

モーニングレクチャー2025年9月1日

現場で出会う問題
～AI時代にどうアクションするか～

神戸大学医学部附属病院 総合内科
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おうちに帰る
➤

一緒に考える
➤

アイデア・工夫
➤



ChatGPT

OpenEvidence[®]

困ったらどうやって調べています？



実臨床は立体

AIは点

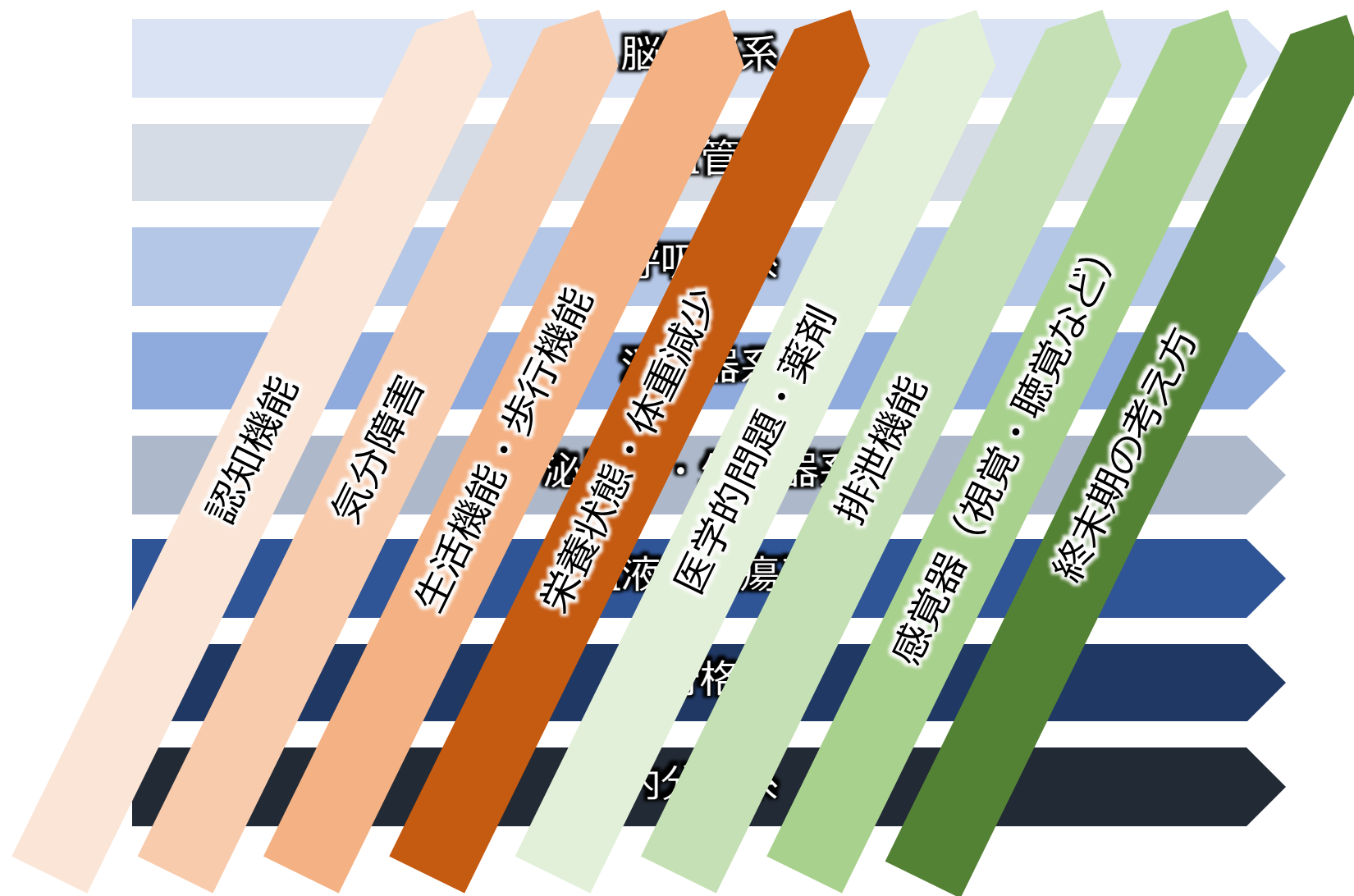
目標

- AIが出した答えをどう“活かすか”を考える
- 臓器別診断だけでなく、高齢者特有の考え方やトレンドを組み込む
- **AIの点を臨床の立体に変換するフレームワーク**を体得

システムと老年症候群

脳神経系	認知機能
心血管系	気分障害
呼吸器系	生活機能・歩行機能
消化器系	栄養状態・体重減少
泌尿器・生殖器系	医学的問題・薬剤
血液・腫瘍系	排泄機能
筋骨格系	感覚器（視覚・聴覚など）
内分泌系	終末期の考え方

システムと老年症候群の重なり



病棟や在宅でのコールにどう活かすか

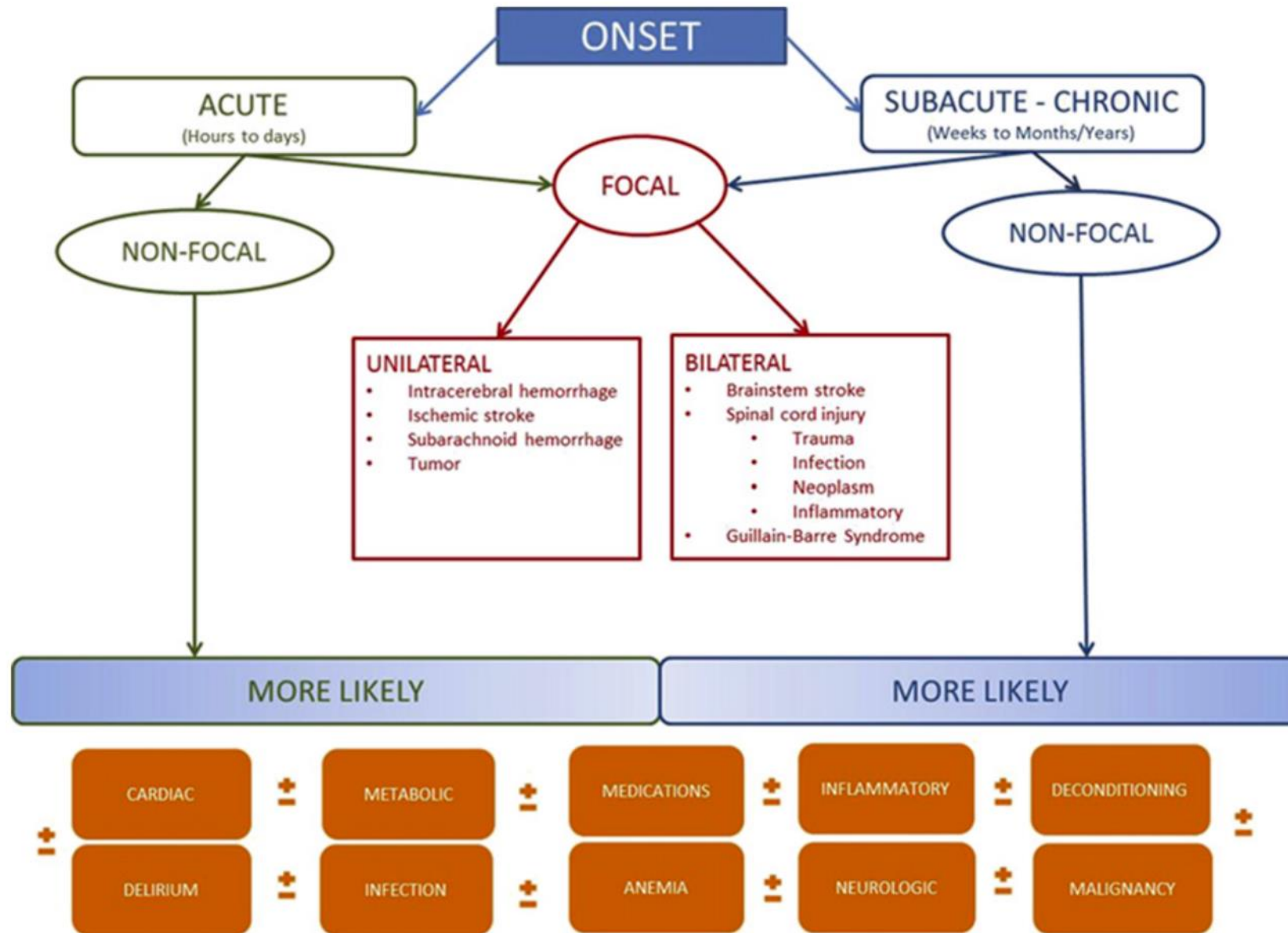


Fig. 1. Diagnostic network for weakness by onset and focality.

ステップ

1. オンセット 時間軸 トレンド

- 急性（数時間～数日）
- 亜急性・慢性（数週～年単位）

2. フォーカス

局在・システム性の有無

- Focal
臓器・システムで説明できる症状
- Non-focal
臓器で割り切れない症状

3. 組み合わせ

- 「急性 + Focal」
→ 脳卒中、心筋梗塞などシステム性疾患
- 「急性 + Non-focal」
→ 感染、代謝異常、薬剤副作用、せん妄など
多因子鑑別
- 「慢性 + Non-focal」
→ 認知症、フレイル、抑うつなど

AIとの組み合わせ

ChatGPTやOpenEvidenceが返す答えは、
臓器別・疾患別の「Focal情報」寄り

実臨床では「Non-focal症状」や「トレンド情報」が多い

→そこで「**オンセット × フォーカス**」という軸を導入すれば、
AIの出した答えを**より安全に、臨床的に活かすフレーム**になる

Focal (局在、システム性)

系統的評価

AIやマニュアルなど

酸素化低下
呼吸困難

発熱

急性

慢性

活気がない
様子の変

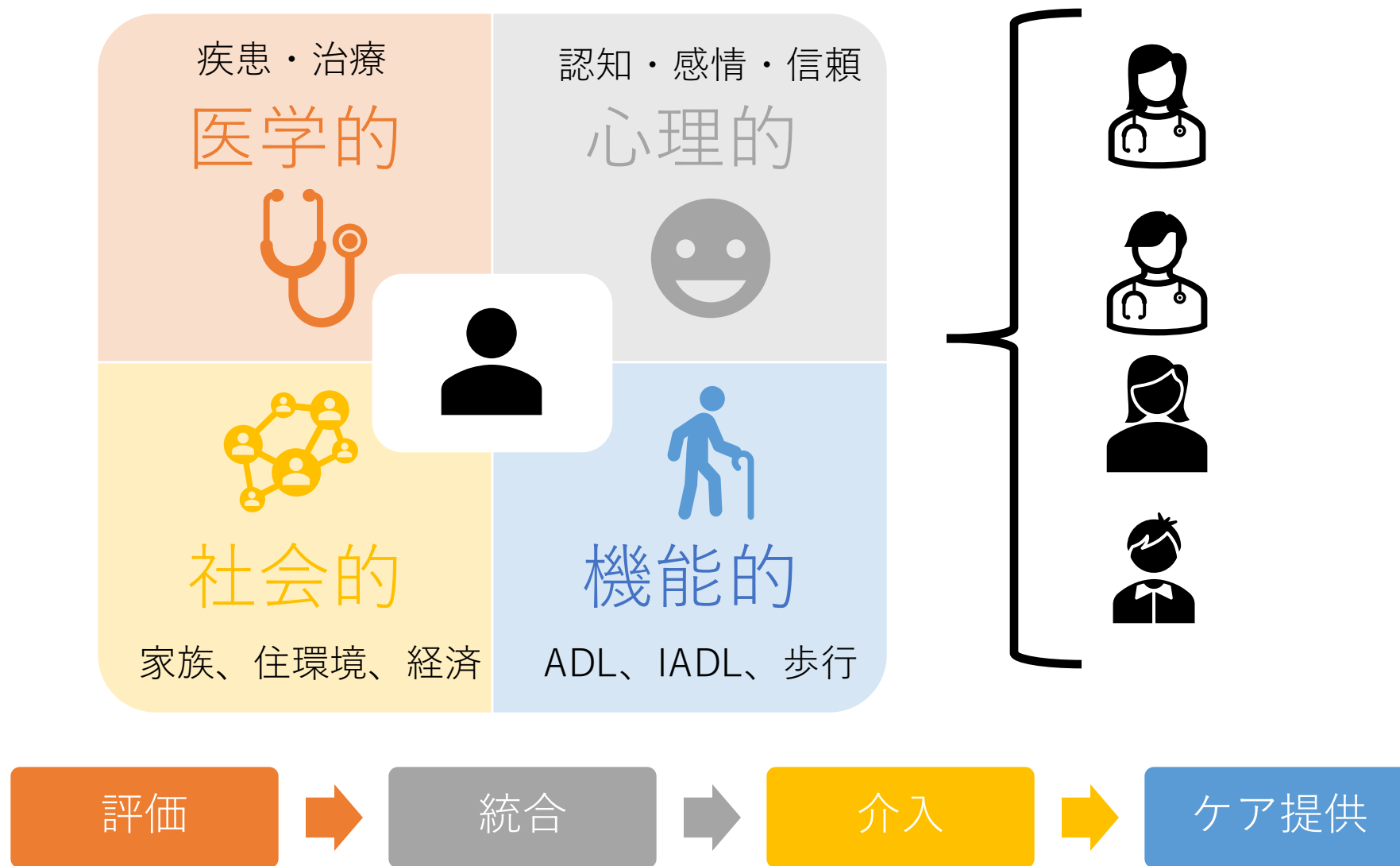
力が入らない
体動困難

食べられない

包括的評価
高齢者のフレームワーク

Non-Focal

CGA | 多次元・多職種のアプローチ



DEEP-IN

項目	内容
D	Dementia（認知症） / Depression（うつ） / Delirium（せん妄） Drugs（薬剤）
E	Eye（視力）
E	Ear（聴力）
P	Pain（疼痛） / (F)all（転倒）
P	Physical function（身体機能）
I	Incontinence（失禁）
N	Nutrition（栄養）

Geriatric 5M

M obility	身体機能
M ind	精神・心理、認知機能
M edication	薬
M ulti-complexity	多様な疾患、社会的ニーズ
M atters Most to Me	価値観、何が大切か

ケース | 84歳 軽度認知症の男性

- 大腿骨頸部骨折で整形外科10日前から入院し手術
- 術後経過良好で、リハビリをしながら転院調整中
- 2日前から夜間に大きな声をあげて暴れたり、家に帰ると訴えベッドから立ち上がろうとする
- 話しかけているのに、目を合わせずぼーっとしている
- 日中は食欲減退し、夜間是不眠
- 見当識障害あり
- 家族からは「入院前と様子が違う、認知症が進んだ？」



AIに聞いてみた

みなさんどうします??

入院中の高齢者の元気が無いときの鑑別は？

▼ Finished thinking

入院中の高齢者の元気が無い（活気低下、**apathy, hypoactivity, “failure to thrive”**）場合の鑑別診断は以下の通りです。

Most Likely Diagnoses（最も頻度が高い鑑別）：

1. **薬剤副作用・ポリファーマシー**：高齢者は多剤併用による副作用（鎮静、せん妄、低血圧、低Na血症など）や薬物相互作用が多く、元気消失の主因となります。^[1]
2. **貧血（鉄欠乏性、慢性疾患、消化管出血）**：高齢者の鉄欠乏や貧血は、易疲労感や活気低下の原因となります。^[2]
3. **感染症（尿路感染、肺炎、潜在性菌血症）**：高齢者では典型的な発熱や局所症状が乏しく、元気消失や食欲低下のみで発症することが多いです。^[3]
4. **甲状腺機能低下症**：非特異的な症状（倦怠感、抑うつ、認知機能低下）で発症することが多く、血液検査でのスクリーニングが重要です。^[4]
5. **うつ病・気分障害**：高齢者のうつ病は身体症状（食欲低下、活動性低下、疼痛）として現れることが多く、見逃されやすいです。^[5]
6. **睡眠障害・入院環境による睡眠断片化**：入院中の環境要因（騒音、夜間のケア）やサーカディアンリズムの乱れが活気低下に寄与します。^[6]
7. **廃用症候群・不動化**：ベッド上安静や活動性低下により、筋力低下やフレイルが急速に進行します。American Heart Associationも高齢者の不動化のリスクを強調しています。^[7]
8. **低栄養・脱水**：高齢者は低栄養や脱水に陥りやすく、活気低下や意識障害の原因となります。^[8]

Most Important Not to Miss Diagnoses（絶対に見逃してはならない疾患）：

1. **急性冠症候群（ACS）・心筋梗塞**：高齢者では胸痛を訴えず、元気消失や意識障害のみで発症することがあるため、American Heart Associationは心電図やバイオマーカーの評価を推奨しています。^[9]
2. **敗血症（尿路・肺・カテーテル関連感染など）**：感染症の症状が非典型的なため、バイタルサイン、血液培養、尿検査、胸部X線などで評価が必要です。Infectious Diseases Society of Americaも早期の感染源検索を推奨しています。^[10]
3. **頭蓋内出血（特に慢性硬膜下血腫）**：転倒歴や抗凝固薬内服例では、軽度の意識障害や元気消失のみで発症することがあり、Canadian Medical Association JournalのFalls Decision Ruleも参考になります。^[11]

追加で確認すべき主な問診・検査項目：

- ・服薬歴・新規薬剤追加の有無
- ・バイタルサイン、身体診察（脱水、感染、神経所見）
- ・血算、CRP、電解質、腎機能、TSH、鉄関連検査
- ・尿検査、胸部X線、必要に応じて頭部CT
- ・栄養評価（体重変化、食事摂取量、Mini Nutritional Assessment）
- ・うつ病スクリーニング（GDS, PHQ-9）

このように、元気が無い高齢入院患者では、薬剤、感染、心血管疾患、内分泌、精神疾患、栄養・廃用など多角的な視点で評価することが重要です。■

Most Likely Diagnoses

(頻度が高い)

鑑別・要因	ポイント
薬剤副作用 ポリファーマシー	鎮静、せん妄、低血圧、低Na、薬物相互作用
貧血	鉄欠乏性、慢性疾患、消化管出血による易疲労感
感染症	尿路感染、肺炎、潜在性菌血症。典型的症状なく活気低下のみ
甲状腺機能低下症	倦怠感、抑うつ、認知低下。血液検査でスクリーニング
うつ病・気分障害	食欲低下、活動性低下、疼痛など身体症状が主体
睡眠障害 入院環境	騒音・夜間ケアによる断眠、サーカディアンリズム障害
廃用症候群 不動化	ベッド上安静で筋力低下・フレイル進行
低栄養・脱水	食事摂取低下、脱水による意識障害・活気低下

Most Important Not to Miss Diagnoses

(見逃せない)

鑑別・要因	ポイント
ACS・心筋梗塞	高齢者は胸痛なしで発症、元気消失のみのことも
敗血症	非典型的発症。バイタル、培養、尿検査、X線が必須
頭蓋内出血 慢性硬膜下血腫	転倒歴、抗凝固薬使用例で元気低下のみもあり

追加で確認すべき項目

項目	ポイント
服薬歴	新規薬剤追加の有無
バイタル・身体診察	脱水、感染、神経所見
検査	CBC, CRP, 電解質、腎機能、TSH、鉄関連
画像・尿検査	尿検、胸部X線、頭部CT（必要時）
栄養評価	体重変化、食事摂取量、MNA
精神評価	GDS, PHQ-9 でうつ病スクリーニング

項目	ポイント
服薬歴	新規薬剤追加の有無
バイタル・身体診察	脱水、感染、神経所見
検査	CBC, CRP, 電解質、腎機能、TSH、鉄関連
画像・尿検査	尿検、胸部X線、頭部CT（必要時）
栄養評価	体重変化、食事摂取量、MNA
精神評価	GDS, PHQ-9 でうつ病スクリーニング

この通り行いますか？
どこまでまずしますか？？



トレンドの確認
カルテレビュー



AIは点

ケース | 78歳男性、パーキンソン病の既往あり

- 腎盂腎炎で入院。抗菌薬で改善 → リハビリ中。
- **ADL**：入院前は杖歩行、食事は自立していたが最近むせこみ増加
- 内服：抗パーキンソン薬、降圧薬
- 入院してからは傾眠傾向、呼名で開眼するがぼんやり
- 夜22時すぎ、病棟でナースコール
- 「かんざわさん、SpO₂が下がっています！今88%です！」
- あなたはベッドに駆けつける



AIに聞いてみた

AIに限らずみなさんどうします??

入院中の高齢者の酸素化低下のアプローチは？

▼ Finished thinking

Most Likely Diagnoses

高齢入院患者の**酸素化低下**の主な原因は、**無気肺**（術後や不動化による）、**肺炎（特に誤嚥性）**、**急性心不全／心原性肺水腫**、**COPD増悪**、**肺塞栓症**、**胸水**、および**薬剤・オピオイドによる低換気**です。無気肺は術後や長期臥床で頻発し、画像診断や肺音減弱で評価します。誤嚥性肺炎は高齢者で多く、臨床的には急性発症の呼吸困難や意識障害、画像上の後方浸潤が特徴です。心不全は両側性胸水やう音、頸静脈怒張などで疑い、American College of Cardiologyは心不全入院患者の包括的評価を推奨しています。COPD増悪は呼吸困難・咳・喀痰増加で疑い、重症例では入院管理と酸素投与、短期ステロイド（30-40mgプレドニゾロン3-7日）が推奨されます。肺塞栓症は高齢者で非典型的症状（失神、呼吸困難）を呈し、American Heart Associationは年齢調整Dダイマーや画像診断を推奨しています。胸水は心不全、感染、悪性腫瘍などが原因で、超音波や胸部X線で評価し、必要に応じて穿刺・Lightの基準で鑑別します。薬剤性低換気はオピオイドや中枢抑制薬で起こり、American College of Chest PhysiciansはNIV（非侵襲的換気）導入を推奨しています。^[1-7]

Most Important Not to Miss Diagnoses

緊張性気胸は急激な呼吸不全・血圧低下を伴い、胸部X線や超音波で迅速に診断し、即時穿刺・ドレナージが必要です。**ARDS／重症敗血症**は急性発症の低酸素血症・両側浸潤影で疑い、敗血症患者ではバイオマーカーやPaO₂/FiO₂比で重症度評価が有用です。**急性心筋梗塞によるフラッシュ肺水腫**は胸痛・急性呼吸不全で発症し、心電図・心エコー・トロポニン測定が必要です。^[8-10]

追加で確認すべき主な問診・検査項目

- 急性発症か慢性か、既往歴（心不全、COPD、脳卒中、悪性腫瘍）
- 服薬歴（オピオイド、鎮静薬、利尿薬）
- バイタルサイン、SpO₂、呼吸音、頸静脈怒張、下肢浮腫
- 胸部X線、超音波、CT（必要時）、血液ガス分析
- Dダイマー、BNP、トロポニン、CRP、血算
- 必要に応じて胸水穿刺、喀痰培養、心エコー

初期対応は酸素投与、原因疾患への迅速な治療（抗菌薬、利尿薬、NIV、ドレナージなど）を優先します。

Most Likely Diagnoses
(頻度が高い)

主な疾患	特徴／所見	初期対応
無気肺	術後・長期臥床で頻発、肺音減弱、X線で区域性虚脱	体位ドレナージ、リハビリ、吸引
誤嚥性肺炎	高齢者に多い、急性呼吸困難や意識障害、後方浸潤影	抗菌薬、吸引、酸素投与
急性心不全／肺水腫	両側性胸水、ラ音、頸静脈怒張	酸素、利尿薬、NIV
COPD増悪	呼吸困難・咳・喀痰増加	酸素、短期ステロイド、吸入 β 刺激薬
肺塞栓症	非典型（失神、呼吸困難）	抗凝固療法
胸水	心不全、感染、悪性腫瘍	原因治療、必要に応じ穿刺
薬剤性低換気	オピオイド・中枢抑制薬	酸素、NIV、中止調整

Most Important Not to Miss Diagnoses
(見逃せない)

疾患	特徴／所見	初期対応
緊張性気胸	急激な呼吸不全・血圧低下	即時穿刺・ドレナージ
ARDS／重症敗血症	急性低酸素血症、両側浸潤影	抗菌薬、人工呼吸管理
急性心筋梗塞によるフラッシュ肺水腫	胸痛、急性呼吸不全	酸素、利尿薬、ACS治療

追加で確認すべき項目

項目	追加で確認
問診・病歴	発症形式（急性／慢性）、既往歴（心不全、COPD、脳卒中、悪性腫瘍）、服薬歴（オピオイド、鎮静薬、利尿薬）
身体所見	バイタル、SpO ₂ 、呼吸音、頸静脈怒張、下肢浮腫
検査	胸部X線、超音波、CT（必要時）、血液ガス、Dダイマー、BNP、トロポニン、CRP、血算
追加検査	胸水穿刺（Light基準）、喀痰培養、心エコー
初期対応共通	酸素投与、原因疾患の迅速治療（抗菌薬、利尿薬、NIV、ドレナージなど）

追

項目	追加で確認
問診・病歴	発症形式（急性／慢性）、既往歴（心不全、COPD、脳卒中、悪性腫瘍）、服薬歴（オピオイド、鎮静薬、利尿薬）
身体所見	バイタル、SpO ₂ 、呼吸音、頸静脈怒張、下肢浮腫
検査	胸部X線、超音波、CT（必要時）、血液ガス、Dダイマー、BNP、トロポニン、CRP、血算
追加検査	胸水穿刺（Light基準）、喀痰培養、心エコー
初期対応共通	酸素投与、原因疾患の迅速治療（抗菌薬、利尿薬、NIV、ドレナージなど）

この通り行いますか？
どこまでまずしますか？？



超音波検査
(POCUS)

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

MEDICAL EDUCATION

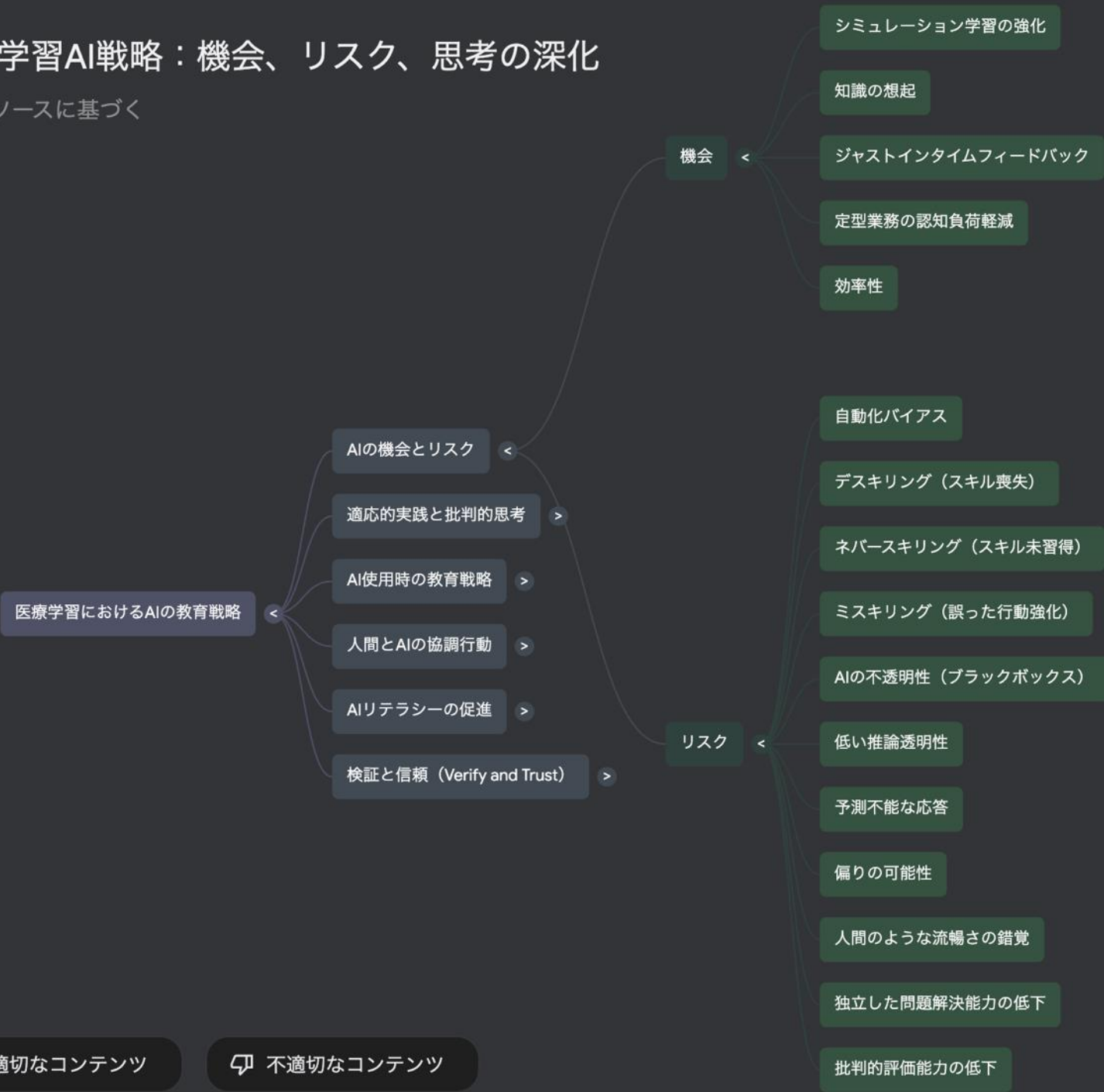
Educational Strategies for Clinical Supervision of Artificial Intelligence Use

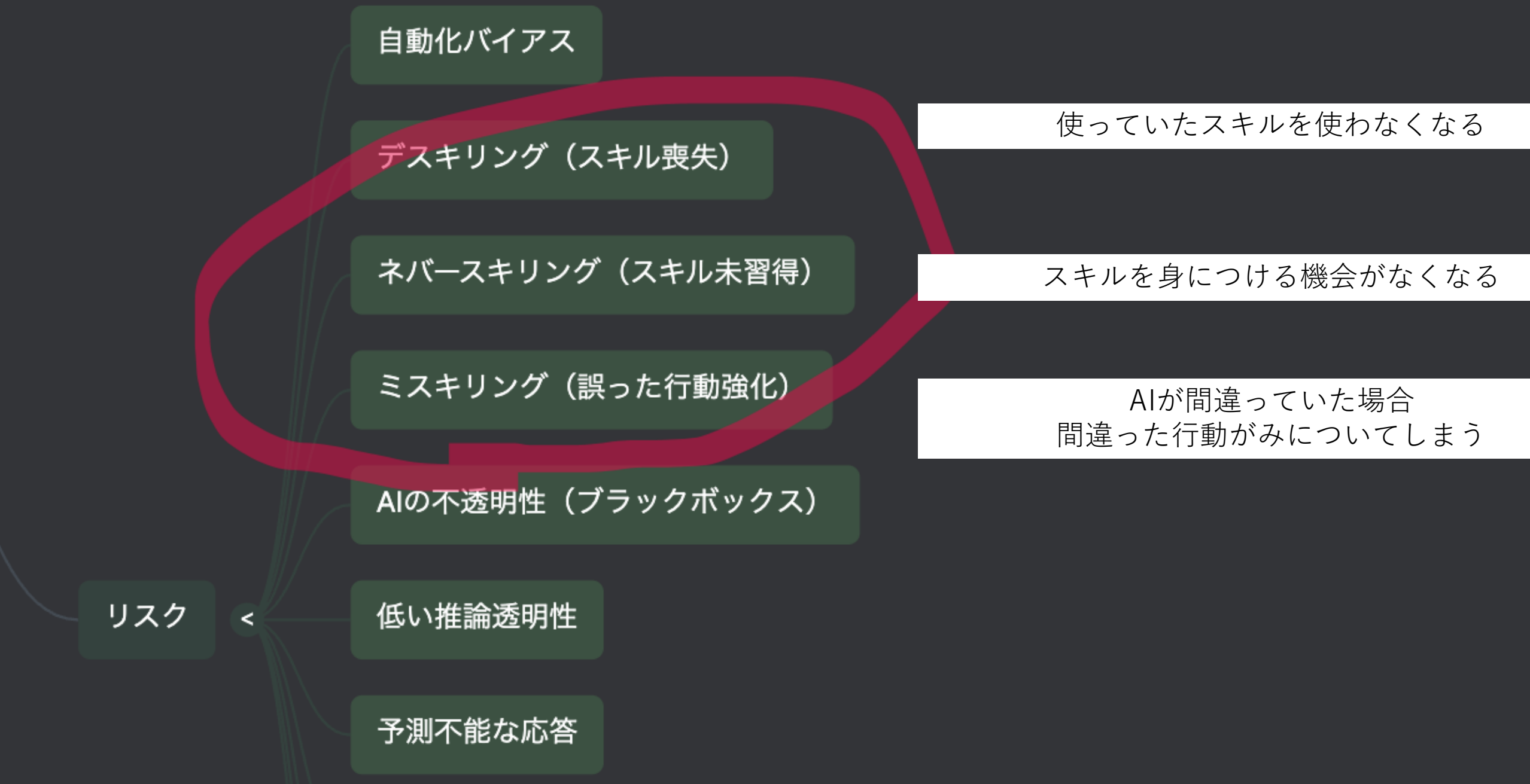
Raja-Elie E. Abdulnour, M.D.,¹ Brian Gin, M.D., Ph.D.,²
and Christy K. Boscardin, Ph.D.^{3,4}

1日先をこされた！

医療学習AI戦略：機会、リスク、思考の深化

1 件のソースに基づく





AIと医学教育で大切なこと

検証と実践

クリティカル・シンキング

DEFT-AI

構造化されたクリティカル・シンキングの指導
対話を通じて深めていく

WHAT MIGHT BE CAUSING MR C'S
SYMPTOMS? LET ME ASK CHATGPT...

THE RESIDENT IS PROBABLY USING
THE PHONE'S AI. NOW WHAT?
WHAT PROMPTS DID THE RESIDENT
PROVIDE THE AI?

IS THE RESIDENT QUESTIONING
THE AI OR ACCEPTING ITS
SUGGESTIONS AS IS?

CAN THIS AI BE ENTRUSTED
WITH CLINICAL REASONING?
HOW SHOULD I INTERVENE?

I have witnessed an AI interaction

I must promote critical thinking in
clinical reasoning and the use of AI:
DEFT-AI

Discussion, Evidence, Feedback, Teaching,
and recommendation for AI engagement

Figure 1. An Educator Witnessing a Learner's Use of Artificial Intelligence (AI).

An educator, acting as a clinical preceptor, observes a resident who is using a large language model chatbot to assist with a differential diagnosis. The educator recognizes the inherent challenge of trusting an AI tool that may not be fully reliable. This moment of AI interaction prompts the educator to intervene in what could be a high-risk scenario for both the learner and the patient. By stepping in, the educator creates an opportunity to make critical thinking a scaffold and to foster deeper engagement with clinical reasoning and the responsible use of AI — an approach encapsulated in DEFT-AI (diagnosis, evidence, feedback, teaching, and recommendation for AI use).



DEFT-AI

構造化されたクリティカル・シンキングの指導
対話を通じて深めていく

WITH CLINICAL REASONING?
HOW SHOULD I INTERVENE?

I have witnessed an AI interaction

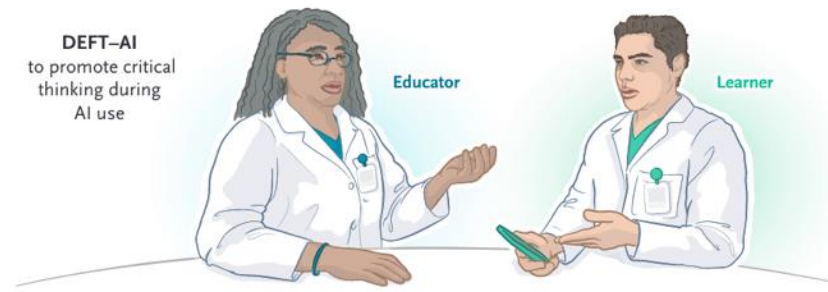
I must promote critical thinking in
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DEFT-AI

Discussion, Evidence, Feedback, Teaching,
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ner's Use of Artificial Intelligence (AI).

or, observes a resident who is using a large language model chatbot to assist with a differential
inherent challenge of trusting an AI tool that may not be fully reliable. This moment of AI in-
vene in what could be a high-risk scenario for both the learner and the patient. By stepping

DEFT-AI
to promote critical
thinking during
AI use



Diagnosis, Discussion, and Discourse

The educator asks for a description of the learner's specific use of AI.

What specific AI did you use?

I used the free version of ChatGPT on my phone.

How did you use AI in this process?

I just typed in, "What is the differential diagnosis for wheezing?"

What prompts did you enter in the app?

I asked it for the best diagnostic test and treatment strategy.

Evidence

The educator asks for an evaluation of the learner's evidence-based use of AI

How did you verify the AI-generated outputs?

Hmm. I didn't. The answers seemed reasonable to me.

Is the AI that you used shown to be accurate and safe?

Yes. I keep seeing social media posts about how great it is at making diagnoses.

Feedback

The educator asks the learner to reflect on growth opportunities in the use of AI.

How do you evaluate your own use of AI in this case?

I think I've become quite familiar at using ChatGPT. I use it all the time now.

How can you improve your use of AI?

I can't wait for an AI that can interpret ECGs and chest radiographs. I should verify the AI outputs next time.

Teaching

The educator provides focused teaching points based on findings from the conversation and recommends whether, when, and how to use AI safely moving forward.

Use AI tools that are known to be effective. Look for peer-reviewed evidence of their accuracy and safety. Our institution may have adapted and validated a similar model on the basis of high-quality data.

Prompting a chatbot is critical to generate valuable and accurate outputs. **Think of it as talking with a consultant:** provide enough specific information about the **Who** (the intended role of the AI and your role), the **Where** (description of the context), and the **What** (your goal and specific task or question). Always ask the AI to **explain its reasoning**, which improves its answers and lets you assess how it is thinking and how much to trust it. **One prompt is not enough:** have a conversation and give it feedback. Just like I did with you, you can also **ask it to engage in self-reflection and look for errors**.

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Recommendation for AI engagement

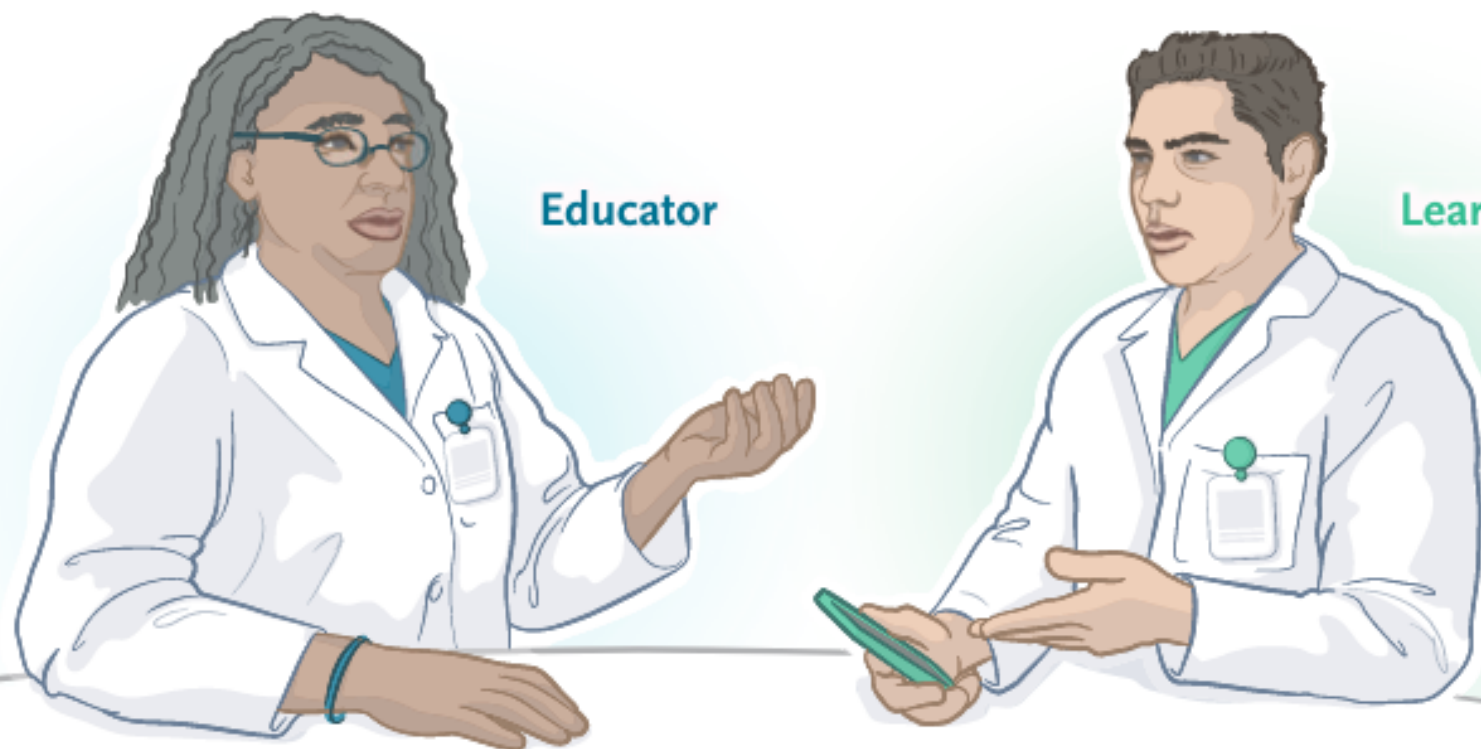
The educator provides learner-specific recommendations for the safe use of AI.

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DEFT-AI
to promote critical
thinking during
AI use

Educator

Learner



Diagnosis, Discussion, and Discourse

The educator asks for a description of the learner's specific use of AI.

What specific AI did you use?

I used the free version of ChatGPT on my phone.

How did you use AI in this process?

I just typed in, "What is the differential diagnosis for wheezing?"

What prompts did you enter in the app?

I asked it for the best diagnostic test and treatment strategy.

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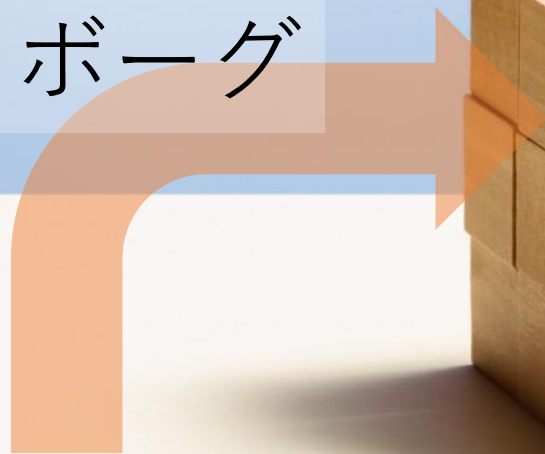
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<p>DEFT-AI to promote critical thinking during AI use</p> 	
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あれ、今日やったことでは？

モード

ケンタウロス⇔サイボーグ



実臨床は立体



AIは点

AI時代の医学教育について

ポイント	
機会とリスク	AIは学習機会を広げる一方で「技能低下（deskilling）」「未習得（never-skilling）」「誤った技能習得（mis-skilling）」のリスクあり
指導者の役割	指導医は学習者より経験不足のことも → 共に学ぶ姿勢が大切
実践の基本	効率と革新の間を行き来できる柔軟性 + 批判的思考の育成
注意点	AIの出力を鵜呑みにせず、立ち止まって考える習慣が必要
教育のフレームワーク	DEFT-AI （診断・根拠・フィードバック・教育・推奨）でAIリテラシー向上
活用スタイル	サイボーグモード （密接な協働）と ケンタウロスモード （役割分担）を状況に応じて使い分け

まとめ

- 高齢者診療は「臓器別の教科書通り」では動かない
- **オンセット × フォーカス**でまず整理する
- 適応的实践とクリティカル・シンキングで使ってみよう！

AIをうまく使いながら、
時間軸・トレンドを加味した全人的判断を！