

Professional Development Series 7/17/26

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Evaluation and CME credit





Department of Medicine
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Empowering Faculty to Effectively Engage with AI and Learners in Clinical Settings

July 17, 2026

Learning Objectives

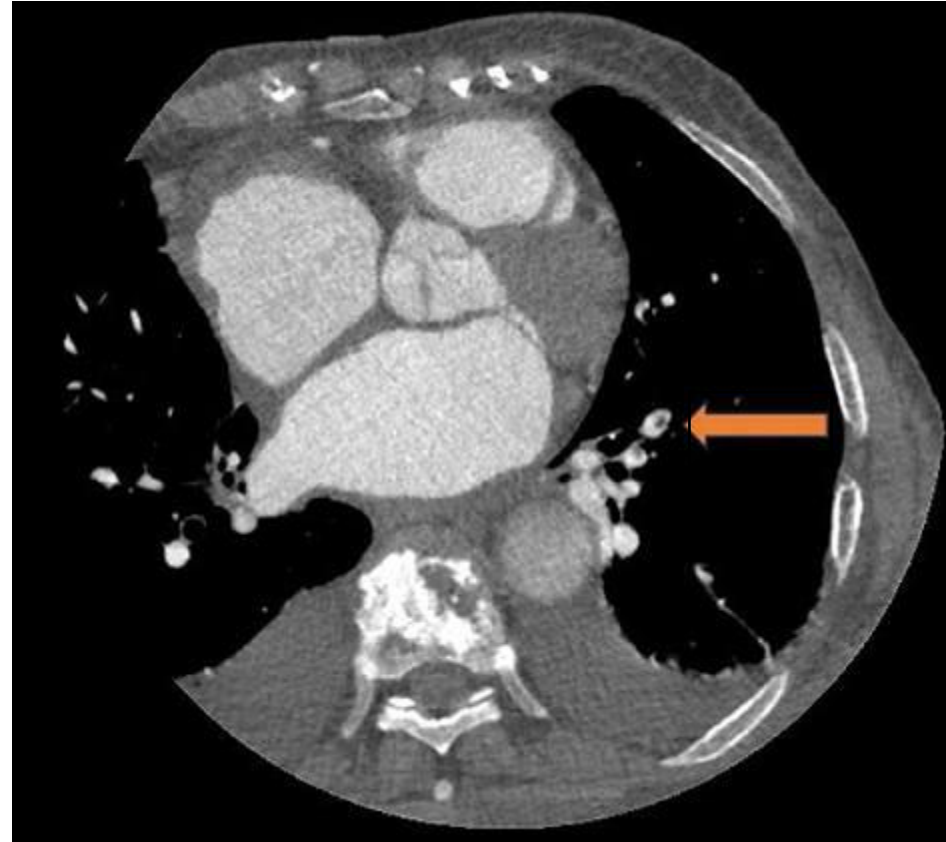
- Describe best practices for prompting artificial intelligence (AI) large language models (LLMs) when asking clinical questions.
- Audience members will practice composing LLM prompts, utilize specific frameworks to analyze and appraise prompts and LLM outputs, and discuss how to teach these concepts to clinical learners.
- Discuss how to help learners recognize potential biases and weaknesses of LLMs and how this affects internal and external validity of LLM outputs.
- Discuss the risk of de-skilling, never-skilling, and mis-skilling for all levels of learners, including faculty.
- Review institutional policy and guidance in order to maintain HIPPA when overseeing learners utilizing LLMs in clinical settings

This talk is not...

- A deep dive into AI scribes, AI discharge summaries or AI clinical applications
- A review of how to use AI for scholarly work
- A nuanced talk on how and why AI works
- A discussion on institutional level policy
- An endorsement or condemnation of AI



<https://www.goodmorningamerica.com/wellness/story/90-year-woman-washington-nursing-home-beat-coronavirus-69833704>



https://www.researchgate.net/figure/Left-lower-lobe-subsegmental-pulmonary-embolism-PE-on-a-CTA-targeting-the-left-atrial_fig4_393473506

How would
you handle
this
situation
on rounds?

Amongst hospitalized patients, please provide guideline-based evidence to support withholding anti-coagulation for a patient with an asymptomatic isolated sub-segmental pulmonary embolism.

Practice Guideline

The **American College of Chest Physicians (CHEST)** suggests **clinical surveillance over anticoagulation** in patients with isolated subsegmental pulmonary embolism (ISSPE) – but **only under specific low-risk conditions**.  **Chest** Critically, **hospitalization is explicitly listed as a risk factor that favors anticoagulation** rather than surveillance.

The guideline identifies the following risk factors for recurrent or progressive VTE that **favor choosing anticoagulation**:  **Chest**

- **Hospitalized patients or those with reduced mobility**
- Active cancer (particularly metastatic or on chemotherapy)
- No reversible risk factor for VTE (e.g., recent surgery)
- Pregnancy

From 2023 to 2024, AI use by physicians increased from 38% to 66%.

OpenEvidence[®]



ChatGPT

UpToDate[®] Expert AI



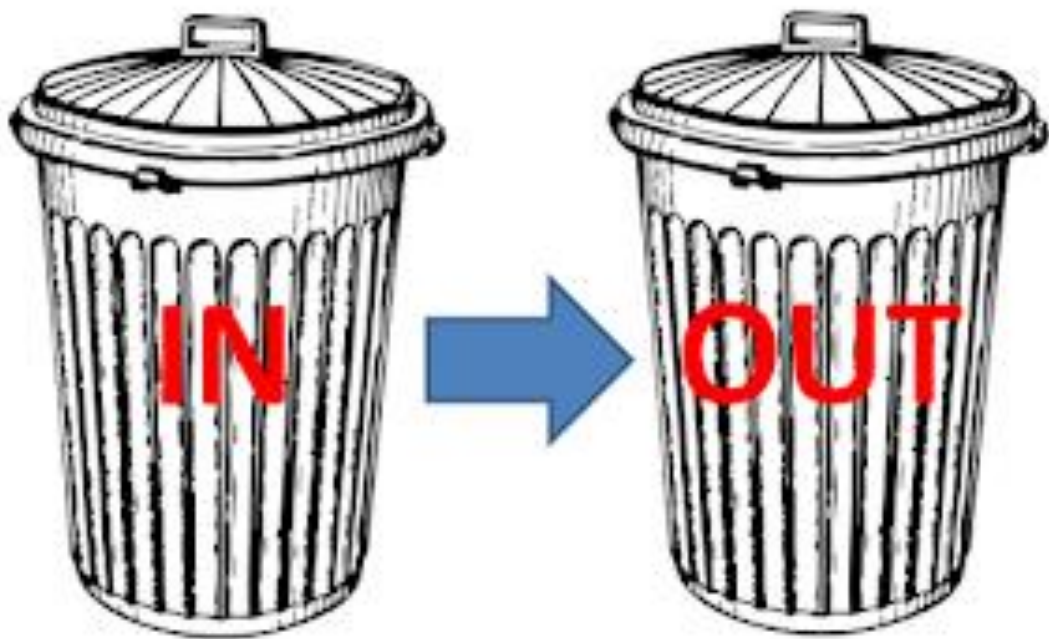
Claude

 Gemini

The Gemini logo features a blue four-pointed star icon followed by the word "Gemini" in a blue-to-purple gradient font.

Prompting AI Large Language Models

Prompting



<https://www.nickmilton.com/2016/12/garbage-lessons-in-garbage-knowledge-out.html>



<https://www.istockphoto.com/photos/doctor-on-phone>

Pair Share – Compare LLM Output with Your Neighbor

A 70-year-old female with a history of non-valvular atrial fibrillation presents with recurrent lower gastrointestinal (GI) bleeding. She is on apixaban for stroke prevention, with a CHA₂DS₂ VASc score of 7 (age, gender, peripheral arterial disease, hypertension, diabetes). In the last year, she has been hospitalized twice for GI bleed and required blood transfusions during both admissions. This admission, colonoscopy revealed angioectasias in the ascending colon which were treated. The most recent episode occurred within one month of resuming apixaban. She is concerned about her risk of re-bleeding if she resumes apixaban.

What is the evidence for/against anti-coagulation in this patient?

PICO+O Framework

- Patient/Population: Specifics for the patient/clinical population
- Intervention: Intervention or therapy of interest
- Comparison/control: What is the intervention therapy/compared to?
- Outcome: What outcomes do we/the patient care about?
- Output: What do we want the output to look like? What boundaries or constraints are required?

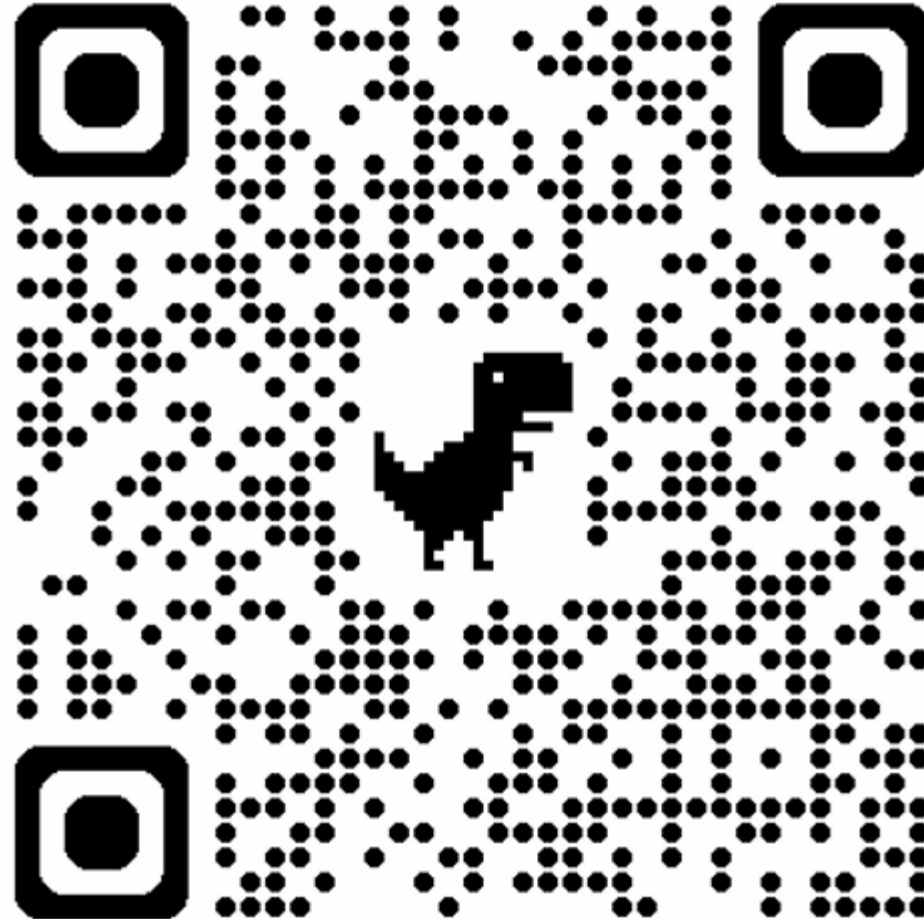
Back to our patient

- Population: Adults ≥ 65 with recurrent GI bleed due to colonic angioectasia
- Intervention: Discontinuation or dose-reduction of direct oral anti-coagulants
- Comparison: Continuation of full-dose direct oral anti-coagulant
- Outcome: Reduction in GI bleeding, thromboembolic events.
- PICO+O: Amongst adults older than 65 with recurrent GI bleed due to colonic angioectasia, does discontinuation or dose-reduction of direct oral anti-coagulants compared to continuation of full-dose direct oral-anticoagulant reduce GI bleeding events without significantly increasing thromboembolic risk? Summarize guideline-based evidence in three paragraphs or less and do not speculate.

No guideline-level evidence specifically addresses whether DOAC dose reduction or discontinuation – compared to full-dose continuation – reduces recurrent GI bleeding from colonic angioectasia without increasing thromboembolic risk...The 2023 ACG guideline on lower GI bleeding and the 2022 ACG-CAG guideline on anticoagulant management during GI bleeding both **emphasize that resumption of anticoagulation after GI bleeding is associated with reduced thromboembolic events and mortality**, albeit with a potentially increased risk of recurrent GI bleeding.

Many Prompting Frameworks

- TRACI
- CRAFT
- RISE
- RACE
- TAG
- PARA
- CLEAR
- Simple



<https://mccmscontent.mayo.edu/LSC/LearningStudio/PromptEngineeringBot.html>

Critical Appraisal of AI Outputs

Critically Appraising AI Outputs

- Cultivate a healthy sense of skepticism
- Should I trust this? Are there red flags?



Internal Validation

- Interrogate the AI model – do you get the same answer with different prompts?
- Re-prompt, with slight variation
 - Try a similar prompt
 - Ask the AI to provide an alternative approach
- Ask AI to:
 - Justify it's reasoning
 - Tell you the assumptions it is making

Back to our case

- A 70-year-old female with a history of non-valvular atrial fibrillation presents with recurrent lower gastrointestinal (GI) bleeding.
- She is on apixaban for stroke prevention, with a CHA₂DS₂ VASc score of 7 (age, gender, peripheral arterial disease, hypertension, diabetes).
- In the last year, she has been hospitalized twice for GI bleed and required blood transfusions during both admissions.
- This admission, colonoscopy revealed angioectasias in the ascending colon which were treated.
- The most recent episode occurred within one month of resuming apixaban.
- She is concerned about her risk of re-bleeding if she resumes apixaban.

Internal Validation – same prompt, re-worded

Summary

In this clinical scenario, the optimal approach is not discontinuation but rather a **multimodal strategy**: switch to apixaban if not already on it, pursue endoscopic treatment of accessible angioectasias, consider adjunctive somatostatin analogue therapy for recurrent bleeding, and reserve LAAO or thalidomide for truly refractory cases. Complete DOAC discontinuation should be avoided given the consistently demonstrated increase in thromboembolism and mortality.

Only difference between 1st and 2nd prompt: The 2nd includes “Do not speculate. Follow guidelines.”

No guideline supports permanent DOAC discontinuation as a preferred strategy in this population. The evidence consistently demonstrates that while discontinuation reduces GI bleeding recurrence, it **significantly increases thromboembolic events and mortality**. The guideline-concordant approach is to resume anticoagulation after achieving hemostasis and correcting reversible causes, preferentially using apixaban, with endoscopic treatment of angioectasias and consideration of pLAAO in patients with truly refractory or nonreversible bleeding sources.

External Validation

- Does the evidence align with established medical knowledge?
- Compare recommendations to:
 - Clinical practice guidelines
 - Trusted clinical references (e.g., NEJM and JAMA reviews, UpToDate)
 - Peer-reviewed literature
- Task: Review citations from the AI output

Levels of Evidence



External Validation – check sources

☰ References



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 Journal of the American College of Cardiology. 2024. Writing Committee Members, Joglar JA, Chung MK, et al. Guideline
2. **2020 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants: A Report of the American College of Cardiology Solution Set Oversight Committee.** 
 Journal of the American College of Cardiology. 2020. Tomaselli GF, Mahaffey KW, Cuker A, et al. Guideline
3. **The effects of anticoagulant therapy re-initiation after gastrointestinal bleeding: A systematic review and meta-analysis.**
Journal of Clinical Pharmacy and Therapeutics. 2021. Bingzheng X, Jingnan R, Ligang B, Jianping C. SR
4. **Management of Patients With Acute Lower Gastrointestinal Bleeding: An Updated ACG Guideline.** 
The American Journal of Gastroenterology. 2023. Sengupta N, Feuerstein JD, Jairath V, et al. Guideline

External Validation – check sources

1. 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines.



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 Journal of the American College of Cardiology. 2020. Tomaselli GF, Mahaffey KW, Cuker A, et al. Guideline

3. Thrombotic Events and Rebleeding After Hemorrhage in Patients Taking Direct Oral Anticoagulants for Non-Valvular Atrial Fibrillation.

 PloS One. 2021. Yanagisawa D, Abe K, Amano H, et al.

4. Risks Associated With Discontinuation of Oral Anticoagulation in Newly Diagnosed Patients With Atrial Fibrillation: Results From the GARFIELD-AF Registry.

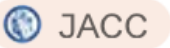
Journal of Thrombosis and Haemostasis : JTH. 2021. Cools F, Johnson D, Camm AJ, et al.

Relevance

- Is the recommendation from AI applicable to the individual patient?
- Consider:
 - Patient-specific factors (demographics, comorbidities)
 - Clinical context (acuity, setting)
 - Patient preferences
- Even if the output is factually accurate, it may not be relevant for your individual patient

Applying to our patient: Shared Decision-Making

- Nowhere was this mentioned in the AI outputs, regardless of prompt

The key principle is that **DOAC discontinuation should not be the primary strategy** for managing symptomatic anemia. The anemia should be addressed through iron repletion, endoscopic treatment, and adjunctive pharmacotherapy, while maintaining anticoagulation with the safest available agent. Discontinuation increases thromboembolic events (OR 0.54 favoring continuation) and all-cause mortality (OR 0.38 favoring continuation) — risks that outweigh the reduction in recurrent bleeding in most patients. 

Risks of AI in Clinical Settings

Bias in AI

- **Data bias**
- Algorithmic bias
- Confirmation bias
- Positivity bias

Data Bias: Medical Retrieval-Augmented Generation (RAG) Systems

- Medical RAG – LLM utilizes only “trusted” data sources to answer queries
- LLM queries validated external resources (guidelines, journal articles, abstracts, etc.)
- Open Evidence: “...includes open source articles from PubMed Central...knowledge base is very broad but opaque as Open Evidence doesn't share a list of sources. Answers may be based on evidence that is lower quality, or important sources may be missing.”
 - 40% of articles are open access
- Open Evidence: **only accesses freely available information**, such as abstracts, and *not always the entire article*
 - In 19% of articles, there are “major inconsistencies” between abstract and full text

Bias in AI

- Data bias
- **Algorithmic bias**
- Confirmation bias
- Positivity bias

Returning to our case

Step 4: Consider Left Atrial Appendage Occlusion if Refractory

For patients with a **nonreversible contraindication to long-term OAC**, the 2023 ACC/AHA guideline recommends percutaneous LAAO as reasonable (Class 2a, Level B-NR).  JACC

LAAO Evidence: 2 Trials, Different Results

CHAMPION-AF NEJM 2026

- LAAO was **noninferior** to DOAC in terms of composite of stroke or embolism
- LAAO was **noninferior** to DOAC in terms of non-procedure-related bleeding
- When procedure-related bleeding events were included, bleeding rates **did not differ** substantially between the 2 groups.

**Trial Sponsor:
Boston Scientific**

CLOSURE-AF NEJM 2026

- LAAO was **NOT noninferior** to DOAC in terms of preventing stroke, embolism, bleeding or CV death
- LAAO had **similar** rates to DOAC in terms of adverse events, such as bleeding

Bias in AI

- Data bias
- Algorithmic bias
- **Confirmation bias**
- Positivity bias

Bias in AI

- Data bias
- Algorithmic bias
- Confirmation bias
- **Positivity bias (sycophancy)**

Countering Positivity Bias

- AI wants to be agreeable – if you ask “does treatment X work” AI will be more likely to respond in the positive
- Mitigate positivity bias with prompt engineering
 - Prompt for critical analysis: tell AI to identify weaknesses, risks or flaws of a response
 - Prompt for contrast: request pros/cons or opposing viewpoints
 - Encourage skepticism: prompt with “challenge this idea” or “play devil’s advocate”
 - Ask AI to include clarifying questions: “Before providing a final answer, ask me clarifying questions”

Hallucinations/Confabulations

- AI LLMs generate confident but inaccurate/incorrect or made-up answers
- False but plausible answers – much like the confabulation seen in Korsakoff syndrome
- Higher risk when asking about rare disease or specific citations
- Lower risk when asking conceptual questions or pathophysiology questions

Additional Pitfalls of AI Use in Clinical Settings

Use of AI as a substitute for clinical reasoning rather than in support of clinical reasoning

- Atrophy in clinical reasoning and clinical recall
- Lost learning opportunity or superficial learning
- Learning (without AI) can be hard, but beneficial
- Dunning-Kruger Effect

Risks for Trainees

De-skilling

- Loss of skills the learner is beginning to acquire

Never-skilling

- Failure to acquire essential competencies in the first place

Mis-skilling

- Acquisition of incorrect behavior

Mis-Skilling: Risks are Higher in Less Experienced Trainees

- Study assessed PCPs and trainees using AI to diagnose otitis media
- Results:
 - AI improved accuracy across all groups
 - Automation bias was higher in less-experienced clinicians
 - **The trainees most likely to use AI are most likely to be misled by it**

	Without AI	With AI	Automation bias
Most experienced physicians	69%	80%	0.9
Least experienced physicians	61%	73%	1.2
Medical students	64%	74%	—

Protecting HIPAA and Policy Guidance for AI LLMs in Clinical Settings

Dartmouth Health AI Policy

DH Policy Title	Artificial Intelligence (AI) Use	Policy ID	36093
Keywords	AI		

IV. Policy Statement

Appropriate AI use guidelines:

- 1) Only AI tools which have been formally reviewed & approved by D-H are permitted for use for clinical care or business operations. Entering patient data, or business

confidential data into a non-approved tool, or public model may constitute a privacy violation or breach.

Examples of Reviewed/Approved AI tools:

- i. Epic AI tools (chart summary, discharge note draft, inbasket draft responses, etc.)
- ii. Abridge for ambient clinical documentation.
- iii. Webex
- iv. To request review and approval of a new tool, a request should be completed here: [New Technology Acquisitions](#)

Examples of Prohibited AI use with non-approved tools:

- i. Clinical data that HIPAA would refer to as de-identified or limited data sets are prohibited as AI may collect patient information or be able to re-identify an individual based on additional publicly available data.
 - ii. Uploading notes into **unapproved public models**, LLM or experimental tools.
- 2) Clinical decision support must be evidence-based, unbiased, auditable, and HIPAA-compliant. HIPAA compliance is determined by DH after application architecture review, IS Security review and contracting. Vendor reports of HIPAA compliance does not obviate review by DH.
 - 3) AI will be used in accordance with D-H's "Acceptable Information Technology (IT) Use" policy.

Prompting Public LLMs with Patient-Related Questions

Safe to Include in Your Prompt

- De-identified clinical details
 - Approximate age, sex, relevant vitals, labs)
- Generic clinical questions
- Synthesized scenarios using a rounded age and no name
- Drug interactions and dosing
- Workflow & documentation help
 - E.g., Draft a template for diabetes discharge education
- Literature questions
 - E.g., Summarize the TOPCAT trial results

NEVER Put in Your Prompt

- Copy-pasted chart notes
- Patient names or initials
- MRN, SSN, account numbers
- Exact dates
 - DOB, admission date, procedure date
- Geographic data below the state level
- PHI
 - HIPAA identifiers

LLM Use and Maintaining HIPAA – Trust Your Gut

- A male patient in his 70s from New Hampshire presents with symptoms consistent with presumed tick borne disease, provide an evidence based testing strategy to diagnose common and uncommon tick borne diseases endemic to New England.
- A 71 year-old male patient from Lyme, New Hampshire presents with confirmed Powassan infection, provide evidenced based strategies for treatment.

Dartmouth Internal Medicine AI Policy

Ambient Listening for Clinical Documentation

- Interns: not allowed
- PGY2s: only HPI
- PGY3s: All aspects of the note (including A&P)
- Residents must review all portions of note generated by AI
- *May be exceptions at the discretion of PD or longitudinal clinic preceptors*

Other Use of Generative AI in Clinical Practice

- If using generative AI to create prior authorization letters, provide patient advice, etc:
 - Must **never** enter PHI into generative AI engine



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Questions?

Sources

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