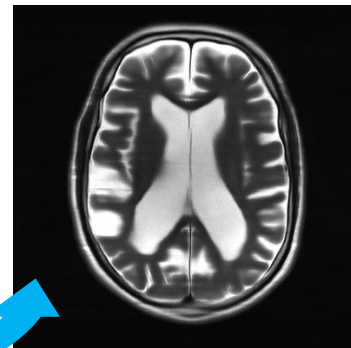
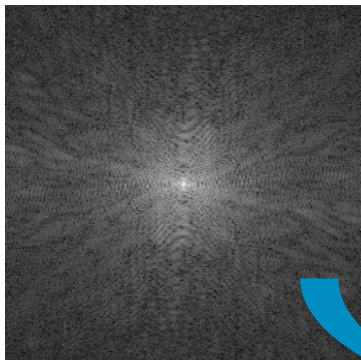


AI Advancements in Radiology, Image Analysis, and Diagnosis in Research

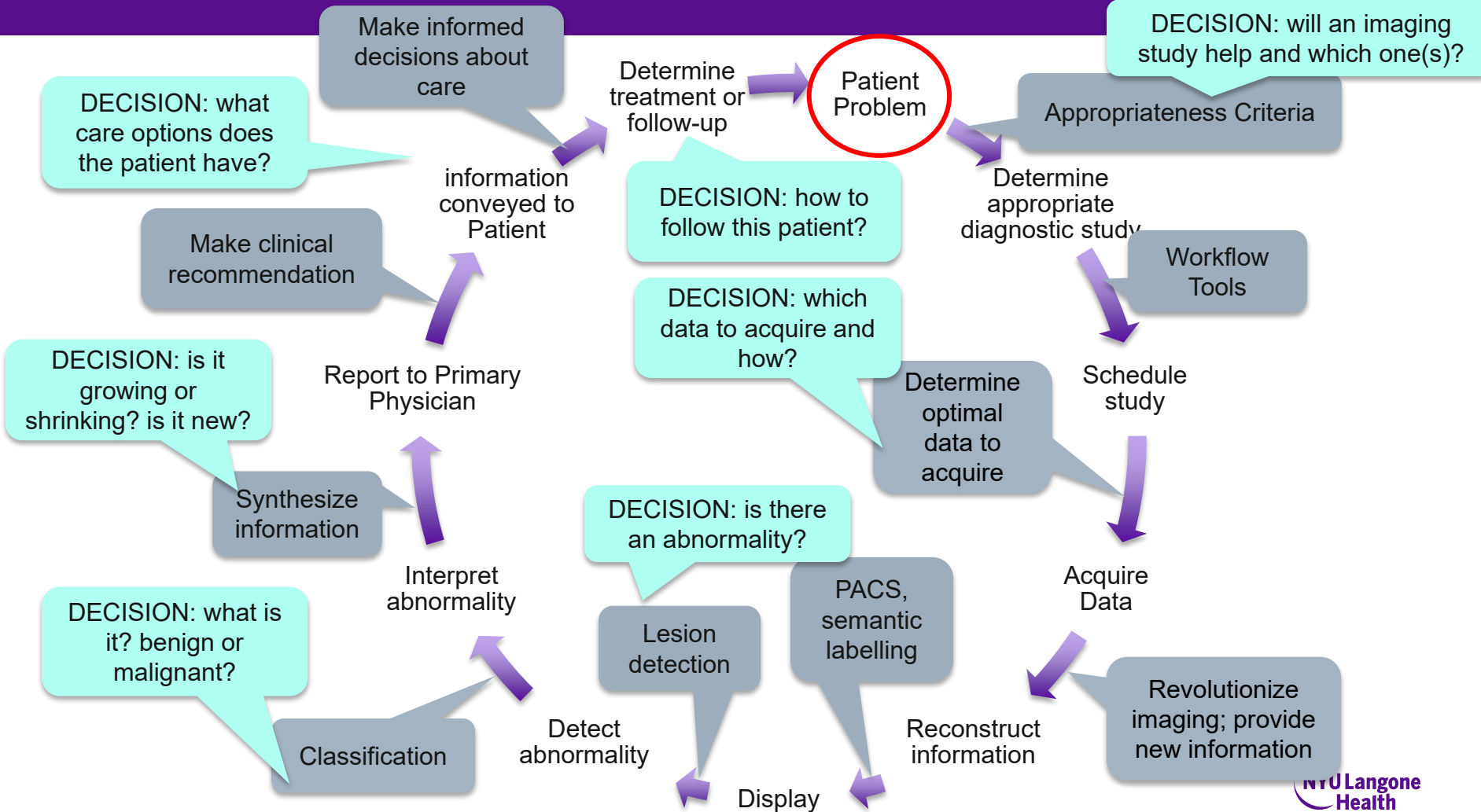
Yvonne W. Lui MD FACR

National Academy of Sciences
FORUM ON ADVANCING
DIAGNOSTIC EXCELLENCE
July 27, 2024



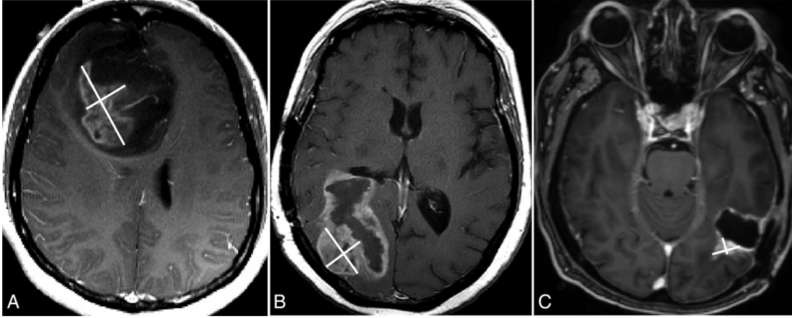
Disclosures

- no financial disclosures
- lead collaboration partner at NYULH w/ Facebook AI Research, Siemens Healthineers



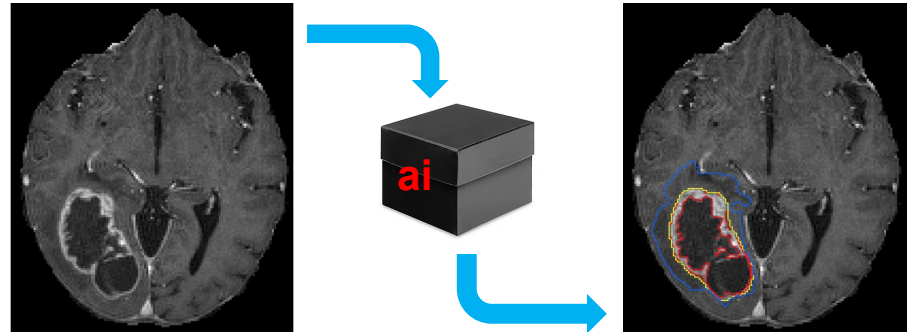
Case 1: Segmentation

CLINICAL DECISION: is there progressive disease? how should we treat?



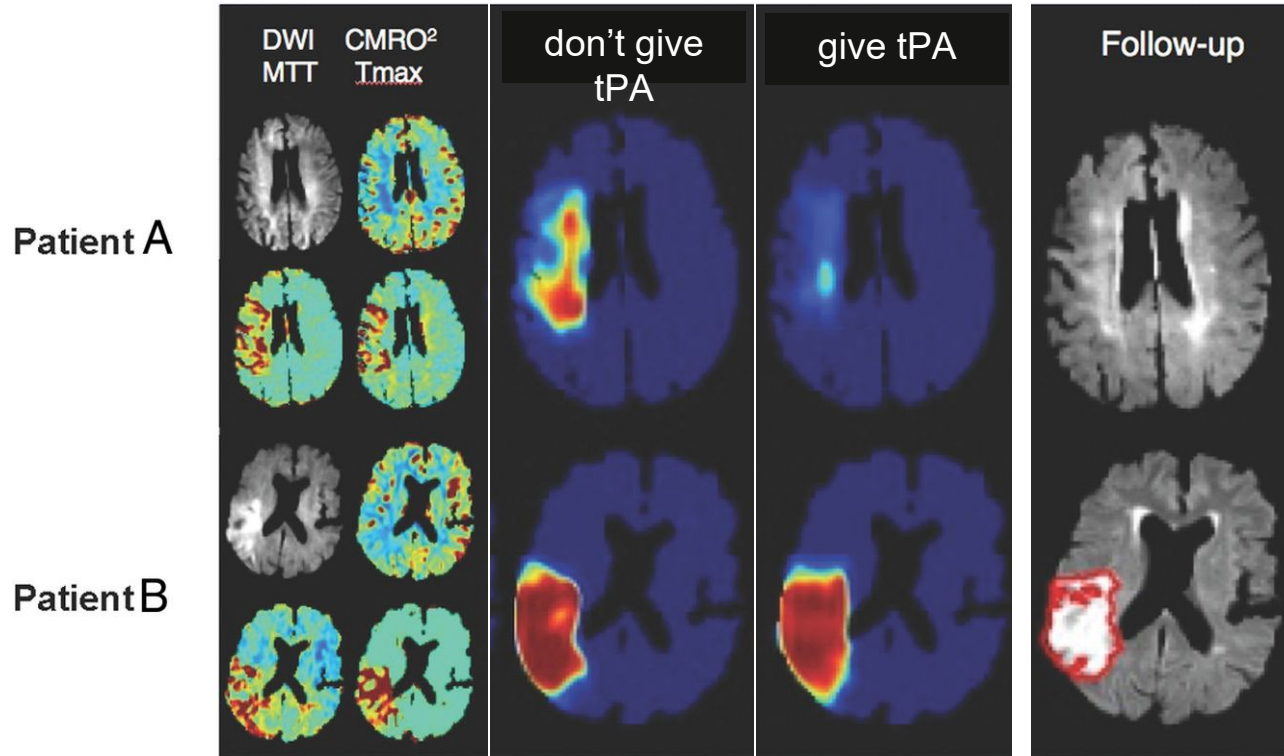
traditional

deep learning-based



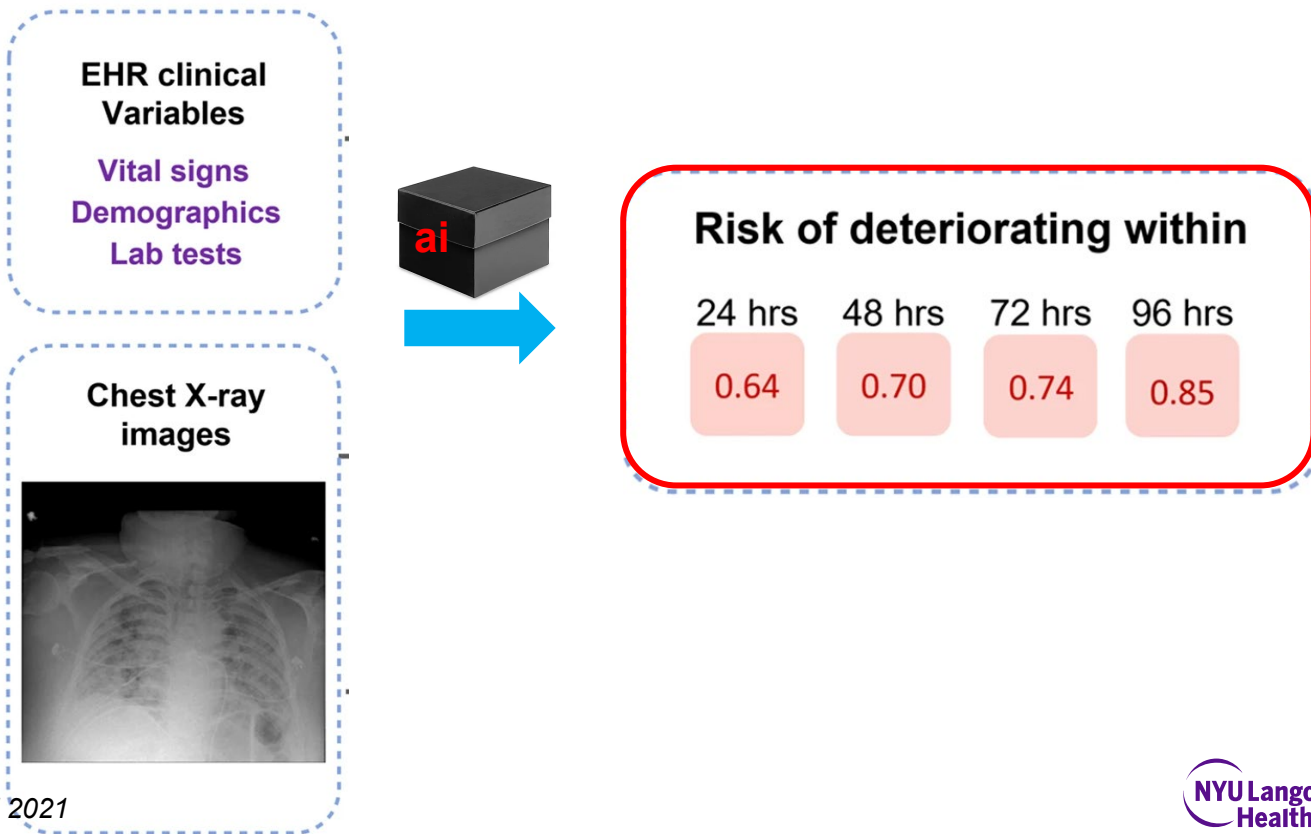
Case 2: Predict Outcome

CLINICAL DECISION: Which patient benefits from treatment?



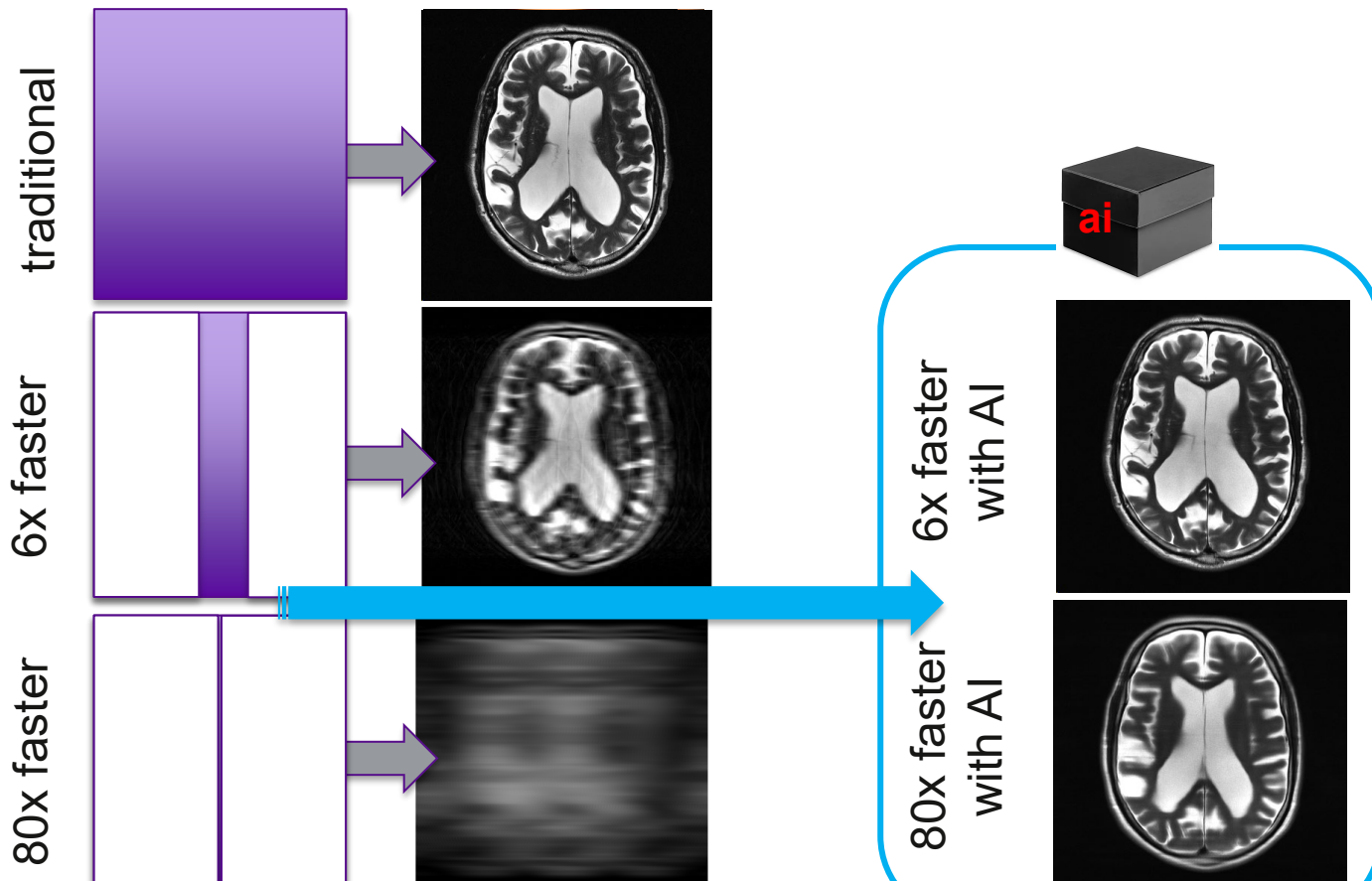
Case 2b: Predict Outcome

CLINICAL DECISION: Who needs to be admitted?



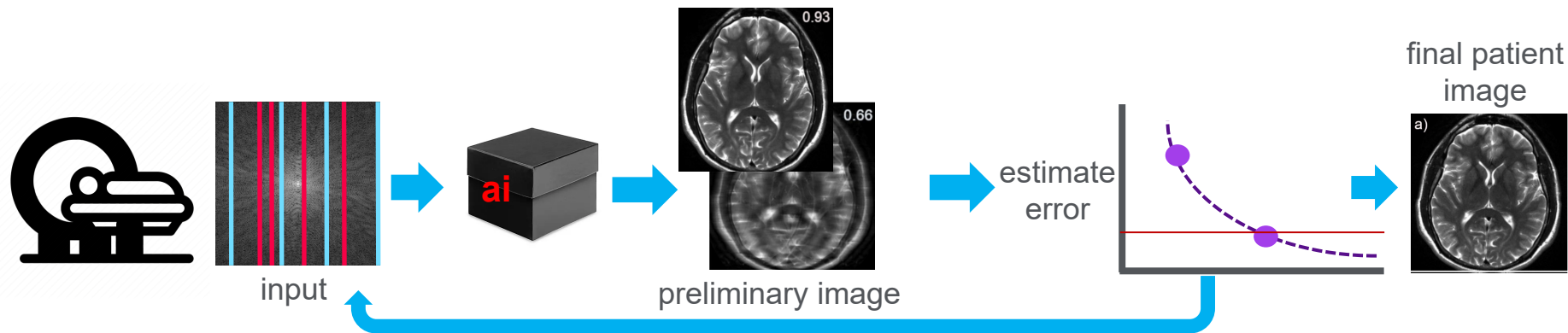
Case 3: Creating Images

CLINICAL DECISION: How much and what data to acquire?



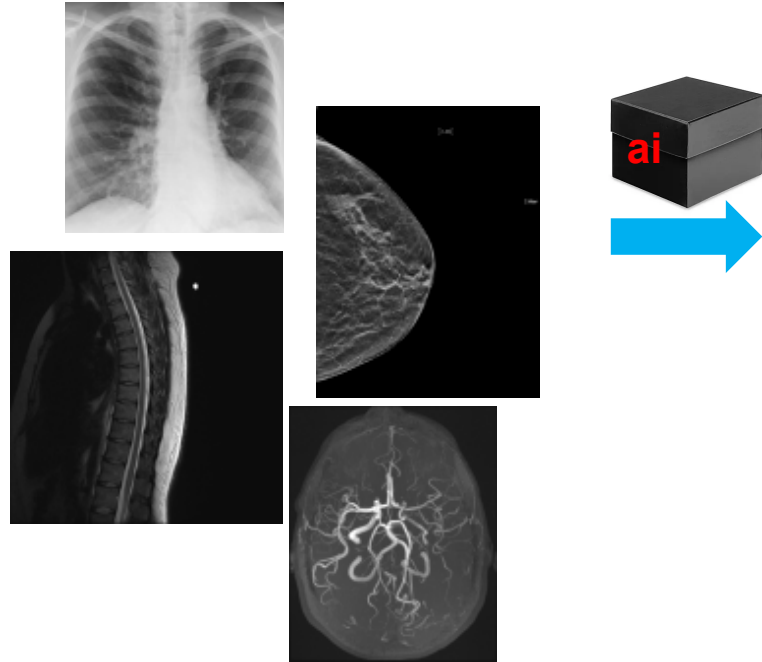
Case 3: Creating Images

CLINICAL DECISION: How much and what data to acquire?



Case 4: classifying images

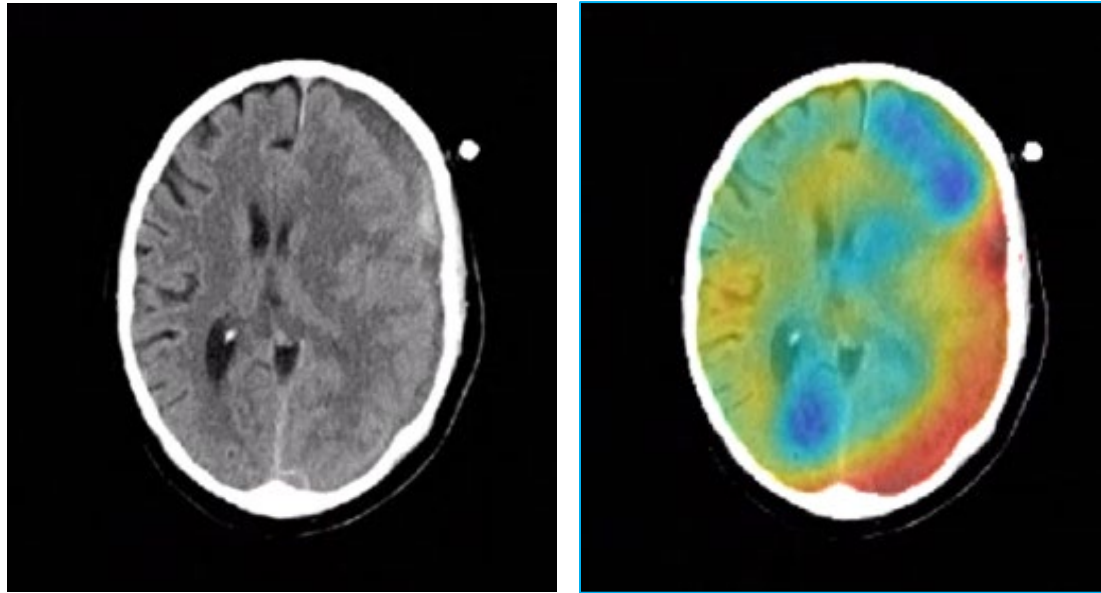
CLINICAL DECISION: What is it?



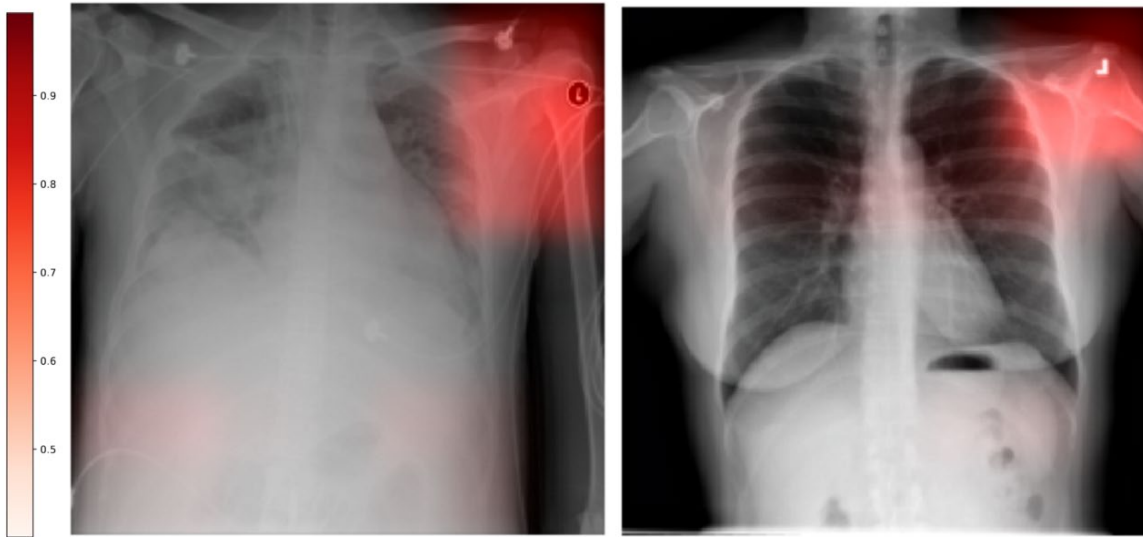
- Tumor or No Tumor?
- Normal or Abnormal?
- What is it? Middle cerebral artery occlusion? Ductal carcinoma in situ? Pneumonia? Metastatic disease?



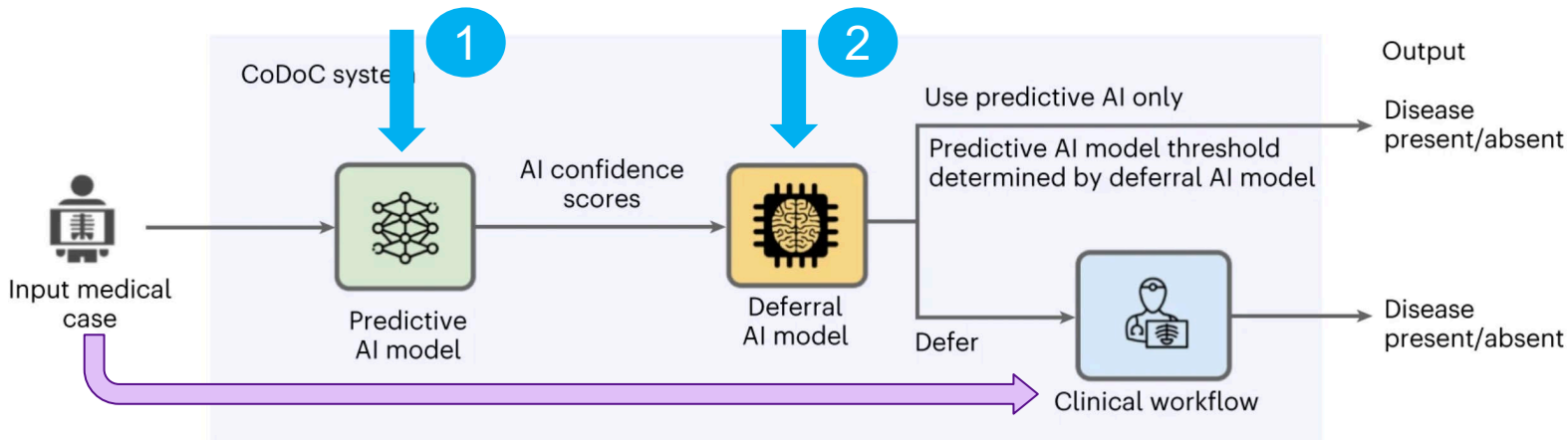
Attention maps can help us understand where AI is “looking”



Pneumonia detector



AI to interpret the AI



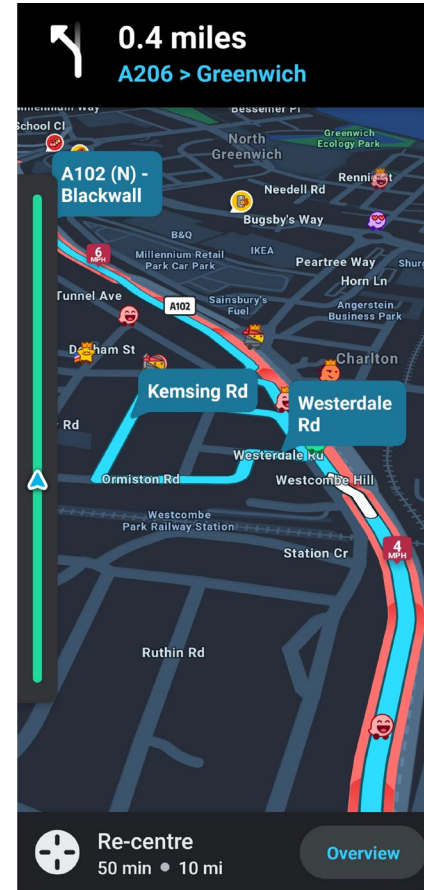
Krishnamurthy et al, Google DeepMind, Nature Med 2023

Whitney Wolfe Herd [founder of Bumble and Tinder] offered a solution for the future of dating: AI. Wolfe Herd envisioned a scenario where an app user's AI "dating concierge" would "date" other people's AI concierges, recommending the best matches. People's [reactions:] malaise, amusement, and horror, some pointing out that this was a plot point in a dystopian Netflix series.

- S. Mathews (Harpers)

Summary

- Many points where AI can help make clinical decisions
- Classification, yes; but urge you to consider other potentially powerful applications
- Understand these tools to use them better
- There are limitations to these tools
- Following blindly (in life and in medicine) may not be advantageous



Krzysztof Geras, PhD
Florian Knoll, PhD
Eyal Lotan, MD PhD
Marcelo Zibetti, PhD
Eric Oermann, MD PhD

Michael Recht, MD
Dan Sodickson, MD PhD

P41EB0171 PI Sodickson
R01 NS131458 PI Lui
R01 NS119767 PI Lui
R01 EB024532 PI Knoll / Johnson



Thank you!