

# **AI Tools for Residents as Teachers**

## *Workshop Facilitator's Guide*

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## Resource Description

Generative artificial intelligence (AI) tools hold immense promise for transforming medical education by offering personalized and interactive learning experiences and synthesizing medical knowledge. For residents and fellows, who are both learners and emerging educators, these technologies provide an opportunity to enhance their teaching skills, streamline educational content creation, and adapt instruction to diverse learner needs.

This interactive workshop encourages residents and fellows to incorporate generative AI tools in their role as educators of medical students. Participants explore practical applications of AI for addressing educational needs of their students, including interactivity and personalization.

Through a mix of focused didactics, live demonstrations, small group exercises, and large group discussion, attendees gain first-hand experience using AI tools to create and refine teaching materials. The workshop also addresses ethical considerations and risks associated with AI, fostering a critical understanding of its potential role in medical education.

## Learning Objectives

- Identify educational challenges that AI tools can address in the context of medical student teaching, including time constraints, content customization, and meeting diverse learner needs.
- Develop basic proficiency using generative AI tools to develop or enhance educational materials, such as lecture slides, handouts, or review resources.
- Critically evaluate the potential benefits and risks of integrating AI tools into medical education, with a focus on ethical considerations and responsible usage.

## Intended Audience

This workshop was developed for senior psychiatry residents and fellows in a clinician educator track. It can be easily adapted for other audiences who educate medical students, including faculty.

## Prerequisites

This workshop does not require that participants have any previous knowledge or experience working with generative AI tools. Attendees are assumed to have some experience working with medical students in pre-clinical or clinical settings.

## Instructor Qualifications

Instructors should have a strong background in both clinical practice and medical student education. While deep expertise in generative AI is not required, they should possess a working familiarity with these tools and their practical applications in medical education. Additionally, instructors should be prepared to address common concerns related to AI, including issues of accuracy, bias, and ethical implications.

## Materials

- General:
  - Wi-Fi access
  - Audiovisual equipment (laptop with presentation capability, projector, speakers)
- For Presenters:
  - Free accounts with OpenEvidence, ChatGPT, Notebook LM, and/or institution-approved alternative generative AI tools
  - Workshop slide deck
- For Attendees:
  - Laptops
  - Free accounts with OpenEvidence, ChatGPT, Notebook LM, and/or institution-approved alternative generative AI tools
  - Electronic copies of personally developed educational materials (e.g. lecture slides, chalk talk notes, handouts)

## Session Outline

Time	Activity Type	Brief Description
5 min	Pre-workshop survey	Assesses baseline attitudes and experience with generative AI. Included in this educational resource.
10 minutes	Didactic	Briefly introduces fundamental mechanics of generative AI, its applications in education, and associated risks. Provides evidence that medical students are already using these tools to learn. Slides are included in this resource.
30 minutes	Live Demonstration	Presenters demonstrate potential application of 3 tools in medical education: <ul style="list-style-type: none"><li>• OpenEvidence: Retrieving and synthesizing clinical information using natural language</li><li>• ChatGPT: Role playing as tutor to help medical student better understand a research article</li><li>• NotebookLM: Generating study documents and interactive podcasts synthesized from multiple sources</li></ul>

20 minutes	Small group	Participants use AI tools to generate new educational tools from the existing educational materials they brought to session. E.g.: <ul style="list-style-type: none"> <li>• Creating lecture handouts or summaries from slides</li> <li>• Generating shelf-style questions from lecture handout</li> <li>• Creating a short AI-generated podcast from journal article they regularly give to students.</li> </ul>
10 minutes	Large group	Participants volunteer to briefly demonstrate their AI-generated educational tool with the group
20 minutes	Large Group	Participants share experiences working with AI tools. Potential discussion topics include efficiency, privacy, bias, and the ability of generative AI tools to either impede or bolster the development of critical thinking in learners.
5 minutes	Post-workshop survey	Assesses changes in knowledge and attitudes regarding generative AI as an educational tool. Included in this educational resource.

## Session Details & Recommendations

### Live Demonstration of AI Tools

Presenters should create free accounts with the AI tools below and familiarize themselves prior to presenting.

1. [OpenEvidence](#) is a generative AI chatbot designed to aggregate and synthesize peer-reviewed medical literature.
  - Suggested Demonstration
    - Begin by entering a clinical question with which you as the presenter are very familiar (e.g. “Which antidepressants are safest to use during pregnancy?”).
    - Review OpenEvidence’s output, including references and suggested follow-up questions at the bottom of the page.
    - Discuss the accuracy, strengths, and weaknesses of OpenEvidence’s response in light of your own expertise. Is there anything missing or inaccurate in the response? Do the references actually support the claims in the summary?
    - Return to the landing page and click “Explore more capabilities” to provide a brief overview of the other tasks that OpenEvidence can assist with.
    - Solicit a clinical question recently faced by one of the attendees and assess OpenEvidence’s response as a group. How does using OpenEvidence compare to other methods for accessing clinical information (e.g. medical references, PubMed)?
  - Caveats and Risks to Discuss
    - Do not enter protected health information since this tool is not Health Insurance Portability and Accountability Act (HIPAA)-compliant

- Users must assess the accuracy of OpenEvidence’s responses. This tool, like all generative AI, can generate incorrect or misleading responses.
- This tool is meant to support, not replace, clinical judgement. Per terms of service: “OpenEvidence is an experimental technology demonstrator. OpenEvidence does not provide medical advice, diagnosis or treatment.”
- Resources for Presenters to Learn More about OpenEvidence
  - [OpenEvidence as Learning Tool](#) by Mia Boltten in Icahn School of Medicine Library Guide
  - [OpenEvidence Review](#) by Velyn Wu and Jed Casauay in *Family Medicine*

2. [ChatGPT](#) is currently the most popular AI chatbot in the US and has wide-ranging applications. Here, we demonstrate its ability to role play as a tutor to help a medical student better understand a research article.

- Suggested Demonstration:
  - Provide a very brief overview of a clinical research article to the audience before uploading it to ChatGPT.
  - Ask ChatGPT to role play as a tutor with a prompt such as “I’m a medical student preparing for a journal club. Can you please help me answer some questions about the attached research article?”
  - Point out to the attendees that asking ChatGPT to role play is a helpful way to provide context about how you would like it to respond. Emphasize that the output from generative AI models is very sensitive to inputs provided by the user.
  - Demonstrate how ChatGPT can help a student better understand the article using prompts such as:
    - “Please provide me with a high-level summary of this article in simple terms.”
    - “Define [unfamiliar concept] and give me the relevant background.”
    - “Can you explain the study design and statistical methods used in this article?”
  - Illustrate how ChatGPT can also stimulate more critical analysis of the article with prompts such as:
    - “What are limitations of this study that the authors did not mention in the paper?”
    - “What alternative study designs could have been used to investigate the research questions?”
    - “How could the findings be misinterpreted or misused in clinical practice or medical decision making?”
    - “How does this study compare to previous research on this topic? Are there conflicting findings in the literature?”
  - Highlight the importance of iteration when working with ChatGPT. Refining prompts, providing feedback, and engaging in back-and-forth dialogue leads to richer interactions with ChatGPT.

- Caveats and Risks to Discuss
    - ChatGPT may be more prone to hallucinations than OpenEvidence for a variety of reasons. You can demonstrate this by disagreeing with ChatGPT's response, which occasionally leads it to contradict its original response, even if it was accurate.
    - Do not enter protected health information since this tool is not HIPAA-compliant.
3. [NotebookLM](#) is a generative AI tool created by Google that allows users to synthesize multiple sources of information, including documents, websites, slideshows, and videos. Here, we simulate a preclinical medical student using NotebookLM to learn about renal physiology.
- Suggested Demonstration
    - Before the workshop, create a new notebook and upload multiple sources about renal physiology including electronic textbook chapters, outlines, presentation slides, and links to YouTube videos.
    - During the workshop, demonstrate how the chat functionality can be used to interact with the source materials in natural language.
    - Highlight unique Studio features of NotebookLM, including generating summaries ("briefing docs"), study guides, and frequently asked questions (FAQ) documents.
    - Showcase Audio Overviews, which create a podcast-style conversation between two AI hosts about the source material. Using the Interactive Mode, users can ask questions directly to the AI hosts for a back-and-forth conversation.
  - Caveats and Risks to Discuss
    - NotebookLM will reflect biases contained in the uploaded sources.
    - Do not enter protected health information since this tool is not HIPAA-compliant.

## Suggested Prompts for Group Discussion

- Do you see yourself incorporating AI tools into your teaching for medical students? Why or why not?
- What concerns you most about using AI tools in medical education?
- How could AI tools support or hinder the development of critical thinking in our learners?
- What are some potential risks of over-reliance on AI for learning and decision-making?
- How do you think AI-generated content should be reviewed or validated before use in teaching?
- How can we identify and mitigate the risk of bias that AI tools could amplify? In what areas of medical education do you see the biggest risk of bias?
- What are some ways AI can support inclusivity and accessibility in medical education?
- What skills do you anticipate medical students will need develop to work effectively with AI in clinical settings?
- How do you think AI will change the role of educators in the future?

## References

Bolton, M. Icahn School of Medicine at Mount Sinai Levy Library Guides: Artificial Intelligence (AI) in Learning and Discovery: AI in Teaching and Learning Blog. Published May 22, 2024. <https://libguides.mssm.edu/ai/blog/OpenEvidence-as-Learning->

Tool#:~:text=OpenEvidence%20is%20an%20AI%2Dpowered%20platform%20that%20aggregates%2C,in%20learning%20and%20making%20evidence%2Dbased%20decisions%20(1).

Wu, V., & Casauay, J. (2024). OpenEvidence. *Family Medicine*, 56, 1–2. <https://doi.org/10.22454/FAMMED.2024.587513>

## Pre-Workshop Survey

1. Have you used AI tools (e.g., ChatGPT, NotebookLM) in any capacity before?

☐ Yes

☐ No

2. If yes, please describe your experience briefly:

3. Have you used AI tools in a **teaching** capacity before?

☐ Yes

☐ No

4. If yes, please describe your experience briefly:

5. On a scale of 1–5, how confident are you in your ability to use AI tools in medical education?

1	2	3	4	5
(not confident at all)		(neutral)		(very confident)

6. How likely are you to incorporate AI tools into your teaching in the next 3 months?

1	2	3	4	5
(not likely at all)				(very likely)



## Post-Workshop Survey

1. Did the workshop improve your understanding of AI's potential role in education?

☐ Yes

☐ No

2. On a scale of 1–5, how confident are you in your ability to use AI tools in medical education after attending the workshop?

1  
(not confident at all)

2

3  
(neutral)

4

5  
(very confident)

3. How likely are you to incorporate AI tools into your teaching in the next 3 months?

1  
(not likely at all)

2

3

4

5  
(very likely)

4. Please share any specific examples of how you might use AI tools in your teaching going forward. (free response)

5. Please rate the overall quality of this session

1  
(poor)

2

3

4

5  
(excellent )

6. What was the most useful part of the workshop? (free response)

7. What could be improved about the workshop? (free response)

8. What AI-related topics would you like to see addressed as part of your residency/fellowship education? (free response)