

MONTHLY ON MONDAYS: AI IN MEDICAL EDUCATION

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MED UCI SCHOOL OF MEDICINE**

SEPTEMBER 8, 2025



OBJECTIVES

- RECOGNIZE ROLE OF AI IN MEDICAL EDUCATION
- IDENTIFY ONE AI TOOL FOR CLINICAL USE AND PATIENT CARE
- DEFINE AI HALLUCINATIONS AND EXPLAIN HOW BIAS IN DATA CAN AFFECT AI RESPONSES



THE ROLE OF AI IN MEDICAL EDUCATION

```
mirror_mod.mirror_object =  
operation == "MIRROR_X":  
mirror_mod.use_x = True  
mirror_mod.use_y = False  
mirror_mod.use_z = False  
operation == "MIRROR_Y":  
mirror_mod.use_x = False  
mirror_mod.use_y = True  
mirror_mod.use_z = False  
operation == "MIRROR_Z":  
mirror_mod.use_x = False  
mirror_mod.use_y = False  
mirror_mod.use_z = True
```

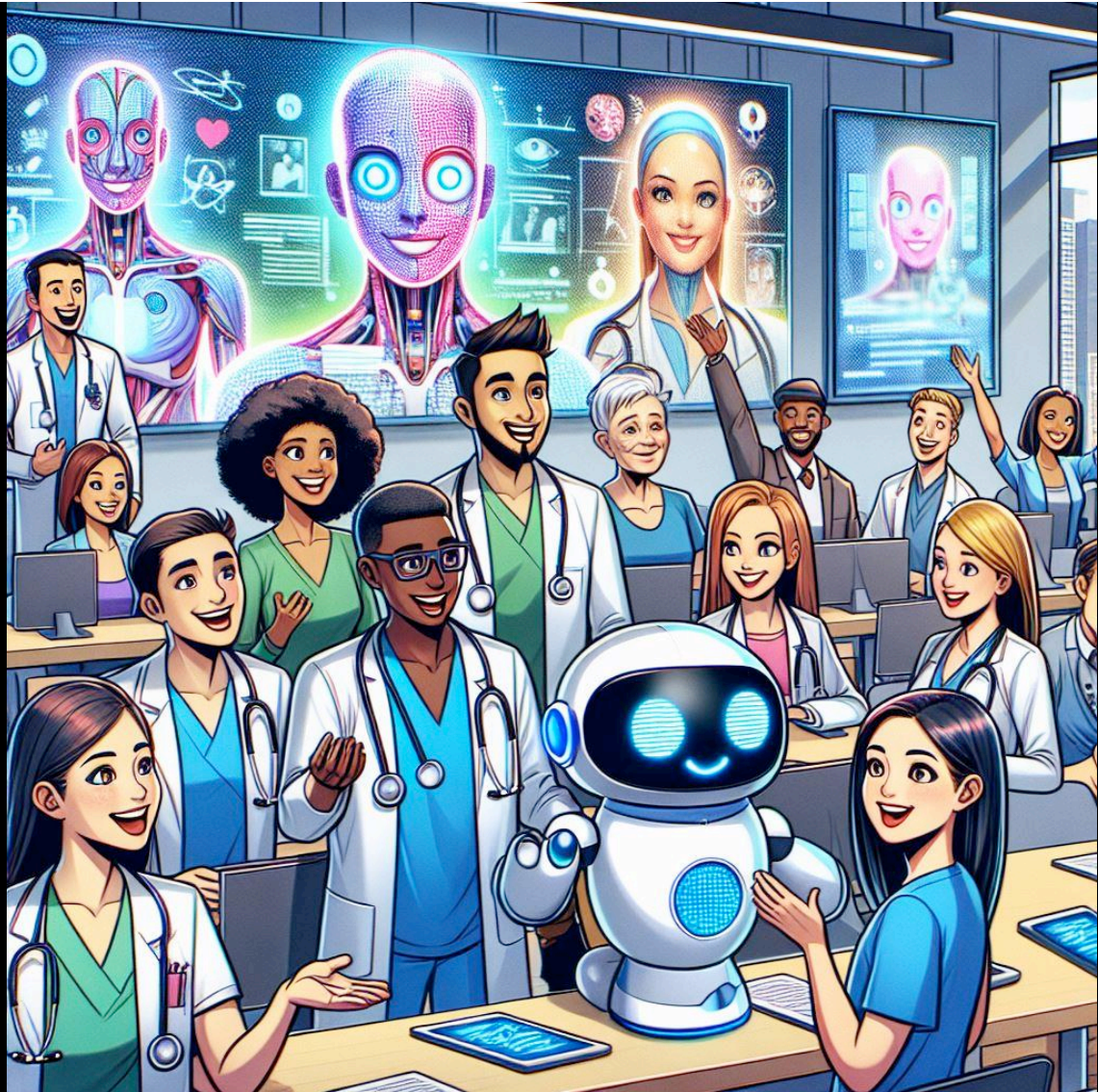
```
#selection at the end -add  
mirror_ob.select= 1  
mirror_ob.select=1  
context.scene.objects.active  
("Selected" + str(modifier_ob))  
mirror_ob.select = 0  
= bpy.context.selected_object  
data.objects[one.name].select  
print("please select exactly
```

--- OPERATOR CLASSES ---

```
types.Operator):  
on X mirror to the selected  
object.mirror_mirror_x"  
mirror X"
```

```
text):  
object is not
```

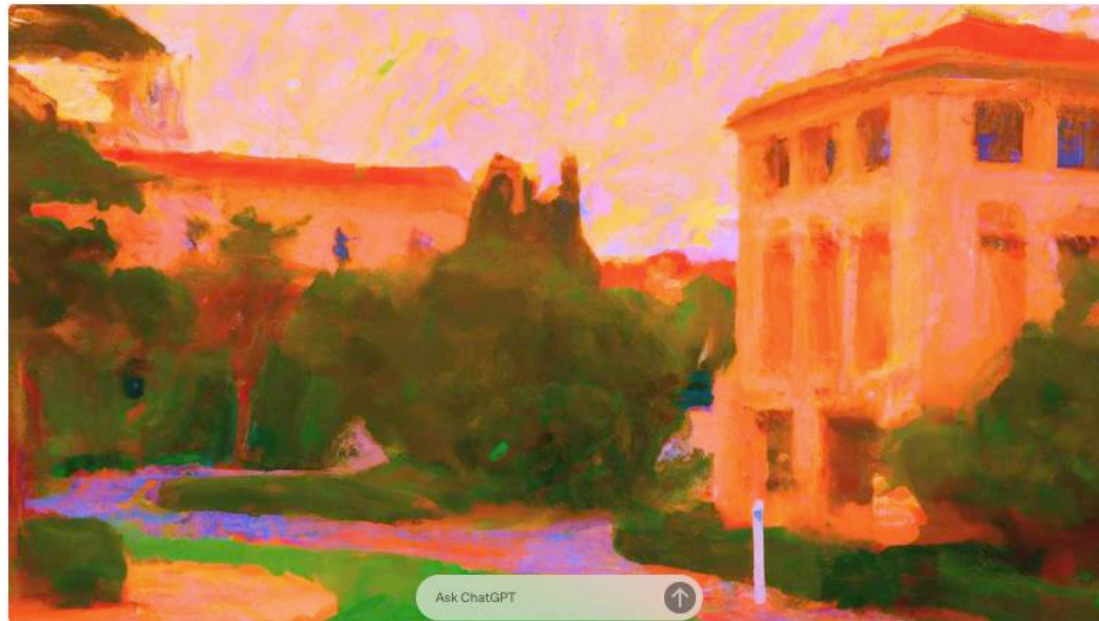
Draw a comic of a medical educator embracing AI.
(Source: Microsoft Copilot)



February 4, 2025 Company

OpenAI and the California State University system bring AI to 500,000 students and faculty

The largest deployment of ChatGPT to date will expand the use of AI in education and help the United States build an AI-ready workforce.

[Research](#)[Safety](#)[ChatGPT](#)[Sora](#)[API Platform](#)[For Business](#)[Stories](#)[Company](#)[News](#)

Ask ChatGPT



2025 EDUCAUSE STUDENTS AND TECHNOLOGY REPORT: WORKFORCE PREPARATION

Top Three Competency Areas Most Important for Career
Percentage of Respondents (N=5,725)

55%

**Generative AI for
Careers**

Students do not recognize the importance of generative AI for their careers

20%

Generative AI Training

Students report receiving limited relevant training from their institutions

3%

**Proficiency with AI
Tools**

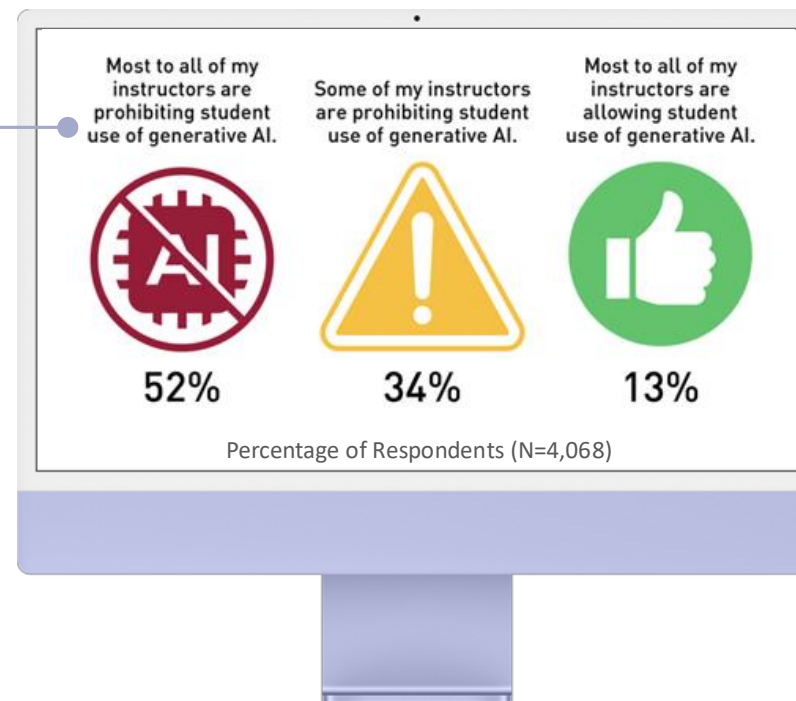
Students do not find AI tools as a competency area expected to be important for career



2025 EDUCAUSE STUDENTS AND TECHNOLOGY REPORT: GENERATIVE AI IN THE CLASSROOM

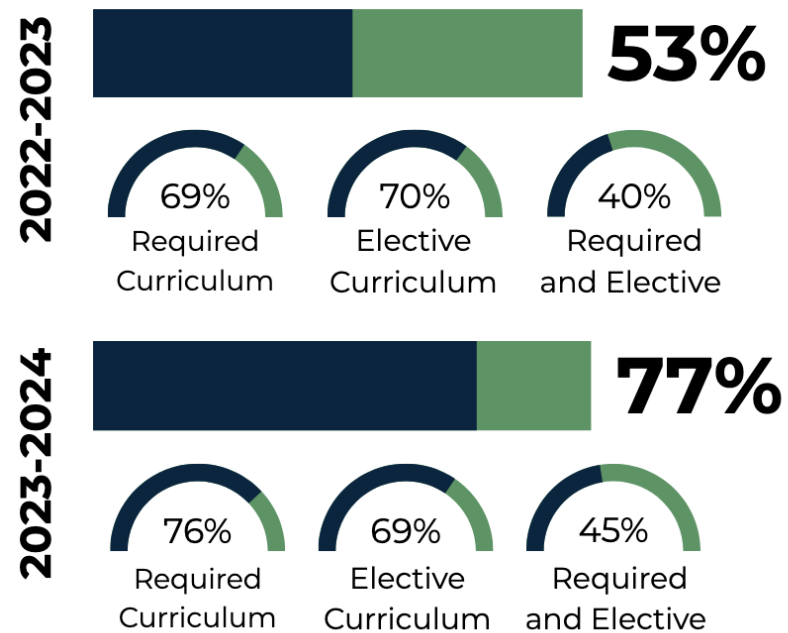
Limited use of Generative AI in Instruction

Possibly reporting due
to student fears about
academic misconduct



AAMC DATA SNAPSHOT: ARTIFICIAL INTELLIGENCE CURRICULA IN U.S. AND CANADIAN MEDICAL SCHOOLS (JUNE 2025)

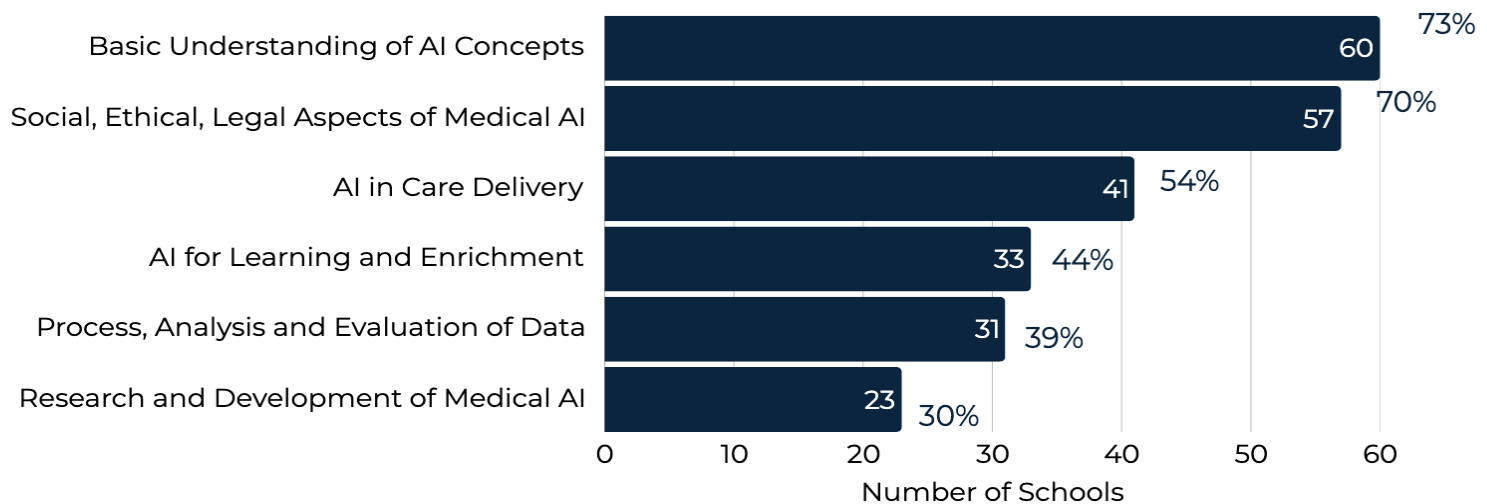
Figure 1. Number of schools with AI in the curriculum.



AAMC DATA SNAPSHOT: ARTIFICIAL INTELLIGENCE CURRICULA IN U.S. AND CANADIAN MEDICAL SCHOOLS (JUNE 2025)

Figure 2. AI topics in required curriculum.

Percentages were calculated based on total medical school respondents to each AI topic on the survey, whether medical schools responded "Yes" or "No" regarding an AI topic in the required curriculum.



AAMC DATA SNAPSHOT: ARTIFICIAL INTELLIGENCE CURRICULA IN U.S. AND CANADIAN MEDICAL SCHOOLS (JUNE 2025)

Figure 3. Number of schools with infrastructure to support AI integration.

Students Provided With Secure Access to AI Agent



Schools that Have an Appropriate Use Policy



DRAFT

MedBiquitous[®]
THE STANDARDS PROGRAM OF THE AAMC

The International Advisory Committee on Artificial Intelligence (IACAI) - *DRAFT*

The International Advisory Committee on Artificial Intelligence (IACAI) was convened in early 2024 in collaboration with the Association of American Medical Colleges (AAMC), the International Association of Medical Science Educators (IAMSE), AMEE: the International Association for Health Professions Education, and the National University of Singapore (NUS). Members were selected to represent a global medical education perspective on AI to ensure the range of innovations and learning can be harnessed for everyone's benefit. This inaugural committee, composed of experts in medical education, AI technology, and healthcare, began developing a comprehensive vision for the future of AI in medical education. The IACAI was convened to provide insights and recommendations on advancing and leveraging AI in medical education, and has representation from across the globe.



IACAI Goal: Develop a vision of the future for AI in medical education and identify how to proactively achieve this future, including providing guidance and resources for effective and ethical implementation.

Matrix I: Recommendations for Integrating AI - Educator Focus

Domains & Vision Statements	INTRA-PERSONAL <i>Recommendations for an Educator on the personal, preparatory or conceptual level</i>	MICRO <i>Recommendations for a Medical Educator in practice</i>	MESO <i>Recommendations for an individual Medical School</i>	MACRO <i>Recommendations for individual Medical Education Organizations (AMEE, IAMSE, AAMC, NBME)</i>	MEGA <i>Recommendations for an International Medical AI Consortium (IACAI and similar)</i>
I. AI Values, Culture & Integration Plan <i>Through intentional planning, AI is thoughtfully integrated into the curriculum, aligning with the institution's mission, while considering the diverse perspectives and needs of faculty. Medical schools stay current with AI applications to healthcare.</i>	1. Explore one's own values & perceptions regarding AI in medical education. 2. Develop self-awareness about one's own knowledge, skills & attitudes towards AI 3. Compare & contrast these thoughts and feelings with others. 4. Explore the evolving role of AI in UME & healthcare. 5. Explore future potential developments in AI such as AGI & superintelligence. 6. Explain AI as a foundational technology with transformative potential for society.	1. Identify or co-develop the medical school's values & mission regarding AI adaptation or integration. 2. Convene as an educator community of practice, share experiences of using digital or AI technologies in UME contexts. 3. Offer training resources for educators teaching a given course, such as a course-specific set of principles for using AI. 4. Share experience, lessons learnt, good practice and a case study with other educators on other courses within the institution.	1. Establish an institutional-level working group or equivalent, that ensures alignment of the organizational values around education & digital technology with the use of AI across all educational courses & programs. 2. Ensure institutional policies, procedures, & processes are regularly updated to support the adoption of AI & seamlessly integrate the technology into routine operations. 3. Organize cross-institutional activities and sharing of practice that brings together stakeholders such as AI & technology experts. 4. Foster a culture of continual learning around latest AI developments.	1. Facilitate the creation of shared AI vision based on common values across various communities, cultures & countries. 2. Bring together people across borders to participate in cross-institutional forums for sharing ideas around strategic planning for AI integration into healthcare & UME. 3. Engage in future-casting to anticipate & shape the long-term impact of AI in healthcare & UME. 4. Create & openly share resources across organisations.	1. Set the direction & spark the conversation on the important, essential, & relevant AI values while articulating a clear vision for AI within the contexts of healthcare & UME. 2. Organize a formal consortium to identify key priorities and common goals with respect to the use and integration of AI in healthcare and UME. 3. Embed principles of equity, diversity & inclusion into all policy, procedure & practice when bringing together stakeholders.



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Responsible Use of AI in and for Medical Education

[Key Principles](#)[Appendix](#)[Review Committee](#)

Principles for the Responsible Use of Artificial Intelligence in and for Medical Education

Artificial intelligence (AI) refers to a broad range of advanced techniques and processes that perform complex tasks, such as large language models, machine learning, and natural language processing. As [the existing literature](#) indicates, AI holds great promise for medicine, and there is an urgent call to action to integrate and use AI in education and training. Doing so will enable the future workforce to leverage AI in practice and will equip them with the skills to adapt to emerging technologies in the service of high-quality patient care.

PRINCIPLES FOR THE RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE IN AND FOR MEDICAL EDUCATION

1. Maintain Human-Centered Focus
2. Ensure Ethical and Transparent Use
3. Provide Equitable Access to AI
4. Foster Education, Training, and Continuing Professional Development
5. Develop Curricula Through Interdisciplinary Collaboration
6. Protect Data Privacy
7. Monitor and Evaluate

(Source: AAMC)



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SCHOLARLY PERSPECTIVE

Integrating Generative Artificial Intelligence Into Medical Education: Curriculum, Policy, and Governance Strategies

Triola, Marc M. MD¹; Rodman, Adam MD, MPH²

[Author Information](#) ☺

Academic Medicine ();10.1097/ACM.0000000000005963, December 20, 2024. | DOI: 10.1097/ACM.0000000000005963

INTEGRATING GENERATIVE ARTIFICIAL INTELLIGENCE INTO MEDICAL EDUCATION

Recommendations:

1. **Policy:** Create policies for appropriate GAI use
2. **Governance:** Create governance for GAI use
3. **Curriculum:** Define learner competencies and develop an engaging curriculum to teach responsible use of GAI

(Source: Triola MM, Rodman A. Integrating Generative Artificial Intelligence Into Medical Education: Curriculum, Policy, and Governance Strategies. Acad Med. Published online December 20, 2024.)



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SCHOLARLY PERSPECTIVE

Entrustment and EPAs for Artificial Intelligence (AI): A Framework to Safeguard the Use of AI in Health Professions Education

Gin, Brian C. MD, PhD; O'Sullivan, Patricia S. EdD; Hauer, Karen E. MD, PhD; Abdulnour, Raja-Elie MD; Mackenzie, Madelynn; ten Cate, Olle PhD; Boscardin, Christy K. PhD

[Author Information](#) ✓

Academic Medicine ():10.1097/ACM.0000000000005930, November 14, 2024. | DOI: 10.1097/ACM.0000000000005930

TRUSTWORTHINESS OF AI TO PERFORM AN HPE-RELATED TASK

TRUSTWORTHINESS CHARACTERISTIC	AS APPLIED TO HPE TRAINEES	AS APPLIED TO AI TOOLS
Ability	Does the trainee demonstrate the competence (knowledge, skills, and attitudes) to perform the task reliably and consistently? Does the trainee demonstrate conscientiousness and responsibility toward their work?	Is the AI transparent about how it generates its output? Does the AI faithfully represent its source data, and is it able to cite this source data? Is the AI able to provide insight into its “thought processes” and estimate its level of certainty? Are the AI’s biases disclosed and addressed?

(Source: Gin BC, O'Sullivan PS, Hauer KE, et al. Entrustment and EPAs for Artificial Intelligence (AI): A Framework to Safeguard the Use of AI in Health Professions Education. Acad Med. Published online November 14, 2024.)



Foundational Competencies for Undergraduate Medical Education



FOUNDATIONAL COMPETENCIES FOR UNDERGRADUATE MEDICAL EDUCATION

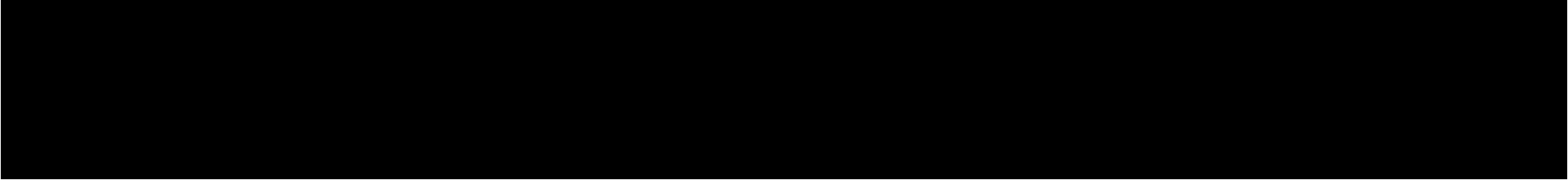
1. Professionalism
2. Patient Care and Procedural Skills
3. Medical Knowledge
4. Practice-Based Learning and Improvement
5. Interpersonal and Communication Skills
6. Systems-Based Practice

(Source: AAMC, AACOM, ACGME. Foundational Competencies for Undergraduate Medical Education. AAMC, AACOM, ACGME; 2024.)

Systems-Based Practice

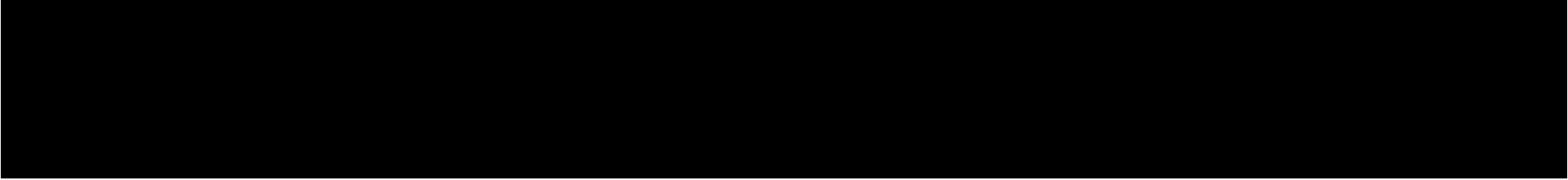
Applies knowledge of the larger context of health, including its social and structural determinants, and of systems and resources within and outside of health care, to optimize high-quality care for patients, communities, and populations.

1. Applies knowledge of social and structural drivers of health.
2. Recognizes mechanisms to reduce disparities and advance health equity in patient care and health care systems.
3. Adapts performance to various health care teams, delivery settings, and systems.
4. Collaborates in transitions and coordination of patient care.
5. Evaluates the risks and benefits of using current and emerging technologies in patient care.
6. Identifies patient safety concerns, systems issues, and opportunities for quality improvement.
7. Describes health policy and the financial context of health care.
8. Applies knowledge of local population and community health needs, disparities, and resources.



Practice-Based Learning and Improvement

Integrates feedback, evidence, and reflection to adapt behavior, foster improvement, and cultivate lifelong learning.

1. Actively seeks and incorporates feedback and assessment data to improve performance.
 2. Identifies opportunities for growth in one's own performance through informed self-assessment and reflective practice.
 3. Develops, implements, and reassesses learning and improvement goals.
 4. Locates, critically appraises, and synthesizes information to support evidence-informed, patient-centered clinical decisions.
 5. Demonstrates inquiry and ability to grow and seek new knowledge.
- 

Professionalism

Demonstrates integrity, respect, and ethical reasoning, and promotes inclusion of differences in all interactions to improve health care for patients, communities, and populations.

1. Demonstrates respect and compassion for patients, caregivers, families, and team members.
2. Safeguards patient privacy, confidentiality, and autonomy.
3. Uses ethical principles and reasoning to guide behavior.
4. Adapts actions and communication according to the situation.
5. Takes ownership of mistakes and acts to address them.
6. Identifies personal limits of knowledge and skills and seeks help appropriately.
7. Identifies personal biases and strategies to mitigate their effects.
8. Demonstrates humility and a willingness to learn from others with different backgrounds and experiences.
9. Recognizes and addresses personal well-being needs that may impact professional performance.
10. Completes duties and tasks in a thorough, reliable, and timely manner.
11. DO-specific: Demonstrates the philosophy of osteopathic medicine by promoting its four tenets.

You: Which of the foundational competencies could have an AI competency component for medical students?

AI: Based on the information provided in the document excerpts, several foundational competencies could potentially have an AI competency component for medical students:

1. **Medical Knowledge:** AI could be integrated into how medical students learn and apply foundational knowledge to improve healthcare for patients and populations.
2. **Practice-Based Learning and Improvement:** AI tools could be incorporated into how students integrate feedback, evidence, and reflection to adapt their behavior and improve patient care.
3. **Systems-Based Practice:** Understanding and utilizing AI systems within healthcare could become a part of how students learn to navigate and improve health systems.
4. **Patient Care and Procedural Skills:** AI could be incorporated into how students learn to provide evidence-informed and patient-centered care.
5. **Interpersonal and Communication Skills:** While not explicitly mentioned, AI could potentially be used in developing communication skills or understanding how to communicate about AI-assisted diagnoses or treatments.

It's important to note that while the document mentions the use of AI in analyzing feedback during the development of these competencies, it does not explicitly state that AI should be a component of the competencies themselves. However, **given the increasing role of AI in healthcare, it would be reasonable to consider incorporating AI-related skills and knowledge into these foundational competencies for medical students.**

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Artificial Intelligence and Academic Medicine

AI FOR **MEDICAL
EDUCATION**

Incorporating AI into the work you do

**LEARNING &
NETWORKING**

**CRITICAL
RESOURCES**

**COMMUNITY
COLLABORATIONS**

Teaching AI best practices to learners,
faculty, and staff

AI IN **MEDICAL
EDUCATION**



EXAMPLES

PRACTICAL AI TOOLS



<https://zotgpt.uci.edu/>

UCI ZotGPT



<https://zotgpt.uci.edu/>

ZotGPT Services By UCI, For UCI



ZotGPT
Chat

ZotGPT Chat is a free AI tool for UCI students, faculty, and staff, offering features like multiple models, chat history, file uploads, and a large context window. For class-related use, follow your instructor's guidelines. Built with Microsoft Azure AI, Amazon AWS, and open web technologies, it operates securely within UCI's infrastructure.

[Launch ZotGPT Chat](#)

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ZotGPT
Creator

Build custom AI chatbots tailored to administrative tasks, research projects, and specialized workflows. It supports document uploads, website scraping, and configurable AI models to deliver personalized, data-driven assistance. Available for staff and instructors.

[Launch Creator](#)

[More Info](#)

Create Chatbot – Step 1

1. Name, Prompt, and Access

2. AI Configuration

3. Knowledge Management

Name

SOM Policies and Bylaws

Up to 100 characters

Short Description

This chatbot will users navigate the key policies, procedures and bylaws of the School of Medicine.

System Prompt

You are a member of the UCI School of Medicine community and need to understand the key policies, procedures and bylaws that govern the learning environment and medical education. The data shared here contains the following: Student Handbook from August 2025, CEP Policies and Procedures approved 12/14/2023, Curriculum Review Policy approved 9/25/2024, School of Medicine Bylaws approved March 2025.

Up to 10,000 characters

Contact Info

Name: Julie H Youm

Email: jyoum@uci.edu

Access Controls

- ☐ **Open to public:** Public chatbots require approval, contact oit-ai@uci.edu to inquire.
- ☒ **UCI:** Anybody at UCI you share the link with
- ☐ **Invite only:** Specify members who can access

NEXT: CONFIGURE AI

CANCEL

Create Chatbot – Step 2

1. Name, Prompt, and Access

2. AI Configuration

3. Knowledge Management

Model

- ☐ GPT-5
- ☐ Anthropic Claude Opus 4.1
- ☐ Anthropic Claude Opus 4
- ☐ Anthropic Claude Sonnet 4
- ☐ Google Gemini 2.5 Pro
- ☐ DeepSeek R1
- ☒ GPT-4.1 RECOMMENDED
- ☐ Anthropic Claude Sonnet 3.7
- ☐ OpenAI o3 (o3)
- ☐ OpenAI o1 (o1)
- ☐ GPT-4 Omni (GPT-4o)
- ☐ Anthropic Claude Sonnet 3.5 v2
- ☐ Anthropic Claude Sonnet 3.5
- ☐ Google Gemini 2.5 Flash
- ☐ Google Gemini 2.5 Flash-Lite
- ☐ OpenAI o4 Mini (o4-mini)
- ☐ OpenAI o3 Mini (o3-mini)
- ☐ OpenAI o1 Mini (o1-mini)
- ☐ GPT-5 Mini
- ☐ GPT-4.1 Mini
- ☐ GPT-4 Omni Mini (GPT-4o mini)
- ☐ GPT-5 Nano
- ☐ GPT-4.1 Nano
- ☐ Anthropic Claude Haiku 3.5
- ☐ Mistral Large 2 (24.07)
- ☐ GPT-4 Turbo
- ☐ GPT-3.5 Turbo
- ☐ Mixtral 8x7B Instruct

Conversation Style

- ☐ Balanced
- ☒ Precise RECOMMENDED
- ☐ Creative
- ☐ Custom COMING SOON

NEXT: MANAGE KNOWLEDGE

BACK

CANCEL

Create Chatbot – Step 3

1. Name, Prompt, and Access 2. AI Configuration **3. Knowledge Management**

Web Content

- ZotGPT Creator can crawl **up to three websites** for content.
- Web content is updated approximately weekly
- Only web content on public *.edu, *.gov, and *.org domain websites can be included

Add Website

Uploaded Files

- Upload files to include in your chatbot's knowledge base.
- ZotGPT Creator can process files up to **200.00 MB** in size.
- Supported file types: **PDF, Word, Excel, PowerPoint, Text, HTML/XML, JPEG, PNG, BMP, HEIF, TIFF**
- Processing time is estimated to be about 10 seconds per page on average depending on the dataset and processing queue availability.

Select files to upload as knowledge



Files to upload

Processing Type

Tip For Processing Type, try Vision for images and Text Extraction for text based files.

bylaws_som-25-03-18.pdf (204.95 KB)



Add an optional file description to aid in processing



Text Extraction



StudentHandbook-AY2526.CompiledAug2025.pdf (42.38 MB)



Add an optional file description to aid in processing



Text Extraction



8.1 CEP Policy and Procedures.pdf (99.03 KB)



Add an optional file description to aid in processing



Text Extraction



8.3 Curriculum Review Policy.pdf (431.18 KB)



Add an optional file description to aid in processing



Text Extraction



Upload Files

CREATE CHATBOT

BACK

CANCEL

Which policy contains information about medical student supervision?

9/6/2025 11:22 pm

🔊 📄 🗑️

 You

 Bot

The policy containing information about medical student supervision is typically found in the **Student Handbook** as well as in the **CEP (Curriculum and Educational Policy) Policies and Procedures**. At UC Irvine School of Medicine, these documents detail the requirements and standards for medical student supervision, including who may supervise students and the scope of supervision in clinical and educational settings.

If you need the exact section or a summary from one of these documents, please let me know!

9/6/2025 11:22 pm

🔊 📄 🗑️

Please share the exact sections.

9/6/2025 11:22 pm

🔊 📄 🗑️

 You

 Bot

Certainly! Based on the available policy documents for the UCI School of Medicine:

Medical student supervision is addressed in the following sections:

1. Student Handbook (August 2025)

- **Section: Student Supervision Policy**

- This section outlines the requirement that medical students must be appropriately supervised at all times during clinical activities. It specifies who is authorized to supervise (attending physicians, residents, and certain allied health professionals) and describes levels of supervision depending on the student's year and competency.

2. CEP Policies and Procedures (Approved 12/14/2023)

- **Section: Supervision of Medical Students in Clinical Settings**

- This policy section details expectations for supervision during clerkships, acting internships, and other patient care activities. It also covers documentation, direct observation, and protocols for escalating concerns about supervision.

If you need the full text of these sections or further details, let me know!

9/6/2025 11:22 pm

🔊 📄 🗑️



What is a good place to start clinically with AI tools?

OpenEvidence[®]

Ask a medical question...



Select Patient



Deep Consult



Write a Patient Handout



Ask about Treatment Alternatives



Ask a Pop-Science Question

Explore More Capabilities



OpenEvidence is the leading medical information platform.



Launched from the Mayo Clinic Platform
Accelerate program



Featuring multimedia and clinical findings
from The New England Journal of
Medicine



Featuring multimedia and clinical findings
from JAMA and the JAMA Network
specialty journals

Our mission is to organize and expand the
world's collective medical knowledge.

Think of it like a “smarter” UpToDate...

- Write a patient handout
- Ask about treatment alternatives
- Ask in a Language Other Than English
- Ask a Pop-Science Question
- Ask about Guidelines
- Double Check with a Quick Curbside Consult
- Write a Prior Auth Letter
- Ask about Drug Dosing
- Write Home Care Instructions
- Research a Topic
- Ask About Labs to Consider
- Ask about Drug Side Effects
- Ask for Evidence

Patient with an unknown ocular "tumor" found on direct examination at their ophthalmologist. No records provided but now having headaches. What do you recommend for the Emergency Department workup for an undifferentiated ocular tumor, thinking about life threatening diagnoses first.

✓ Please answer or skip the clarification questions in the following input box

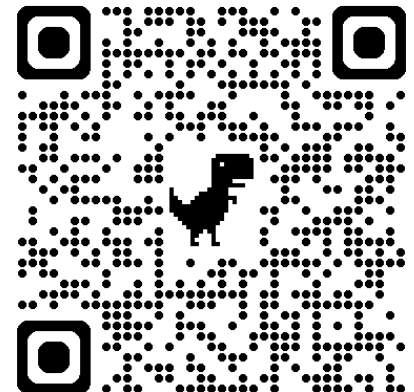
To optimize recommendations for emergency workup of an undifferentiated ocular tumor with associated headaches, further clinical details are essential.

1. Is there any evidence of visual changes, proptosis, or cranial nerve deficits on examination?
2. Are there any systemic symptoms such as fever, weight loss, or recent history of malignancy?
3. Was the tumor described as intraocular, orbital, or involving the eyelid/adnexa by the ophthalmologist?

You may answer as many of these questions as you like.

Approximately 2/3 visual field loss in the right eye. No proptosis, no cranial nerve deficits. No other focal asymmetry or weakness. no systemic systems. Unfortunately no additional information about the tumor other that it can be seen on dilated exam. No imaging has been performed.

✓ Research completed in 4min



Diagnosis and Differential for Acute Ocular Tumor

The clinical presentation of a patient with a visible ocular tumor, approximately two-thirds visual field loss in the right eye, no proptosis, no cranial nerve deficits, and no systemic symptoms is most consistent with a primary intraocular malignancy, with uveal melanoma being the leading diagnosis. Uveal melanoma is the most common primary intraocular cancer in adults, accounting for 90–95% of cases, and typically presents with a visible mass on dilated fundus examination and visual symptoms such as field loss or decreased acuity. The absence of proptosis and cranial nerve deficits suggests the lesion is confined to the globe, as extraocular extension or orbital involvement would more commonly produce these findings. Systemic symptoms are usually absent at initial presentation, as metastatic spread tends to occur later in the disease course. Quantitatively, approximately two-thirds of patients with uveal melanoma present with visual changes, and one-third are asymptomatic at diagnosis. The risk of metastasis is high, with the liver being the most common site, and once metastatic, the one-year mortality rate approaches 80%.^[1-2]

The differential diagnosis must also include choroidal metastasis, which is the most common intraocular malignancy overall, particularly in patients with a history of systemic cancer. Choroidal metastases present as visible masses, often with subretinal fluid and exudative retinal detachment, and are associated with a poor prognosis, with 5-year survival rates as low as 24% in large cohorts.^[3-4] Primary vitreoretinal lymphoma is another aggressive intraocular malignancy that can present as a mass lesion with visual field loss, often masquerading as chronic uveitis and carrying a poor prognosis due to frequent CNS involvement.^[5] Circumscribed choroidal hemangioma, a benign vascular tumor, can mimic malignancy but is less likely to cause acute, significant visual field loss and is often misdiagnosed at first presentation.^[6] Optic nerve sheath meningioma and optic pathway glioma are less likely but should be considered, especially if the lesion is peripapillary or the patient is a child.^[7-8] In pediatric patients, retinoblastoma is the most common intraocular malignancy and can present as a visible mass with visual field loss, but is exceedingly rare in adults.^[9]

Filters Export			
Laboratory Study	Rationale for Ordering	Priority in ED	References
ESR, CRP, CBC, Platelet Count	Rule out giant cell arteritis (if age >50 or suspicion)	High	[1-4]
Syphilis serology (RPR/VDRL)	Rule out infectious causes of ocular mass	Moderate	[2]
HIV testing	Rule out infectious/lymphoproliferative causes	Moderate	[2]
Tuberculosis screening	Rule out infectious causes (if risk factors present)	Moderate	[2]
CBC with differential	Screen for hematologic malignancy	High	[2]
Coagulation profile (PT/aPTT/INR)	Rule out hypercoagulable state (if vascular suspicion)	Moderate	[2]
D-dimer	Rule out systemic thromboembolism (if indicated)	Low	[2]
Basic metabolic panel	Screen for metabolic derangements	Low	[2]
LDH	Screen for systemic malignancy	Low	[2]
Blood cultures	Rule out systemic infection (if febrile or ill-appearing)	Low	[2]

Specialist Consultation Criteria

Immediate ophthalmology consultation is indicated for any patient with unexplained acute visual field loss and a visible ocular mass, as recommended by the American Academy of Ophthalmology. The risk

Summary of Actionable Recommendations

For this patient presenting with a visible ocular tumor and approximately two-thirds visual field loss in the right eye, with no proptosis, cranial nerve deficits, or systemic symptoms, the following evidence-based, stepwise ED management protocol is recommended:

A focused history and physical examination should be performed immediately, including measurement of visual acuity, pupillary responses (including evaluation for afferent pupillary defect), intraocular pressure, and a careful slit-lamp and fundusoscopic examination if feasible. The presence of a significant visual field defect, abnormal pupil reactivity, or optic disc findings increases the likelihood of a serious underlying pathology and should lower the threshold for urgent neuroimaging and specialist consultation.^{[15][25]}

Urgent MRI of the orbits and brain with and without contrast should be obtained as the first-line imaging modality, with contrast-enhanced CT as an alternative if MRI is unavailable or contraindicated. Imaging should be performed as soon as possible, ideally within hours of ED presentation, to guide further management and triage.^[11-14] For pediatric patients, MRI of the head and orbits with and without contrast is the most appropriate initial imaging.^[16-17]

Laboratory studies should be initiated in parallel, including ESR, CRP, CBC, and platelet count to rule out GCA in patients over 50 or with clinical suspicion, and CBC with differential to screen for hematologic malignancy. Additional infectious workup (syphilis serology, HIV testing, tuberculosis screening) may be considered based on risk factors and clinical suspicion.^{[5][10][20-21][23]}

Immediate ophthalmology consultation is indicated for assessment and management of the ocular tumor and visual loss. Urgent neurology or neurosurgery consultation should be obtained if imaging reveals intracranial extension, mass effect, or if there is suspicion of central visual pathway

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Why do good references matter?

Hallucinations and Confabulations

The ability to generate content that is **not grounded** in its training data or any real-world source, but still sounds plausible



Hallucination Rates and Reference Accuracy of ChatGPT and Bard for Systematic Reviews: Comparative Analysis

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Michel Azar¹ ; Marcel Deckert³ ; Jean-Luc Raynier¹ ; Gilles Clowez¹ ;
Pascal Boileau¹ ; Caroline Ruetsch-Chelli³ 

ChatGPT and Bard were used to replicate the results of systemic reviews using the same inclusion criteria.

Papers were considered “hallucinated” if any 2 of the following information were wrong: title, first author, or year of publication

Hallucination rates were 28.6% for ChatGPT-4 and 91.4% for Bard

Why do hallucinations happen?

“Hallucinations” are actually a **direct result** of how LLMs work

Probability-based prediction: LLMs predict which word is most likely to follow another. Truth is not a built-in criterion.

Lack of reliable grounding: Without connecting to external sources like knowledge graphs, databases, or retrieval-augmented generation (RAG) systems, the model is limited to its training data – and may reconstruct “facts” that never existed.

LLMs are NOT truth machines, but language machines

What about the training data?

All of these AI tools require a training data set, so that it can make those connections between words and data

HOWEVER, we know from non-AI examples that data, even clinical data, can be biased.

Meta-Analysis > JAMA Netw Open. 2024 Mar 4;7(3):e241127.
doi: 10.1001/jamanetworkopen.2024.1127.

Bias and Accuracy of Glomerular Filtration Rate Estimating Equations in the US: A Systematic Review and Meta-Analysis

Alice F Yan^{1 2}, Michelle Y Williams^{1 2}, Zumin Shi³, Richard Oyekan¹, Carol Yoon¹, Raffick Bowen⁴, Glenn M Chertow⁵

Affiliations + expand

PMID: 38441895 PMCID: PMC10915689 DOI: 10.1001/jamanetworkopen.2024.1127

> JAMA Intern Med. 2022 Jul 1;182(7):730-738. doi: 10.1001/jamainternmed.2022.1906.

Racial and Ethnic Discrepancy in Pulse Oximetry and Delayed Identification of Treatment Eligibility Among Patients With COVID-19

Ashraf Fawzy¹, Tianshi David Wu^{2 3}, Kunbo Wang⁴, Matthew L Robinson⁵, Jad Farha⁶, Amanda Bradke⁷, Sherita H Golden⁸, Yanxun Xu⁴, Brian T Garibaldi¹

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PMID: 35639368 PMCID: PMC9257583 DOI: 10.1001/jamainternmed.2022.1906

So when there is biased data, you may have biased AI output

Since AI is fast and not necessarily transparent on how it generates its responses, most people don't even think about the training data and its bias and therefore accept the results as valid.

How do you manage hallucinations and misinformation?

Most “interventions” involve fact-checking and due diligence

- * Ask for and check references
- * Use structured prompts
- * Adjust the tool’s temperature (creative vs factual)



Using the SPARK structured prompt

S - Situation

Who are you? What do you do?

What's the bigger context AI needs to understand before it can be useful?

P - Problem

What's the barrier in your way? Be specific. This isn't about fixing everything just name what's stuck.

A - Aspiration

Why do you care about solving this? What future are you trying to move toward?

R - Result

What does a good outcome actually look like? What would make you say, "This helped"?

K - Kick it to the tool

Now paste it into your AI platform and say:
"Give me 3-4 ideas based on this."

Using the SPARK structured prompt

S - Situation

I'm an Associate Dean in a medical school who oversees the clinical curriculum (typically 3rd and 4th year students) and has some visibility on the "basic science" curriculum in the 1st and 2nd year that focuses on foundational medical topics. We are in the process of curricular reform to provide better integration of clinical topics and "basic science" topics, as well including health system science, and topics that are timely such as health policy and AI.

P - Problem

We have been tasked with incorporating content about AI into the curriculum. It would probably work well as a longitudinal curriculum with 2-3 sessions per year. There is so much to cover, but want to focus on what medical students need to know about AI, specifically how to use it in general, risks/benefits, inherent problems with AI, and how and when to use it safely in the clinical environment.

A - Aspiration

We want to address this AI issue because without our guidance, students may choose not to use it, which could put them at a future disadvantage. Or they may use it incorrectly, dangerously, or inefficiently.

R - Result

What does a good outcome actually look like? What would make you say, "This helped"?

A good outcome would be a list of topics that should be covered that fit well into a traditional medical school curriculum. Thinking about 2-3 sessions per year. The topics should also list what the main objective of that topic should be about.

K - Kick it to the tool

"Give me 3-4 ideas based on this."

Absolutely — this is a timely and important project.

You're smart to approach this longitudinally, and to focus on *how students think about AI* rather than just *how to use a specific tool*, since the tools will evolve rapidly but the underlying principles will stay relevant.

Here are **two sample 4-year longitudinal curricula** — one that is more **conceptual and systems-oriented** (Curriculum A) and one that is more **practical and case-based** (Curriculum B). Both integrate nicely with a modern medical curriculum.

Sample Curriculum A – Foundations, Ethics, and Safe Use of AI

Focus: Develop **AI literacy**, ability to **critically appraise AI outputs**, and apply AI responsibly in patient care.

Year	Session	Topic	Main Objective
1	1	Introduction to AI in Medicine	Describe what AI is (machine learning, LLMs, predictive analytics) and differentiate between hype and reality.
	2	Bias, Fairness, and Equity in AI	Identify sources of bias in AI systems and discuss how they can worsen or reduce health disparities.
2	1	Clinical Data and AI: Garbage In, Garbage Out	Explain how data quality, missingness, and labeling impact AI performance and patient outcomes.
	2	AI in Diagnostics: Decision Support Tools	Analyze a real-world case (e.g., AI-assisted radiology) and discuss appropriate clinician oversight and error mitigation.
3	1	AI in Clinical Workflow & Documentation	Explore how AI is used for clinical note drafting, decision support, and order sets; discuss benefits and risks of automation bias.
	2	Patient Communication & AI	Practice explaining to a patient how AI contributed to their care plan, including limitations and uncertainties.
4	1	AI in Population Health & Health Policy	Evaluate how AI impacts resource allocation, public health surveillance, and reimbursement policy.
	2	Future of AI in Medicine & Lifelong Learning	Develop a framework for staying current with emerging AI tools, regulatory changes, and professional guidance post-graduation.

Sample Curriculum B – Case-Based, Practical AI

Focus: Teach **hands-on application** and **critical thinking** about AI tools using progressively complex cases.

Year	Session	Topic	Main Objective	
1	1	AI Literacy Bootcamp	Define AI, machine learning, and generative models; give students a chance to try a clinical chatbot to see its strengths and weaknesses.	
	2	Ethics and Bias Case Discussion	Work through a case where an AI triage system disadvantages a vulnerable population — students identify what went wrong and propose solutions.	
2	1	AI + Anatomy/Pathology Lab	Use image-recognition AI to explore histopathology or anatomy cases and discuss how to verify results against gold standards.	
	2	AI Failure Modes	Analyze cases where AI gave wrong answers — discuss automation bias, hallucinations, and human-in-the-loop safeguards.	
3	1	AI in Clinical Reasoning	Work through a simulated case: students generate a differential manually, then with AI assistance, and compare/critique results.	
	2	AI and Documentation	Practice using AI-generated drafts of notes or discharge summaries and refine them for accuracy, tone, and professionalism.	
4	1	AI in Precision Medicine	Evaluate how AI is applied to genomics, risk prediction, and individualized treatment plans.	
	2	Capstone: AI Policy & Professionalism Debate	Debate a future-focused question (e.g., “Should AI ever make autonomous treatment decisions?”) integrating ethics, policy, and clinical reasoning.	

Key Design Principles

- **Spiral curriculum:** Revisit AI concepts yearly, deepening sophistication.
- **Case-based integration:** Tie AI topics to anatomy, pathology, clinical reasoning, health systems.
- **Ethics + safety emphasis:** Address bias, accountability, automation bias, and communication early and often.
- **Practical exposure:** Give students direct experience with AI tools (sandboxed/educationally safe) so they learn when *not* to trust them.
- **Assessment options:** Reflection essays, OSCE stations using AI-augmented cases, group debates, or clinical note reviews.

Would you like me to map one of these curricula to **existing AAMC Core Entrustable Professional Activities (EPAs)** or **competency domains (e.g., ACGME milestones)**?

That would help make the case to your curriculum committee and show alignment with national standards.

Not using a prompt and taking the “Google approach”

Can you give me list of AI topics to teach medical students. Thinking about 2-3 sessions per year in medical school (total of 8-12). Can you give me two different lists to choose from?

Certainly! Here are two different lists of AI topics suitable for teaching medical students across 8-12 sessions, tailored for a progressive learning experience:

****List 1: Foundational and Practical AI Topics for Medical Education****

1. Introduction to AI in Healthcare: Concepts and Overview
2. Machine Learning Basics and Medical Data
3. AI in Medical Imaging and Diagnostics
4. Natural Language Processing in Healthcare
5. AI for Personalized Medicine and Treatment Planning
6. Ethics, Bias, and Safety in Medical AI
7. Data Privacy, Security, and Regulatory Aspects
8. AI Implementation in Clinical Workflow
9. Future Trends: AI and Telemedicine
10. Case Studies and Real-world Applications
11. Limitations and Challenges of AI in Medicine
12. Preparing Future Physicians for AI-Driven Healthcare

****List 2: Advanced and Specialized Topics for Medical Students****

1. Fundamentals of AI and Data Science in Medicine
2. Deep Learning for Image and Signal Analysis
3. AI Tools for Genomics and Precision Medicine
4. Reinforcement Learning and Decision Support Systems
5. AI in Drug Discovery and Development
6. Explainability and Interpretability of Medical AI
7. Addressing Bias and Ensuring Equity in AI
8. Interdisciplinary Collaboration in AI Projects
9. Legal and Ethical Challenges in Medical AI
10. The Role of AI in Global Health
11. Developing and Validating Medical AI Models
12. Preparing for AI-Enhanced Medical Practice and Innovation

Would you like me to generate a detailed curriculum outline or specific session content for either of these lists?