

A decorative graphic in the top-left corner consisting of stylized circuit lines in light blue and red. The lines are of varying thickness and form a complex, angular pattern. There are several small circles, some solid and some hollow, interspersed among the lines. A small red circle is prominent near the top center of this graphic.

Discussion 1

Developer Knowledge

A decorative graphic in the bottom-right corner, mirroring the style of the top-left graphic. It features stylized circuit lines in light blue and red, with various geometric shapes and small circles. The lines are more horizontal and spread out towards the right edge of the slide.

Recap of Case Study

- Your AI model has been deployed in the local hospital's emergency department
- Model automates the ordering of tests (this speeds up – and standardizes) how we deliver care
- Model was validated with a **92% accuracy**
- *Each group has a different model architecture, with different development and validation processes*

Clinical Knowledge in Development

- Developers use clinical dataset
- Developers determine when and how a model can be used in clinical workflows through the data required for the model to run
- Developers determine what utility / value the model bring by specifying what the model's output is and how it is communicated



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Discussion 1

What clinical knowledge
would developers need?

Remember to consider the type of model that you have

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TIME TO SHARE WITH THE LARGE GROUP



Share both overall thoughts – as well as those specific to your model's architecture and validation process

LARGE GROUP DISCUSSION

Consider your model type in communicating your thoughts to the group

»» **Model A**

Non-Generative Model

»» **Model B**

Non-generative, Image-based Model

»» **Model C**

Multimodal Model

»» **Model D**

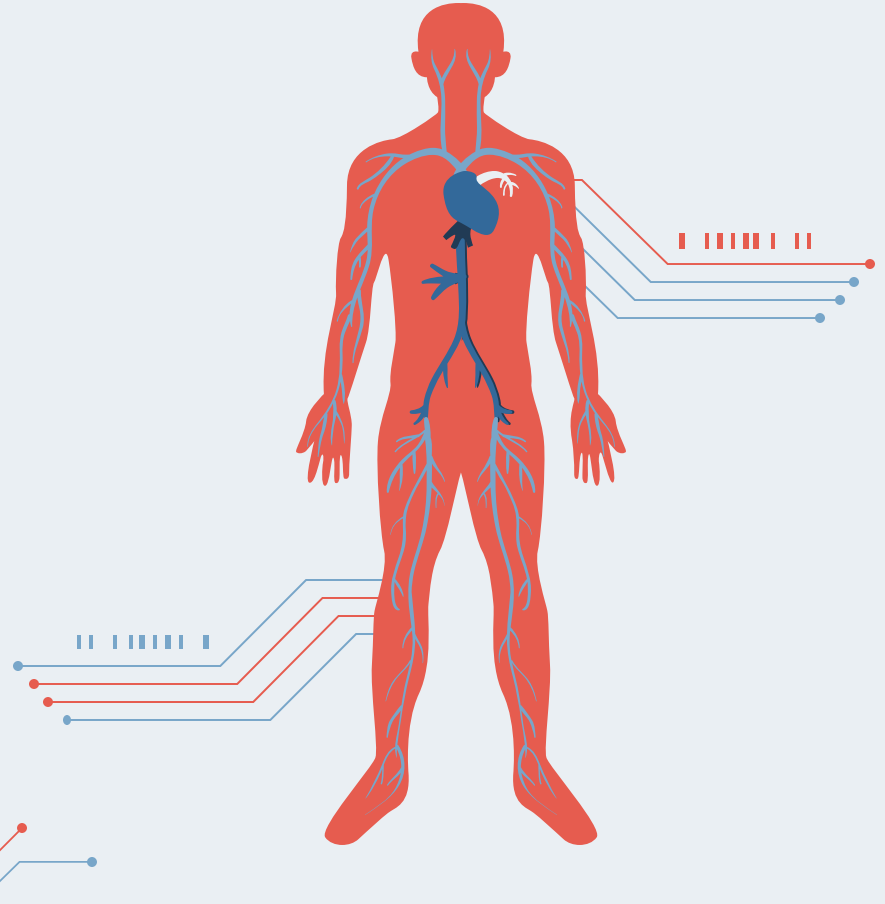
Generative Model

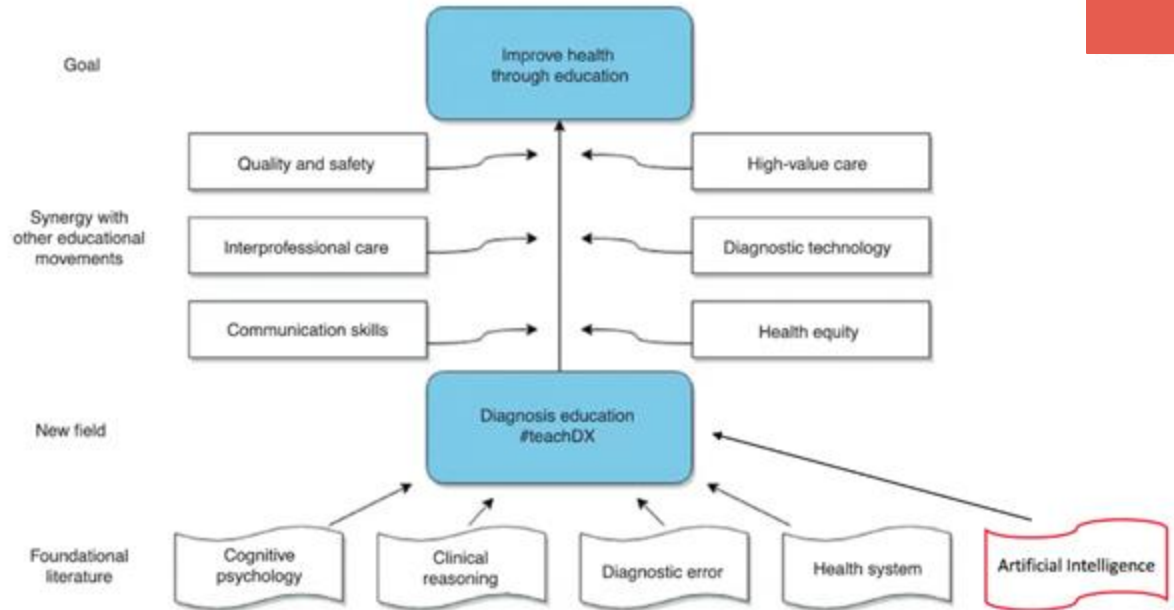




EVIDENCE & RESOURCES

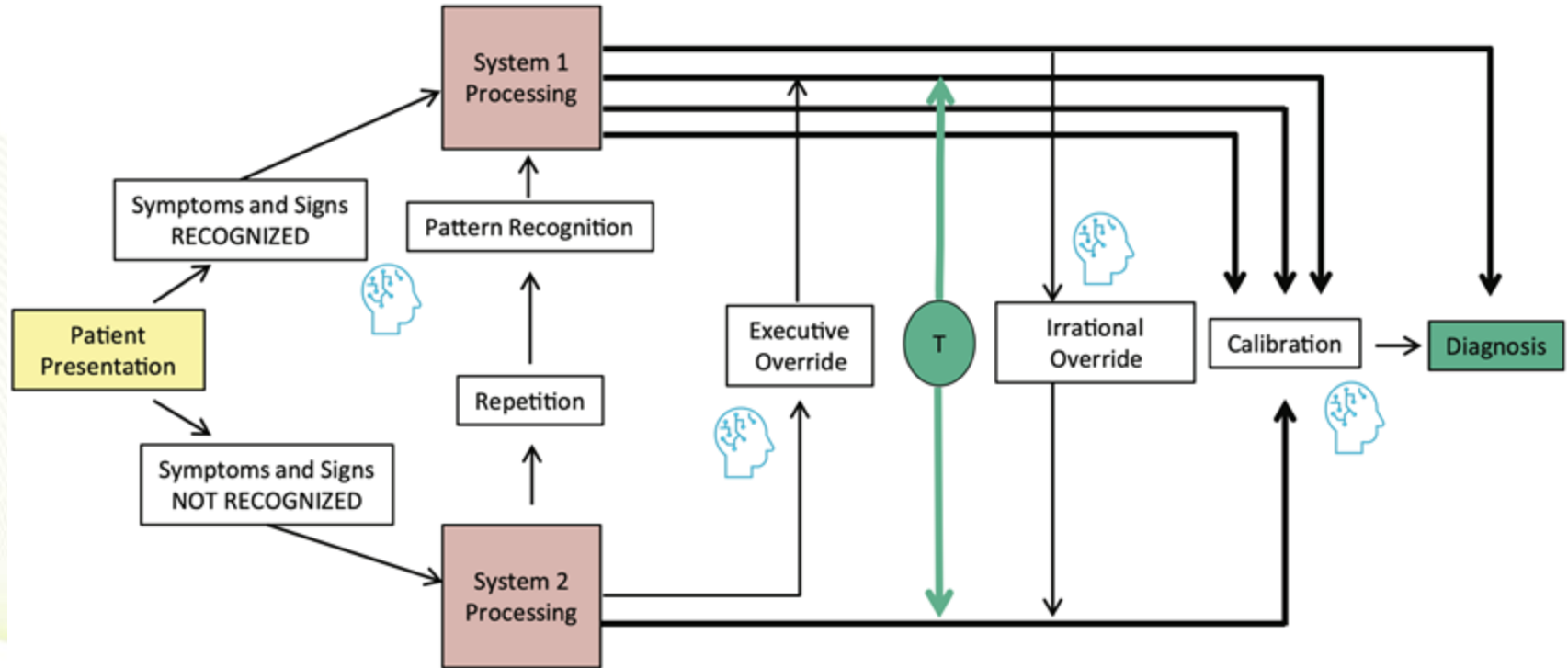
In the following slides, we recommend relevant evidence and resources related to this discussion





Olson APJ, Singhal G, Dhaliwal G. Diagnosis education - an emerging field. *Diagnosis (Berl)*. 2019;6(2):75-77.

Dual process theory of human reasoning



P. Croskerry, G. Singhal, and S. Mamede. *BMJ Quality and Safety* 22(Suppl 2):ii58–ii64. 2013

Strategically leverage AI and human strengths

AI needs

- High data frequency
- Many training examples
- Low variance in predictions
- Stable patterns
- Consistent results



So, AI is good at

- Recognizing patterns
- High throughput
- Quickly producing text, images, audio, and additional data
- Single-mindedness
- Working without fatigue

Humans (using system 2) can handle

- Sparse data representation
- High variance
- Few training examples
- Unstable pattern recognition
- Consistent results

So, humans are better at

- Contextual flexibility
- Evaluating unusual cases
- Learning on the job
- Innovation



AI relies upon **Big Data**

*but health data
contains errors and is
often contaminated
by incentive models*

Pixabay: jensenartoficial

Caution: clinical data does not always align with clinical reasoning

Relevant Readings

1. Topol, E. (2019). *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books.
2. Rajkomar, A., Dean, J., & Kohane, I. (2019). *Machine learning in medicine*. New England Journal of Medicine, 380(14), 1347-1358.
3. Miotto, R., Wang, F., Wang, S., Jiang, X., & Dudley, J. T. (2018). *Deep learning for healthcare: review, opportunities and challenges*. Briefings in Bioinformatics, 19(6), 1236–1246



THANK YOU FOR PARTICIPATING

Time for another discussion!

