Discussion 1

Developer Knowledge

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

Discussion 1

What clinical knowledge would developers need?

Remember to consider the type of model that you have

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

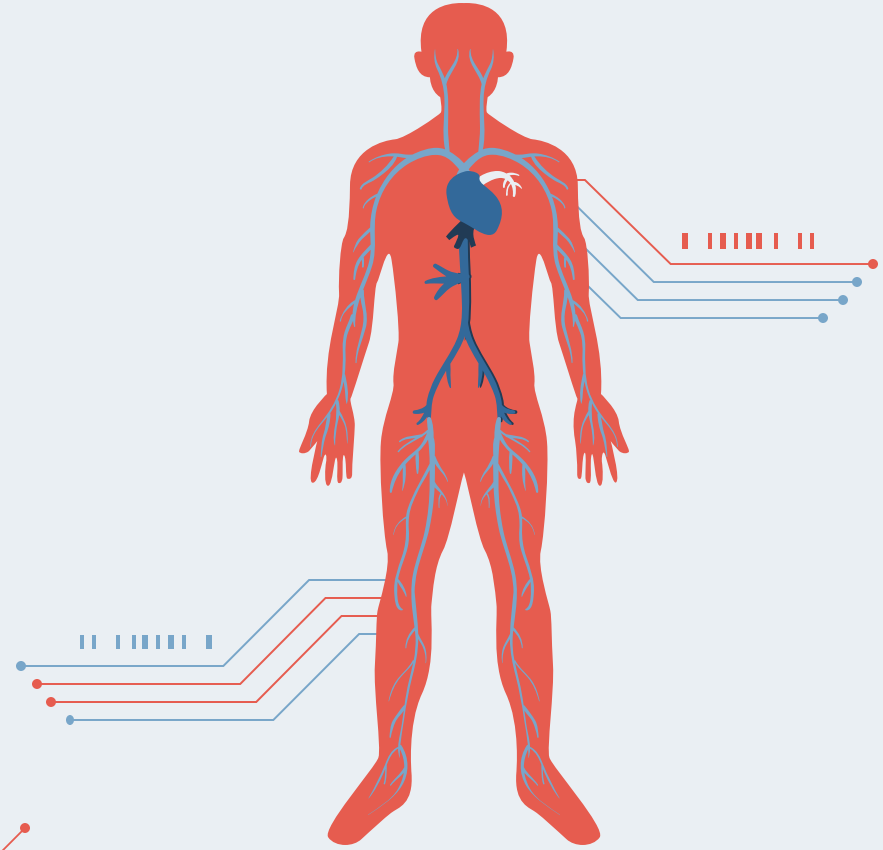
Model B
Non-generative, Image-based Model

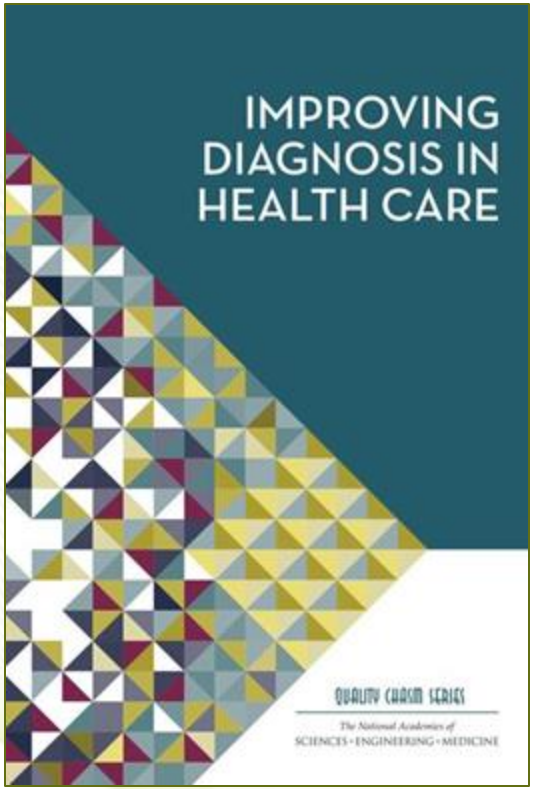
Model C
Multimodal Model

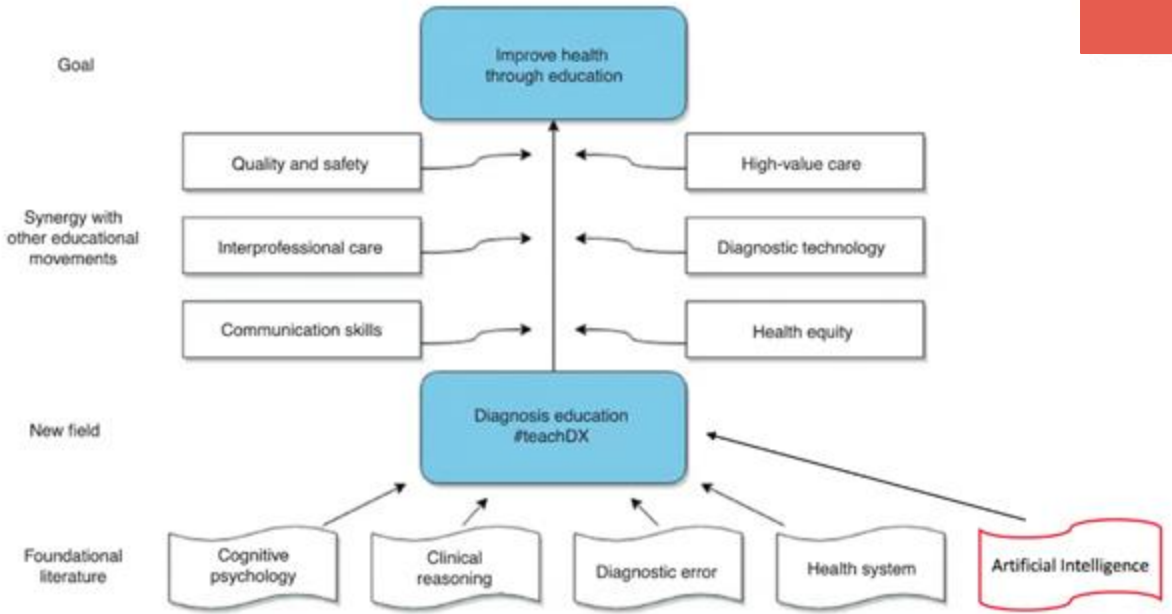
Model D
Generative Model

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.

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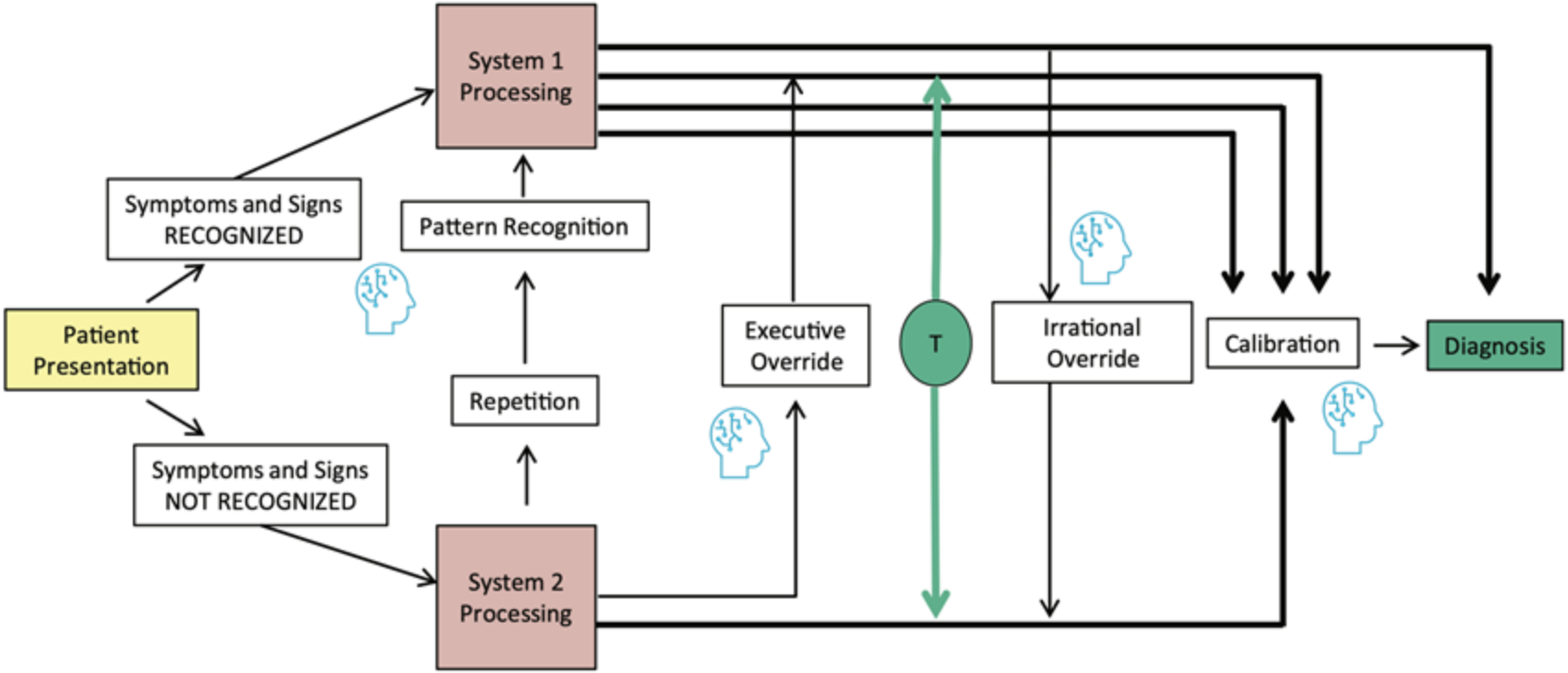
Dual process theory of human reasoning



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

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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

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AI relies upon **Big Data**

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

Caution: clinical data does not always align with clinical reasoning

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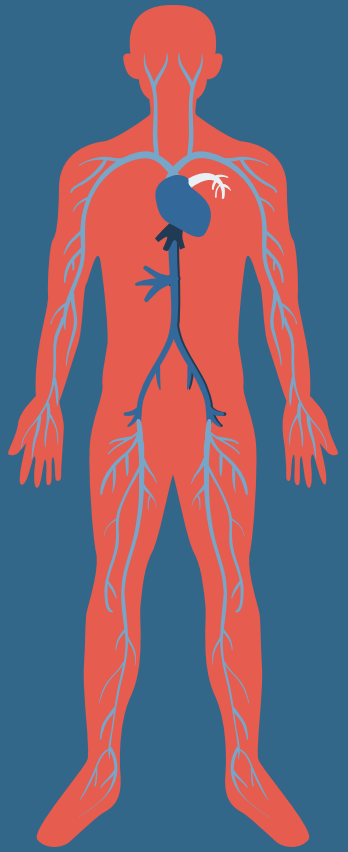
Relevant Readings

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!