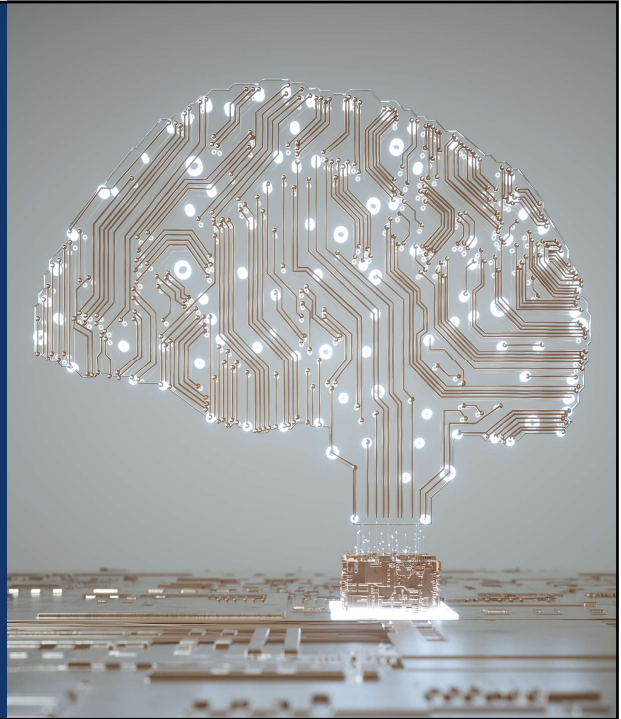


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The Benefits of Incorporating AI Tools in Fellow Education

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Uses for AI in Medical Education



Brainstorm
&
Draft



Summarize
&
Analyze



Edit
&
Refine

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Brainstorm & Draft

Education:

- Lecture learning objectives & outlines
- Multiple-choice questions & clinical vignettes
- Schedules for clinical rotations
- Letters of recommendation

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Lecture LOs & outline

I am a faculty member in rheumatology who has been asked to give a one-hour lecture to rheumatology fellows on rheumatoid arthritis. Please provide learning objectives and an outline of the talk appropriate to this audience.

Here's a proposed set of learning objectives and an outline for your lecture on rheumatoid arthritis (RA) tailored to rheumatology fellows:

Learning Objectives:

1. **Pathophysiology:** Explain the immunologic mechanisms underlying the development of rheumatoid arthritis.
2. **Diagnosis:** Apply the 2010 ACR/EULAR classification criteria for the diagnosis of RA.
3. **Management:** Describe evidence-based approaches to the pharmacologic and non-pharmacologic management of RA, including recent advancements.
4. **Complications:** Identify systemic manifestations and complications of RA, including cardiovascular risks and interstitial lung disease.
5. **Monitoring and Outcomes:** Discuss strategies for disease monitoring and optimizing treatment outcomes, including the role of treat-to-target.

Lecture Outline:

I. Introduction (5 minutes)

- Importance of RA in rheumatology practice
- Prevalence and impact on quality of life and healthcare burden

II. Pathophysiology of RA (10 minutes)

- Overview of genetic and environmental risk factors (e.g., HLA-DR4, smoking)
- Key immunologic pathways (e.g., role of T cells, B cells, cytokines like TNF- α , IL-6)
- Synovial inflammation and joint destruction

III. Diagnosis (10 minutes)

- 2010 ACR/EULAR classification criteria for RA
- Differential diagnosis: distinguishing RA from other inflammatory and non-inflammatory arthritides
- Role of serologic markers (RF, anti-CCP antibodies) and imaging (ultrasound, MRI)

IV. Management (20 minutes)

- Pharmacologic treatments

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Multiple-choice questions

You are a rheumatologist assigned the task of developing board-style multiple-choice questions to test rheumatology fellows' ability to distinguish between various types of inflammatory arthritis. Write 5 boards-style multiple-choice questions on this topic using ABIM best practices for question-writing.

Question 4

A 58-year-old man presents with acute onset of severe pain, redness, and swelling in the right first metatarsophalangeal (MTP) joint. He reports similar episodes in the past, which resolved spontaneously within a few days. Laboratory evaluation reveals a serum uric acid level of 9.2 mg/dL. Joint aspiration demonstrates needle-shaped crystals with negative birefringence under polarized light.

What is the most likely diagnosis?

- A. Gout
- B. Septic arthritis
- C. Pseudogout
- D. Rheumatoid arthritis

Correct Answer: A. Gout

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Multiple-choice questions

These questions are too easy for rheumatology fellows. Please increase the difficulty of the questions and lengthen the clinical vignettes.

Question 5

A 62-year-old man presents with recurrent episodes of pain and swelling in the right first metatarsophalangeal (MTP) joint, left ankle, and right knee. He has a history of chronic kidney disease (CKD) stage 3. Laboratory evaluation shows:

- Serum uric acid: 10.5 mg/dL (normal <7 mg/dL)
- ESR: 45 mm/hr
- CRP: 20 mg/L

Joint aspiration from the right knee reveals needle-shaped crystals with strong negative birefringence under polarized light. Dual-energy CT confirms urate crystal deposits in the involved joints.

Which of the following is the best long-term management strategy for this patient?

- A. Febuxostat with dose adjustment for renal function
- B. Allopurinol at the starting dose of 100 mg daily without titration
- C. Probenecid in combination with colchicine
- D. Dietary changes only



Correct Answer: A. Febuxostat with dose adjustment for renal function

Schedule building

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JE

The 4+1 block scheduling is a popular format used in medical residency programs. Here's a brief overview:

4+1 Block Schedule:

In the 4+1 block scheduling format, residents spend 4 weeks in a core rotation or elective, followed by 1 week in an ambulatory clinic or a different rotation. This 5-week block is then repeated throughout the year.

Given that you have 15 residents per year, a 52-week year would be divided into ten 5-week blocks. Over the course of the year, each resident would have 10 core/elective rotations and 10 ambulatory clinic weeks.

Steps to Create a Schedule:

1. **Define Rotations:** First, list out all the rotations that residents need to complete over the course of the year. Some rotations might be mandatory for all residents, while others might be electives.



**Excel
spreadsheet**

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Letter-writing

Spicer_LOR Questionnaire_Olsen.d...
Document

I am a faculty member in infectious diseases who needs to write a letter of recommendation for internal medicine for the medical student who completed the attached questionnaire. Please write a 1-2 page letter of recommendation for them.

To Whom It May Concern,

It is with great enthusiasm that I write to recommend [Student Name] for a position in your Internal Medicine residency program. As a faculty member in infectious diseases at [Your Institution], I have had the privilege of observing [Student Name]'s growth and accomplishments during medical school. [Student Name] embodies the qualities of an exemplary future internist, with her unwavering commitment to patient-centered care, leadership, and advocacy.

[Student Name]'s ability to foster connection and community is remarkable. She excels at creating a safe space for her patients and team members alike, ensuring everyone feels valued and heard. Her role as Co-Director for the Student Taskforce for ACEs and Resilience (STAR) exemplifies this strength. Under her leadership, STAR not only developed innovative trauma-informed care medical education but also organized three highly successful annual Trauma-Informed Care conferences, each attracting over 200 attendees and 20 speakers globally. Her ability to identify

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Moreover, [Student Name]'s passion for health equity extends beyond academics. As Co-Director of Physicians for Human Rights, she collaborated with community partners to provide medical evaluations for asylum-seeking individuals, demonstrating her ability to address complex social and medical challenges with compassion and innovation. Her leadership in civic engagement campaigns, mobilizing over 100 volunteers to promote voting rights at Grady and Emory, underscores her proactive approach to creating systemic change.

Colleagues and peers consistently describe [Student Name] as thoughtful, proactive, and reliable. She builds trust effortlessly through her thoroughness, follow-through, and integrity. Her dedication to lifelong learning is evident in her pursuits outside medicine, including art and meditation, which contribute to her resilience and ability to navigate the demands of a rigorous medical career.

In summary, [Student Name] is a compassionate leader, a dedicated learner, and an advocate for equity—qualities that make her an outstanding candidate for Internal Medicine residency. I am confident she will bring the same passion, commitment, and excellence to your program that she has demonstrated throughout her medical training.

A bit generic....

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Can you revise the letter to emphasize: 1) her ability to lead and work within a team, correlating that to her potential to work as a team member within medicine, 2) her curiosity and passion for learning and how that will help her work well with patients, and 3) her exceptional medical knowledge and clinical reasoning. Use specific examples from the questionnaire to illustrate these strengths, and bold key phrases or sentences to make them stand out.

Equally impressive is [Student Name]'s **insatiable curiosity and passion for learning**, which are foundational to her ability to connect with patients and adapt to their needs. Her decision to pursue a Master of Public Health in Epidemiology reflects her deep commitment to understanding systemic health inequities. Her thesis on chronic health issues associated with adverse childhood experiences demonstrates her ability to integrate academic inquiry into addressing real-world challenges. Beyond academics, she embraces lifelong learning through artistic pursuits, including pottery, drawing, and painting, which have taught her to **navigate ambiguity and embrace imperfection**. These qualities enable her to approach patient care with empathy, resilience, and creativity, ensuring she can adapt to complex medical and social challenges.

Finally, [Student Name]'s **exceptional medical knowledge and clinical reasoning** set her apart. Her peers and mentors consistently praise her for her **thoroughness, reliability, and ability to synthesize information** to make sound clinical decisions. Her passion for trauma-informed care has directly influenced her clinical approach, ensuring that patients feel heard and supported. In

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Summarize & Analyze

- Identify common **learner misconceptions** using essay responses

Sample prompt:

The attached document collates learner responses to the essay question "...". Based on the students' responses, can you identify and categorize common student misconceptions?

- Categorize **evaluation data** using the ACGME milestones

Sample prompt:

Use the attached ACGME milestones to categorize the narrative comments from the attached evaluation summaries within each milestone. Only use direct quotes from the evaluations. List any remaining uncategorized quotations from the evaluations at the end of the output.

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Edit & Refine

Professional biographies, emails, manuscripts, speeches, workshop submissions, etc.

I am a rheumatology program director an email response to "...". Can you edit the following email to make it sound more polished and professional?



Certainly! Please share the email text, and I'll edit it for a more polished and professional tone.

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Prompt Engineering – A Method to Improve Outputs

Be as specific as possible, providing the platform with a clear **task**, including any specific guidelines regarding **structure or format**, and including important information regarding your **role or context**

You are a rheumatology faculty member writing multiple-choice questions for a rheumatology fellowship board examination. Please write 5 multiple-choice questions that assess a fellows' ability to distinguish between and manage inflammatory arthritis. Follow standard guidance and best practices for formulating multiple-choice questions as outlined by the ABIM.

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Potential Pitfalls related to AI

| Issue | Description | Solution |
|----------------|-------------|----------|
| Hallucinations | | |
| Privacy | | |
| Bias | | |

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Potential Pitfalls related to AI

| Issue | Description | Solution |
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| Hallucinations | Incorrect information | Carefully fact-check outputs |
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Potential Pitfalls related to AI

| Issue | Description | Solution |
|----------------|-----------------------------|---|
| Hallucinations | Incorrect information | Carefully fact-check outputs |
| Privacy | Patient & learner data laws | De-identify and/or use approved platforms |
| Bias | | |

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Potential Pitfalls related to AI

| Issue | Description | Solution |
|----------------|-----------------------------|---|
| Hallucinations | Incorrect information | Carefully fact-check outputs |
| Privacy | Patient & learner data laws | De-identify and/or use approved platforms |
| Bias | Data in = data out | Consider the risk for bias |

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Take Home Points

- Consider how generative AI platforms can be used to simplify your workflow by drafting, summarizing, or editing.
- Prompt engineering is an important skill that will optimize the output that you get.
- Be cognizant of the potential for hallucinations and bias, and keep in mind any regulations regarding patient or learner privacy.

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Questions?

QR code to
handout with
references

