



Mahidol University
Faculty of Medicine
Siriraj Hospital



AMEE
BASEL
2024

Clinical reasoning and its teaching : What is the role of artificial intelligence?

Duangjit Kanistanon

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11 OCT

13:00 - 16:00 u.

MEDUCATION
edia Production Services



AI in (emergency) medicine

- AI identify covid in CXR -> AI outperformed radiologists
- AI listens to sound : emergency call 108000 calls → 918 had cardiac arrest → start CPR + launch dispatch → sense 10% higher (84 vs 73%), also 97%spec, time to recognition shorter
 - AI → higher false positive, less false negative
 - Accuracy: Machine learning (97.2%) vs Dispatcher (98.6%)



AI and bias in medical diagnosis

Study (year 2014)

- Case liver cirrhosis with treated CA prostate (as salient distracting features)
- AI vs residents give diagnosis
- Case with no SDFs : Physicians/ChatGPT4.0/ChatGPT3.5 = 0.54/0.58/0.50
- Case with SDFs at the beginning: Physicians/ChatGPT4.0/ChatGPT3.5 = 0.39/0.25/0.33
- Case with SDFs at the end: Physicians/ChatGPT4.0/ChatGPT3.5 = 0.44/0.34/0.33



AI and bias in medical diagnosis

- ChatGPT sensitive to bias
- SDF drives wrong diagnosis by chatGPT as found in humans
“GPT is not more accurate than these junior residents”
- **Modeling language is not modeling knowledge**
 - LLM large language models predict next word in sentence based on the texts they’ve observed
- Diagnosticians use AI as a supporting diagnosis system (if the result gets along with what they think), but disregard AI if the suggested result is different (AI being off the mark)
- AI should not replace the doctor, but support the practice



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Geeky Medics platform for virtual patients

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Bundles

OSCE Stations

Quiz

Flashcards

SCA Cases

OSCE books

Login

Register

OSCE stations

Choose a station to practise your clinical skills

Interested in purchasing access for multiple students? [Contact us.](#)

Search for specialties, topics and symptoms



Examination

Procedures

History

Counselling

Interpretation

Emergency

Documentation

Anatomy

Long cases

Suggest a station

A-Z

Diagnosis

Random station

Examination

Examination

Cardiovascular examination 01

An 80-year-old has presented with palpitations, p...

Examination

Cardiovascular examination 04

A 92-year-old has presented with dyspnoea. Please...

Examination

Respiratory examination 01

A 71-year-old has presented with dyspnoea, please...



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Cardiovascular examination 01



Circuit

An 80-year-old has presented with palpitations, please perform a cardiovascular examination.

Find another station from this category 🌟

Candidate instructions 🔍

Patient instructions 👤

Examiner instructions 📄

Single player mode 📌
See all of the information in a single view ↗


Virtual patient 💬
Interact with an AI-based patient ↗

Group practice 😄 😐 😞
Prepare with others ↗

OSCE matching 🔄
Match with someone ↗

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Find an OSCE practise group ↗

Examination 📝



Cardiovascular examination 01

An 80-year-old has presented with palpitations, p...

Back

Share



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Cardiovascular examination 01 | Virtual patient

Interact using the chat interface, or press the microphone button to speak

- You are a **medical student** on placement in **general practice**
- An **80-year-old** has presented for assessment with palpitations
- Please perform a **cardiovascular examination**
- At the end of the station, you'll be asked to **present your findings**. formulate a **differential diagnosis** and then answer some **further questions**



Enter the station



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Virtual patient | Cardiovascular examination 01

Interact using the chat interface, or press the microphone button to speak

what brings you here sir

I'm feeling a bit unwell and thought it would be best to get checked out.

what symptoms you have, and for how long

I've been feeling a bit off for the past few days, but I can't pinpoint exactly what's wrong.

Upgrade to our advanced AI for more realistic consultations

Hi, how can I help you today? (Alt + T to record)



Send

You need to grant microphone access for voice input to work. Check browser settings.

600

Report issue

Patient voice

Patient instructions

06:58

[-] [||] [▶] [↺] [⊕]

Back End session

Diagnosis

Reveal diagnosis

Relevant OSCE guides

[Blurred content]





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Virtual patient | Cardiovascular examination 01

Interact using the chat interface, or press the microphone button to speak

lift your leg up against me pressing down

Sure. [The patient lifts their leg up against the pressure applied.]

another side

[This is an examination station. Describe the examination steps you would perform. You can speak to the patient when performing the examination.]

now lift your arm, one side at a time

Upgrade to our advanced AI for more realistic consultations

Hi, how can I help you today? (Alt + T to record)



Send

You need to grant microphone access for voice input to work. Check browser settings. 600

Report issue

Patient voice

Patient instructions

00:11

[-] [||] [▶] [↺] [⊕]

Back End session

Diagnosis

Reveal diagnosis


Relevant OSCE guides

[Blurred content]




Virtual patient | Cardiovascular examination 01



Interact using the chat interface, or press the microphone button to speak

another side 

[This is an examination station. Describe the examination steps you would perform. You can speak to the patient when performing the examination.]

now lift your arm, one side at a time 


Sure. [The patient lifts their arm on one side against the pressure applied.] [The patient then lifts their arm on the other side against the pressure applied.]

 Upgrade to our advanced AI for more realistic consultations 

Hi, how can I help you today? (Alt + T to record)



Send

You need to grant microphone access for voice input to work. Check browser settings.  600

Report issue

Patient voice

Patient instructions

Key details

- 80-year-old



00:01



Back

End session

Diagnosis

Reveal diagnosis

Relevant OSCE guides

Reveal guides



- None

Negative signs

- No apex beat displacement
- No palpable heaves or thrills

Auscultation

Positive signs

- Irregular heart sounds
- ▶ Pansystolic murmur best heard at the apex and radiating to the left axilla

Negative signs

- No murmurs heard in other heart valve areas

Final steps

Positive signs

- Mild pedal oedema

Negative signs

- Normal lung sounds
- No sacral oedema

Click for murmur sound



00:00

Back

End session

Relevant OSCE guides

Reveal guides



Competency in telemedicine

- AAMC (Association of American Medical Colleges) telehealth competencies: 6 domains
- Telehealth, defined as the use of technology to deliver health care at a distance,

Telehealth Competencies 4

Domain I: Patient Safety and Appropriate Use of Telehealth	4
Domain II: Access and Equity in Telehealth	5
Domain III: Communication via Telehealth	6
Domain IV: Data Collection and Assessment via Telehealth	7
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Domain VI: Ethical Practices and Legal Requirements for Telehealth	9

Table 1. Domain I: Patient Safety and Appropriate Use of Telehealth

Entering Residency (Recent Medical School Graduate)	Entering Practice (Recent Residency Graduate) <i>All Prior Competencies +</i>	Experienced Faculty Physician (3-5 Years Post-Residency) <i>All Prior Competencies +</i>
<p>1a. Explains to patients and caregivers the uses, limitations, and benefits of telehealth — that is, the use of electronic communications technology to provide care at a distance</p>	<p>1b. Explains and adapts practice in the context of the limitations and benefits of telehealth</p>	<p>1c. Role models and teaches how to practice telehealth, mitigate risks of providing care at a distance, and assess methods for improvement</p>
<p>2a. Works with diverse patients and caregivers to determine patient and caregiver access to technology to incorporate telehealth into patient care during real or simulated encounters</p>	<p>2b. Works with diverse patients and caregivers to evaluate and remedy patient and practice barriers to incorporating telehealth into patient care (e.g., access to and comfort with technology)</p>	<p>2c. Role models and teaches how to partner with diverse patients and caregivers in the use of telehealth</p>
<p>3a. Explains to patients and caregivers the roles and responsibilities of team members in telehealth encounters regardless of modality</p>	<p>3b. Demonstrates understanding of all roles and works as a team member when practicing telehealth regardless of modality</p>	<p>3c. Coordinates, implements, and evaluates the effectiveness of the telehealth team regardless of modality</p>
<p>4a. Describes when patient safety is at risk, including when and how to escalate care during a telehealth encounter (e.g., converts to in-person visit or emergency response)</p>	<p>4b. Prepares for and escalates care when patient safety is at risk during a telehealth encounter (e.g., converts to in-person visit or emergency response)</p>	<p>4c. Role models and teaches how to assess patient safety during a telehealth encounter, including preparing for and escalating care when patient safety is at risk</p>

Table 4. Domain IV: Data Collection and Assessment via Telehealth

Entering Residency (Recent Medical School Graduate)	Entering Practice (Recent Residency Graduate) <i>All Prior Competencies +</i>	Experienced Faculty Physician (3-5 Years Post-Residency) <i>All Prior Competencies +</i>
<p>1a. Obtains history (from patient, family, and/or caregiver) during a real or simulated telehealth encounter</p>	<p>1b. Obtains history (from patient, family, and/or caregiver) during a telehealth encounter and incorporates the information into differential diagnosis and the management plan</p>	<p>1c. Role models and teaches the skills required to obtain a history (from patient, family, and/or caregiver) during a telehealth encounter and incorporates the information into the management plan</p>
<p>2a. Conducts appropriate physical examination or collects relevant data on clinical status during a real or simulated telehealth encounter, including guiding the patient and/or tele-presenter</p>	<p>2b. Conducts appropriate physical examination and collects relevant data on clinical status during a telehealth encounter, including guiding the patient and/or tele-presenter</p>	<p>2c. Role models and teaches the skills required to perform a physical examination during a telehealth encounter, including guiding the patient and/or tele-presenter</p>
<p>3a. Explains the importance of patient-generated data in the clinical assessment and treatment plan during a telehealth encounter</p>	<p>3b. Incorporates patient-generated data into the clinical assessment and treatment plan while understanding data limitations and adapting accordingly</p>	<p>3c. Role models and teaches how to incorporate patient-generated data into the clinical assessment and treatment plan while understanding data limitations and adapting accordingly</p>



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Thank You.

For Your Attention

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