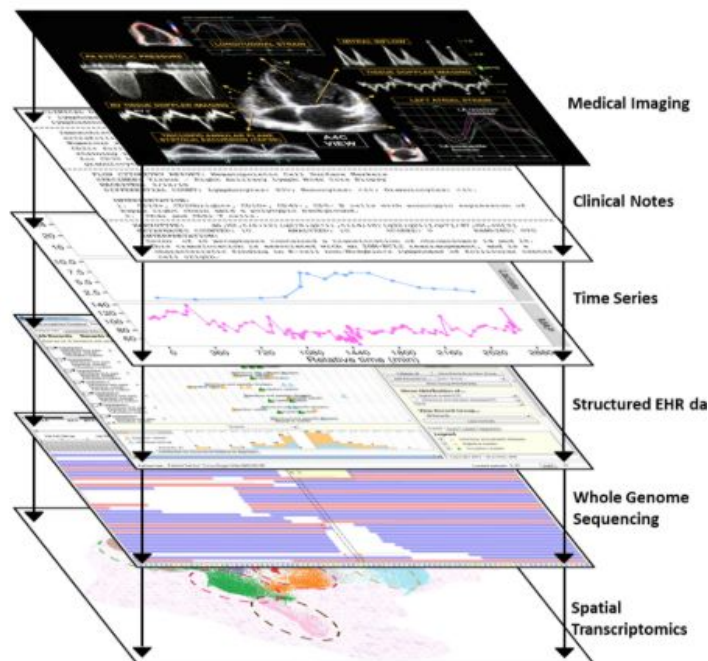
Distribution of the average quality and empathy rating

**A** Quality ratings



# What is AI not yet capable of today?

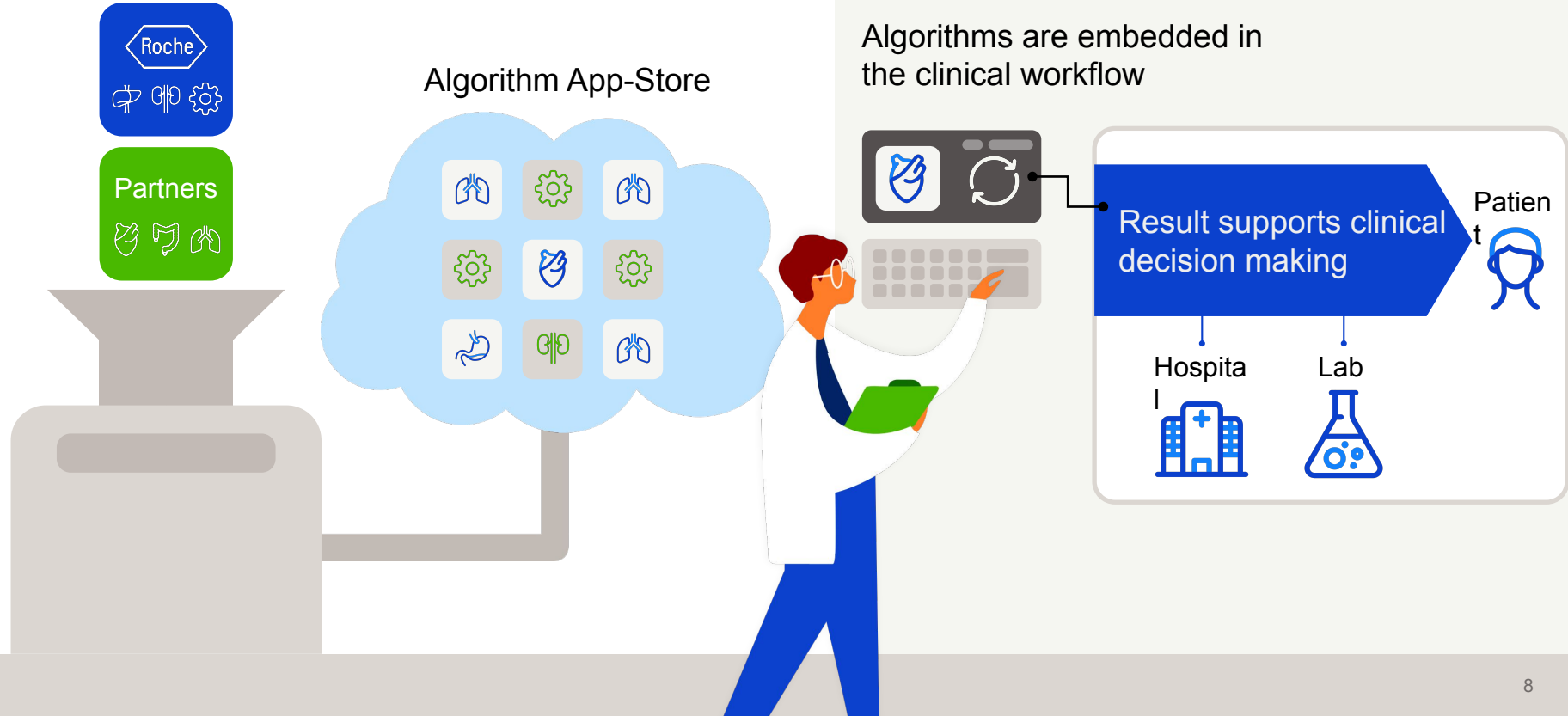
Unstructured data, lack of evidence & no regulation





# navify<sup>®</sup> Algorithm Suite

The one stop shop for medical algorithms





# How is the diagnostic industry dealing with it?

Iteration of create & test along the holistic patient care process

## Risk for colon cancer

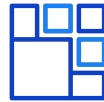
CDS for a personalized recommendation for colorectal cancer screening



- Machine learning
- Existing blood parameters (CBC) of each patient
- Validation of desirability & feasibility

## Patient-based real time QC

Leveraging patient data to detect real time quality control issues of analyzers



- Natural language processing
- Individual real-time patient data set
- Efficiency gains

## Artefact detection & correction

Automated quality control for tissue scans & removal of artifacts



- Machine learning
- AI model's robustness
- Efficiency gains

## Clinical evidence monitor

Automated detection of clinical evidence in unstructured documents



- Natural language processing & text mining
- Quick assessment with more relevant evidence in oncology
- Medical outcome

## Aid in liver cancer diagnosis

CDS for more confidence in the diagnosis of HCC for high risk patients



- Mathematical regression
- Existing immunology parameters of each patient
- Validation of viability



Screening



Laboratory



Pathology



Treatment



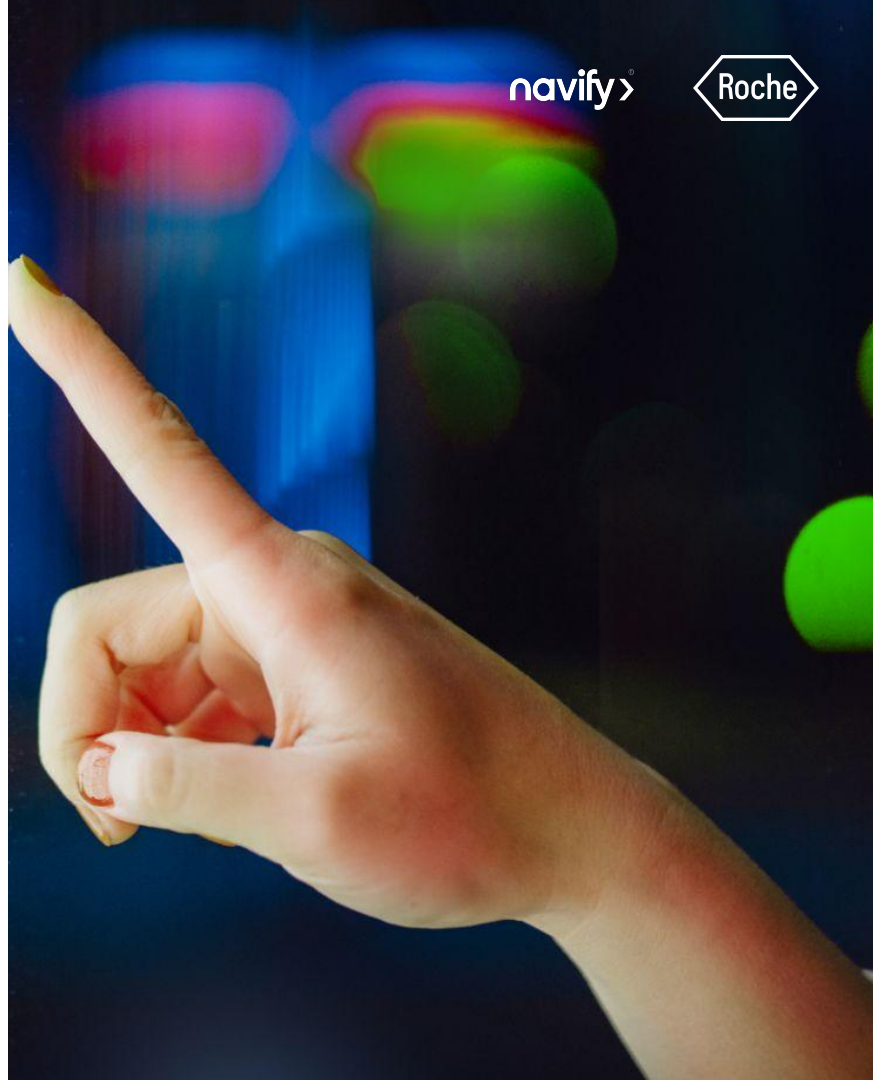
Surveillance

# ChatGPT...

- Changed our understanding of AI sustainably
- Not yet part of everyday care in healthcare systems

## ChatGPT in medicine

- is only to be evaluated as clinical decision support
- can only be used as a "digital biomarker"
- must be explainable in order to generate user's acceptance
- is approved as a medical device with corresponding evidence



Doing now what patients need next