

# Deadly Errors in Patients with Headache

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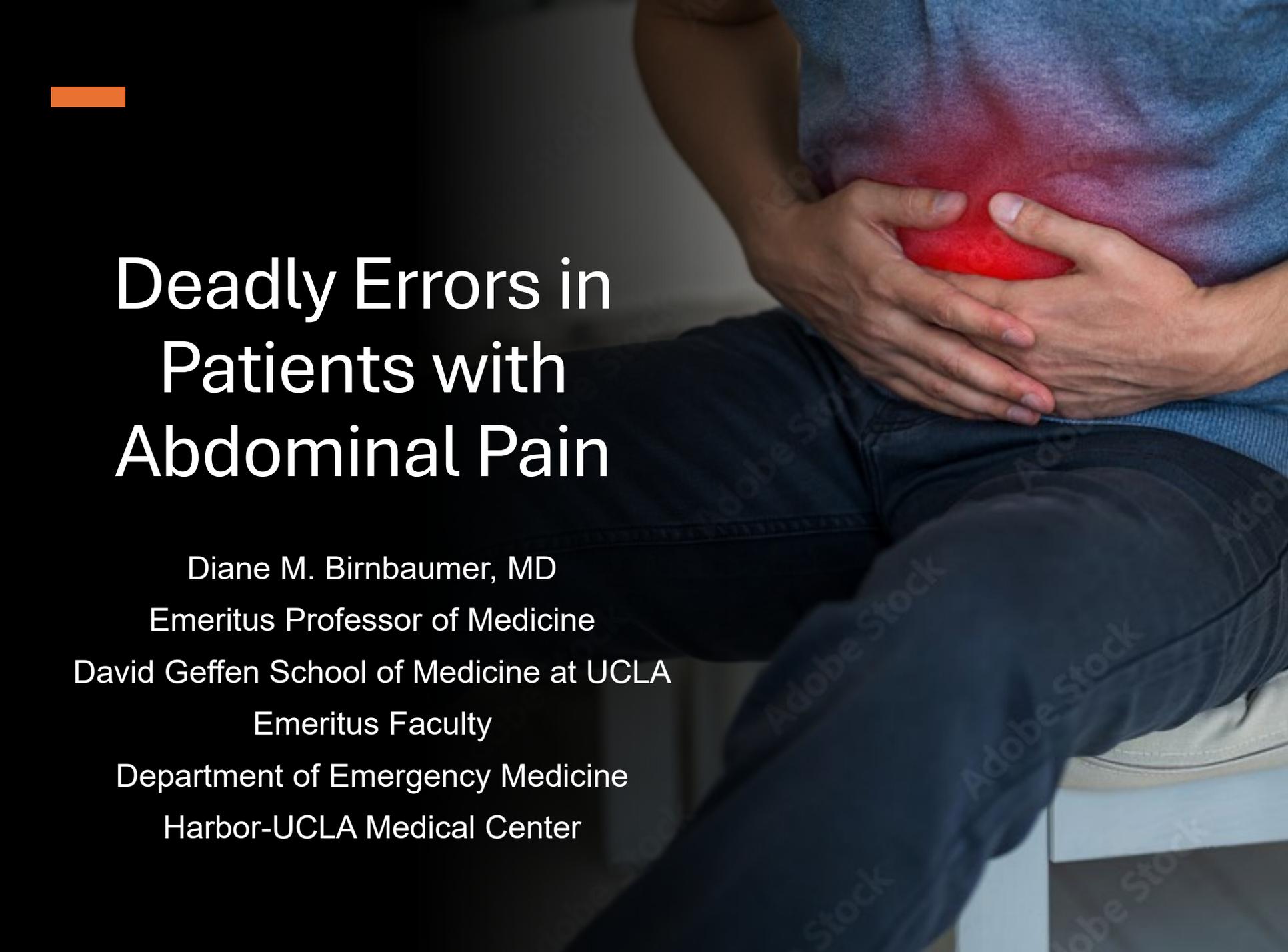
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Deadly Errors in  
Patients with  
Abdominal Pain

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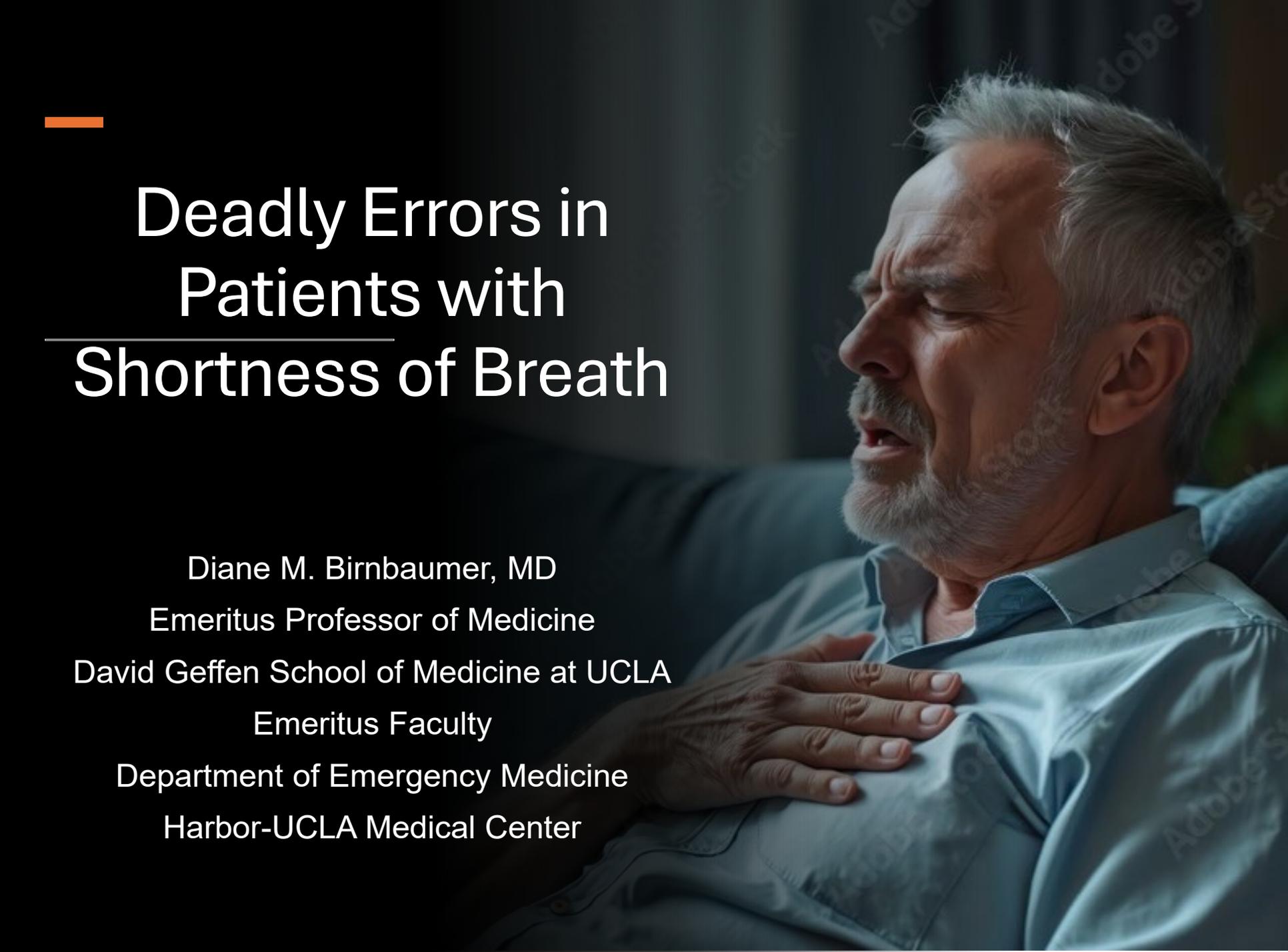
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# Deadly Errors in Patients with Shortness of Breath

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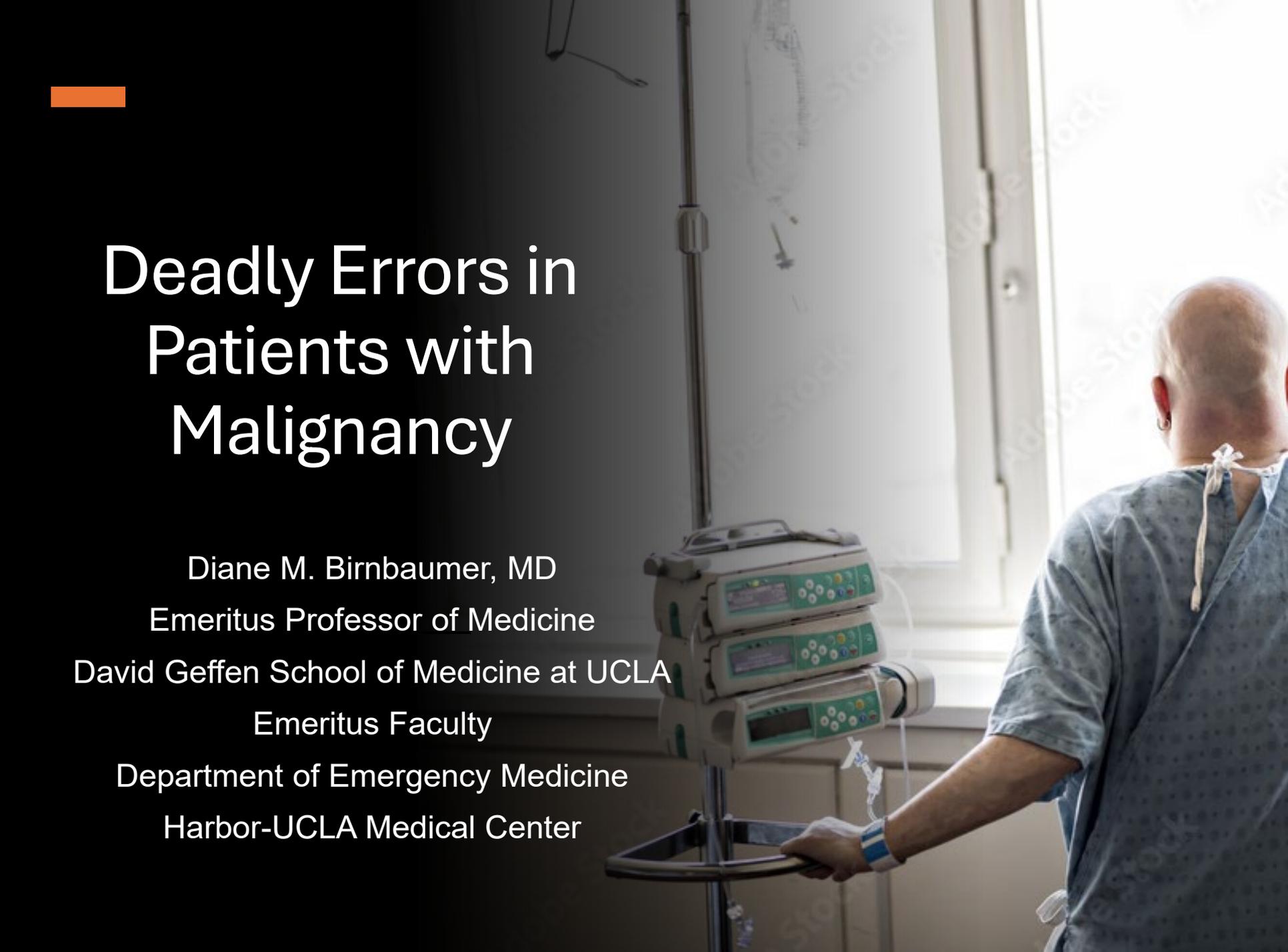
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A healthcare professional in blue scrubs is seen from behind, pushing a gurney with medical equipment in a hospital room. The gurney has three monitors and a control panel. The professional is wearing a blue and white striped wristband. The room has a window in the background, and the overall lighting is soft and clinical.

# Deadly Errors in Patients with Malignancy

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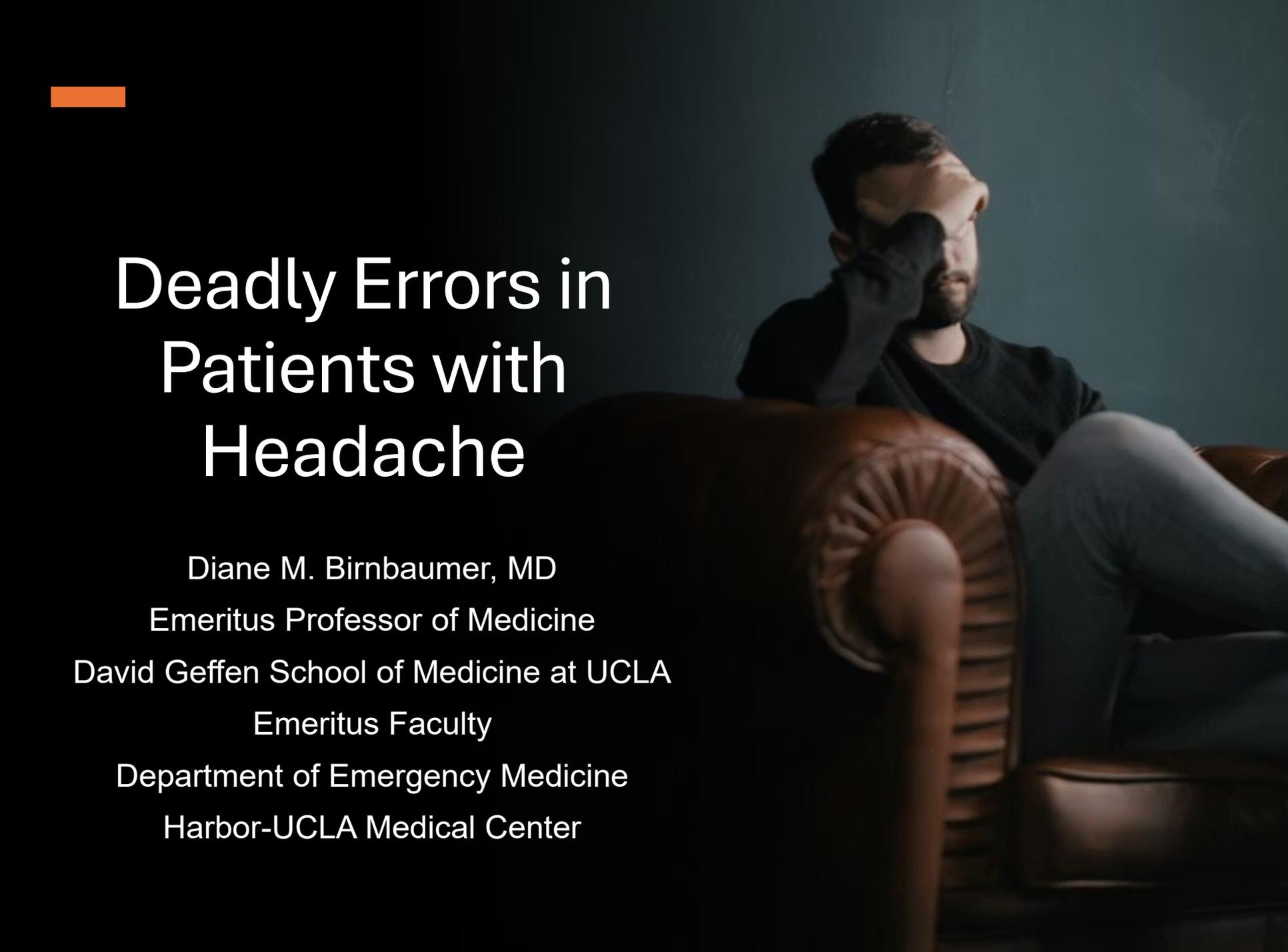
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**WRONG  
WAY**



# Deadly Errors in Patients with Headache

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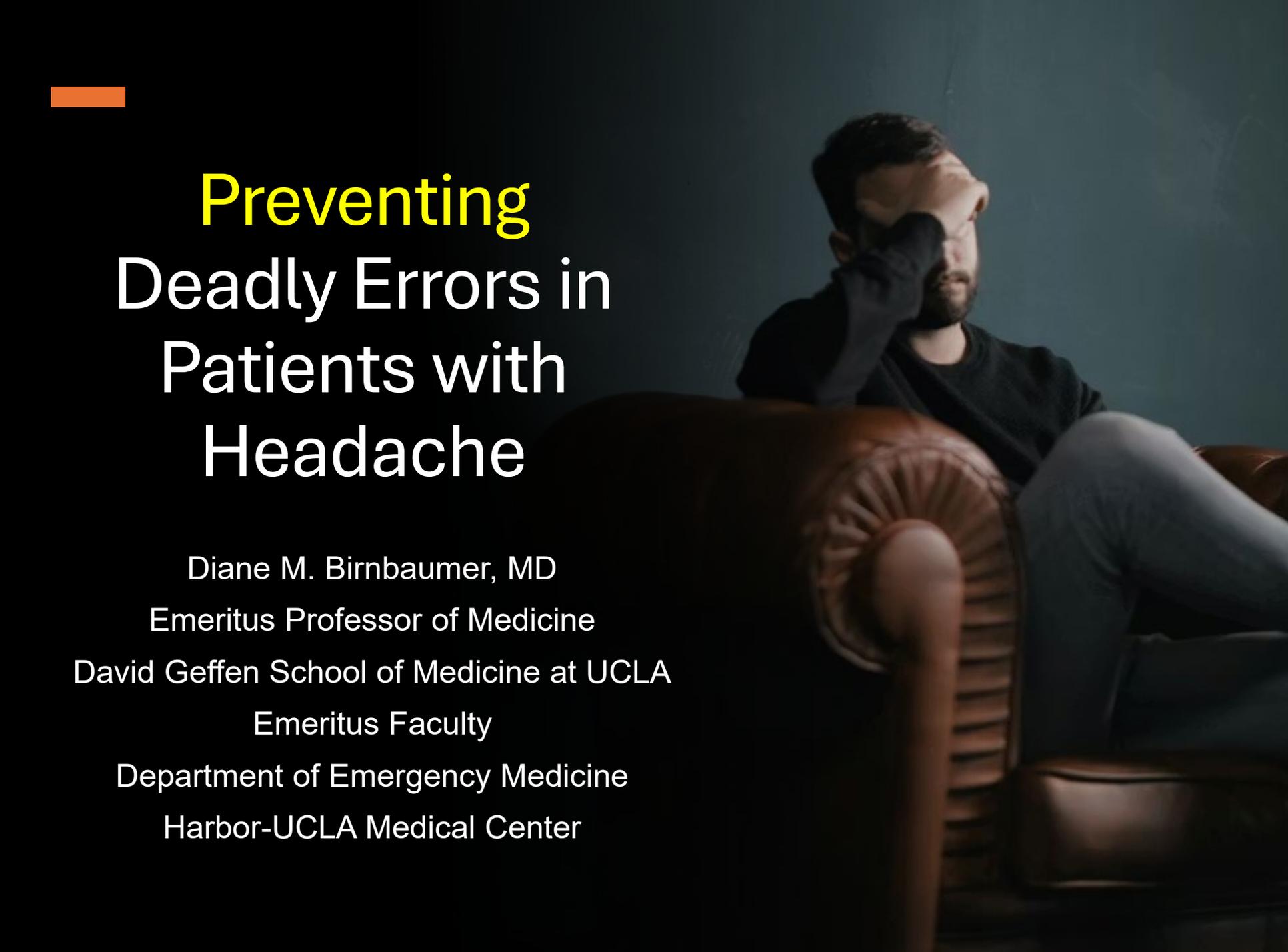
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Preventing  
Deadly Errors in  
Patients with  
Headache

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SEEK  
FIRST TO  
UNDERSTAND





Comparative Effectiveness Review  
Number 258

## Diagnostic Errors in the Emergency Department: A Systematic Review

- 2022 AHQR Report
- Lots of problems with the design of the study, but, after number crunching, they say...
  - 5% of patients – incorrect diagnosis
  - Some of these had an adverse event (0.3%)
  - Number crunching...
    - 1 in 18 – incorrect diagnosis
    - 1 in 50 – adverse event
    - 1 in 350 – permanent disability or death (370,000)
  - They note – rates are similar in primary care and hospital inpatient care



**AHRQ**  
Agency for Healthcare  
Research and Quality



Comparative Effectiveness Review  
Number 258

## Diagnostic Errors in the Emergency Department: A Systematic Review

- Arguably, this is the more important info from the study...
- **Top 5 riskiest medical conditions**, in order (account for 39% of serious misdiagnoses/harms):
  - **Stroke**
    - Missed 17% of the time\*
  - **Myocardial infarction**
  - **Aortic disasters (aneurysm / dissection)**
  - **Spinal cord issues (compression / injury)**
  - **Venous thromboembolism**



Comparative Effectiveness Review  
Number 258

## Diagnostic Errors in the Emergency Department: A Systematic Review

- Why are there so many “misses?”
  - Some conditions are **uncommon**
  - Many of the misdiagnoses were because **nonspecific or atypical symptoms** increased the likelihood for error



Comparative Effectiveness Review  
Number 258

## Diagnostic Errors in the Emergency Department: A Systematic Review

- Are there any “root causes” for these “mistakes”?
  - Failure to perform clinical assessment
  - Inadequate differential diagnosis
  - Failure of diagnostic reasoning
  - Failure in medical decision making
  - Most were cognitive (thinking) errors
  - Can we find a way to do this better?

How can  
we make a  
better  
differential  
diagnosis?



S

- What is the most **SERIOUS** thing this could be?

P

- What is the most **PROBABLE** thing this is?

I

- What is the most **INTERESTING** thing this could be, or...
- Could this be an **atypical or uncommon presentation of a common condition**?

T

- Are there any **TREATMENTS** needed right now,
- And what **TESTS** do I need to order?

S

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- Are there any **TREATMENTS** needed right now,
- And what **TESTS** do I need to order?



## Minimize The Risk

High risk patients / complaints / situations  
What are the “can’t miss” diagnoses?  
What shouldn’t we be fooled by?

Wait!

One more

thing!

WHAT

IF

?

!





Take a cognitive pause...



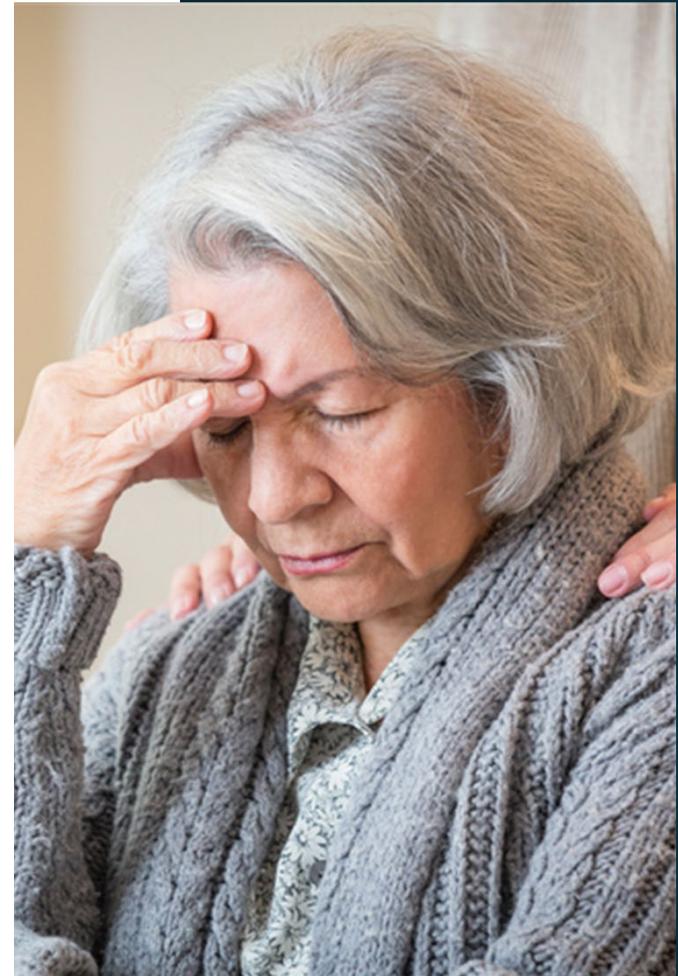
This lecture only  
works if you  
participate... so its  
success is on you!



**DISCLAIMER**

# What Are The “Can’t Miss” Diagnoses

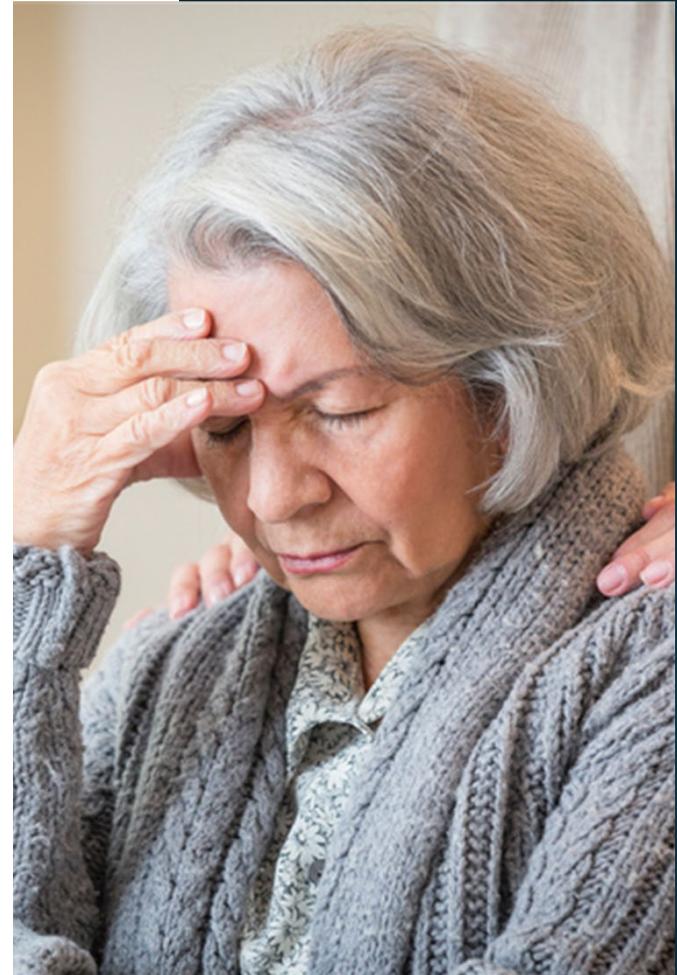
- Subarachnoid hemorrhage\*
- Meningitis / encephalitis\*
- Cerebral venous sinus thrombosis\*
- Stroke\*
- Intracranial mass / increased ICP
- Giant cell arteritis (>50 yrs)
- Preeclampsia / hypertensive emergency
- Acute angle-closure glaucoma
- Carbon monoxide poisoning
- Carotid or vertebrbasilar dissection
  
- If you did not consider it, you cannot exclude it (remember to SPIT)



# What Must You Ask About (and Document)?

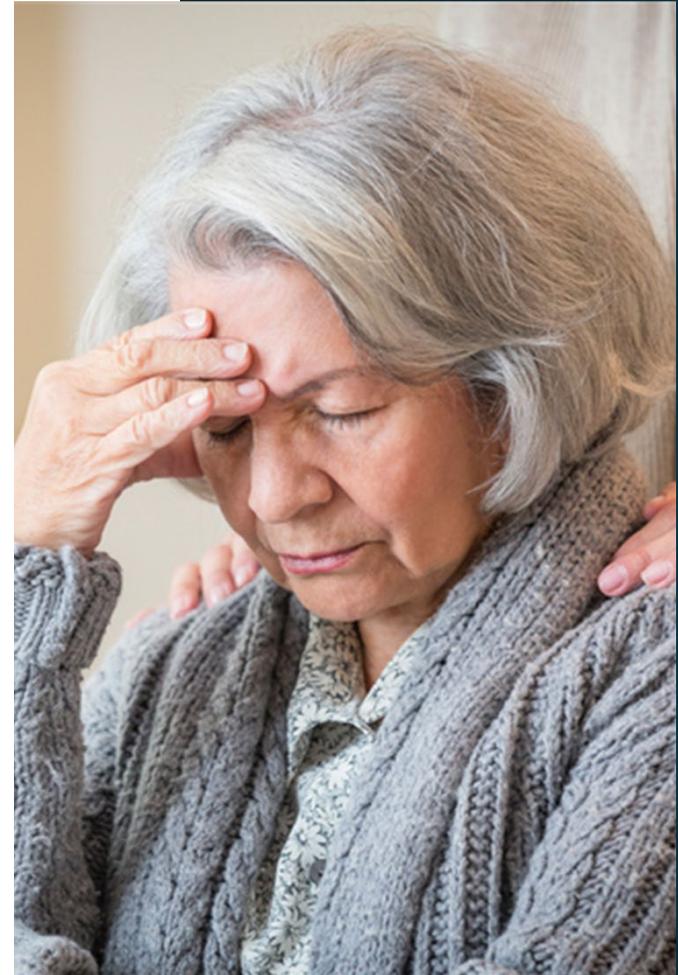
- HPI

- Abrupt onset headache
- Severe at onset
- Headache with fever
- Headache with neurologic symptoms or signs
- New headache in someone over age 50
- Headache with exertion, sex or Valsalva
- Progressively worsening headache
- Positional headache (worse with lying down)
- Pregnancy or post-partum
- Head trauma
- Neck manipulation or trauma (even minor)
- Recent infection (esp. HEENT)
- Others sick with similar symptoms (ask about CO exposures risk)



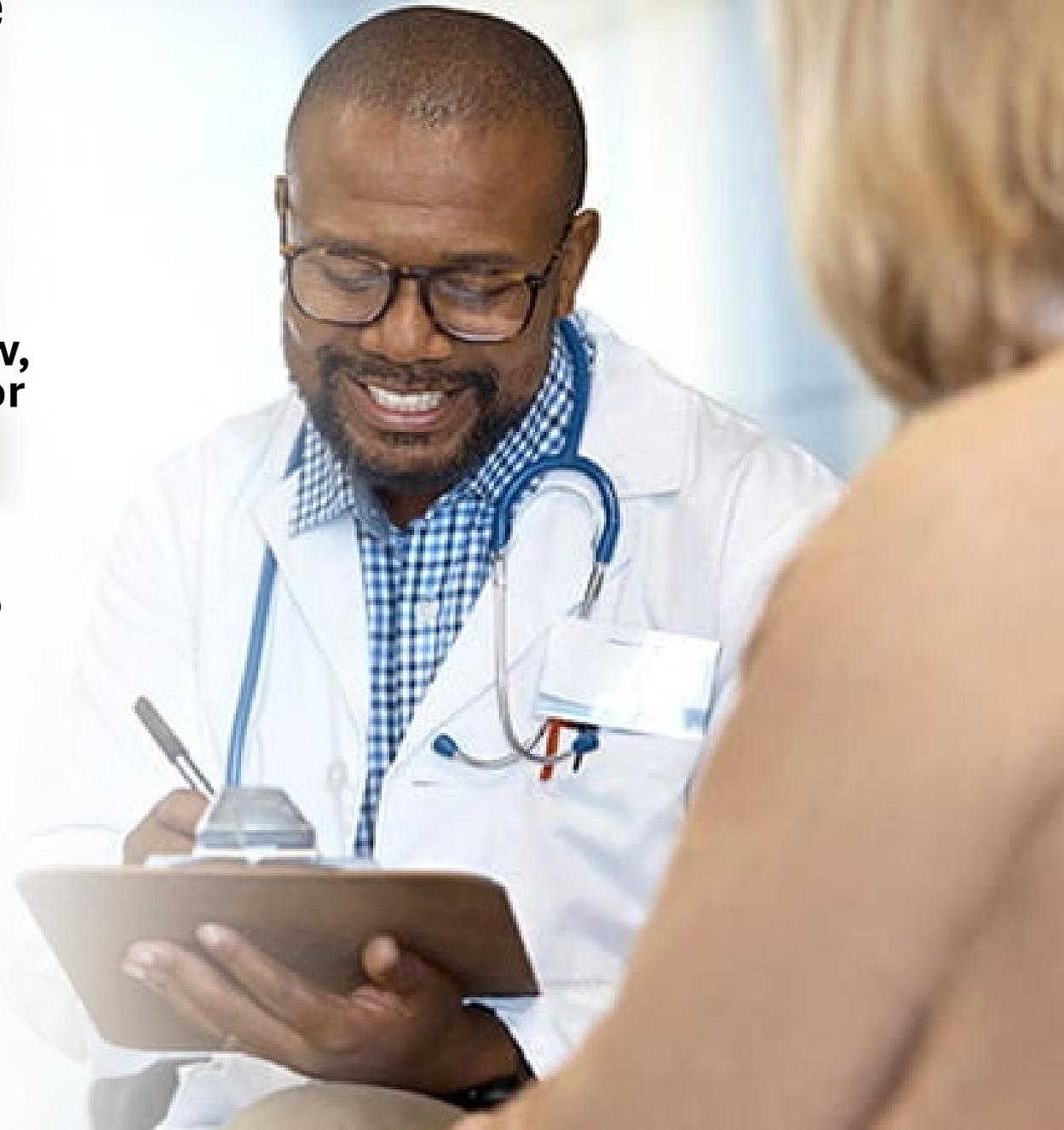
# What Must You Ask About (and Document)?

- PMH / Meds
  - History of cancer, immunocompromise, transplants
  - Anticoagulant use
  - Hypercoagulable state
- FH
  - Hypercoagulable state
  - Aneurysm



# Headaches Are Common, So Specifically Consider...

- Is this headache **new, different, sudden, or progressive?**
- Am I labeling this “benign” too early?
- If this patient had **no migraine history**, would I be more concerned?
- If ANY doubt → escalate evaluation



# Did You Find...?

- Thunderclap onset (seconds–minutes to peak)
- Worst headache of life
- Age >50 with new headache
- Fever or systemic symptoms
- Neck stiffness
- Altered mental status
- Syncope at onset
- Focal neurologic deficit
- New seizure
- Visual changes
- Pregnancy or  $\leq 6$  weeks postpartum
- Cancer or immunocompromised
- Anticoagulation
- Recent head or neck trauma

If ANY positive  $\rightarrow$  treat as dangerous until ruled out

# DON'T GET FOOLED

- Normal CT does NOT fully exclude SH (consider LP or CTA)
  - And ask about neck manipulation or injuries
- Normal CT does NOT exclude CVST (consider CTV/MRV)
- Normal ESR does NOT exclude early GCA
- No fever does NOT exclude meningitis
- Migraine history does NOT exclude new pathology



Don't  
Click

## Before Discharge

- Full neurologic exam documented
- **Visual acuity checked**
- Fundoscopy attempted (papilledema?)
- Blood pressure reviewed
- **Temporal arteries palpated if >50**
- Meningeal signs assessed
- **Patient asked about possible carbon monoxide exposure**



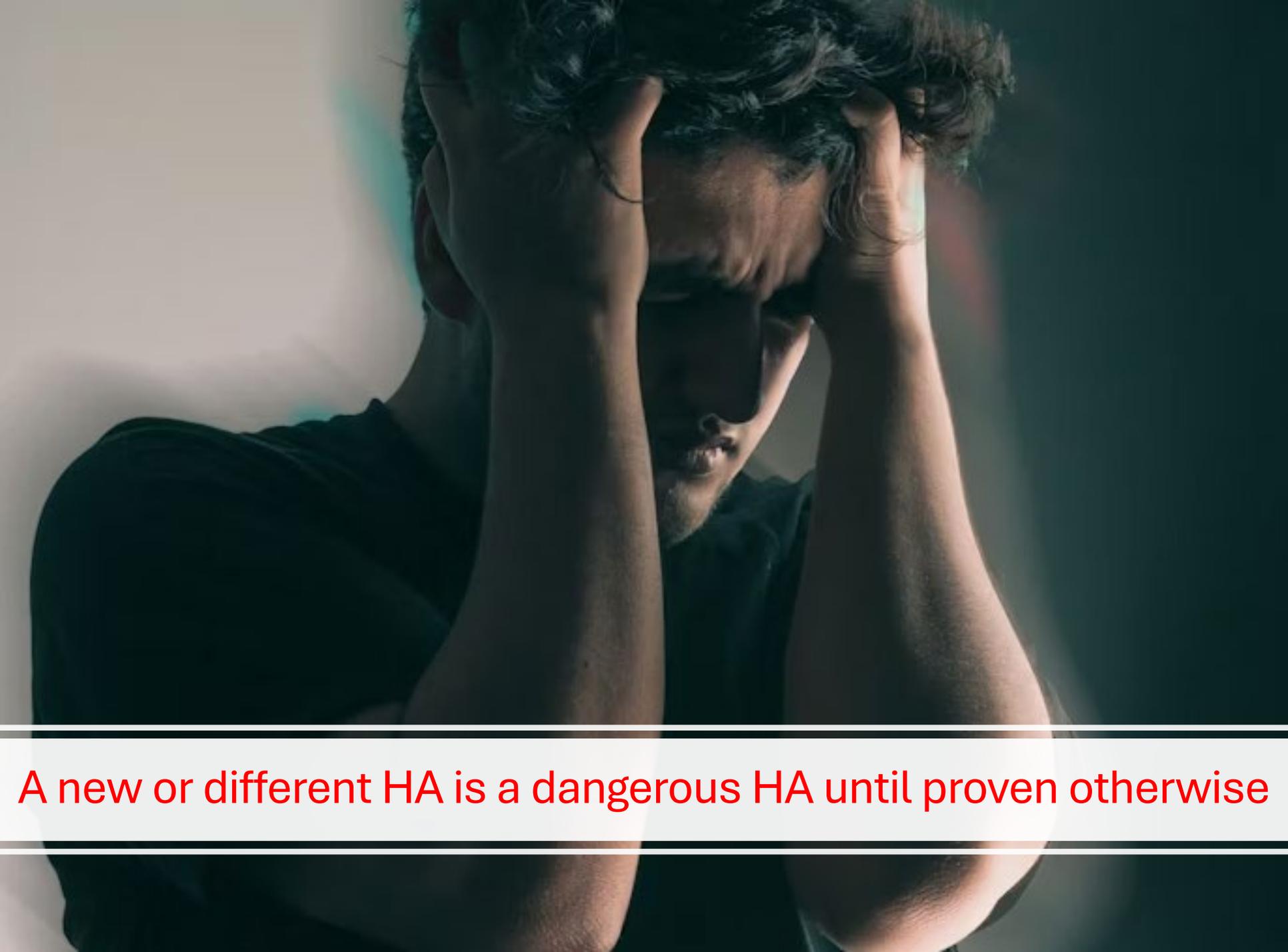
Take a cognitive pause...

# ASK YOURSELF

- Am I anchoring on migraine or another benign cause?
- Am I reassured by one normal test?
- Would I admit this patient if they were 70 instead of 30?
- And the final question to ponder...

— “If the patient gets sicker or dies within the next 24 hours, what diagnosis will I wish I had ruled out?”





A new or different HA is a dangerous HA until proven otherwise



“I have a terrible headache...”

# “I have a terrible headache”

37-year-old male with no past medical history comes to the emergency department complaining of a severe headache for the last 4 hours.

Began suddenly, severe within an hour. Nausea, no vomiting. No neurologic complaints or vision changes. Didn't take anything for pain; requesting pain meds.

Vitals normal except HR 110. Exam benign.

What do you think is wrong?

What do you do now?



“I have a terrible  
headache”

Someone at triage ordered an oral hydromorphone/acetaminophen pill for pain and the patient states he feels better and would like to go home now. He hasn't had any studies yet.

What do you tell this patient?



“I have a terrible  
headache”

The patient’s non-contrast head CT is  
normal.

What do you do now?



“I have a terrible  
headache”

What if...

The patient’s headache started  
yesterday?



# “I have a terrible headache”

The patient’s CTA of the head is negative.

Are you finished?



Pearl: Ask about possible neck injuries/strain. Carotid artery and vertebral artery dissections can present in a very similar fashion.



“I have a terrible  
headache”

What if...

The patient mentions that his wife and  
6-year-old son also have headaches  
and are home with the flu.



“I have a terrible  
headache”

What if...

The patient were an otherwise healthy  
68-year-old woman with no other  
complaints except fatigue?



# “I have a terrible headache”

What if...

The patient were an otherwise healthy 68-year-old woman with no other complaints except fatigue?

Need to consider: Stroke, ICH, temporal arteritis, intracranial mass, migraine, tension headache



“I have a  
headache...”

What if...

The patient were a 29-year-old first-  
time mother with a 3-week-old?

SPIT a differential diagnosis...



“I have a  
headache...”

**SPIT Differential Diagnosis**

**Serious:** Preclampsia, cerebral venous sinus thrombosis, SAH, PRES

**Probable:** Tension HA, migraine, post-dural puncture HA (if had epidural)

**Interesting:** Reversible cerebral vasoconstriction syndrome, pituitary apoplexy

**Tests/treatments:** Treat her pain, order tests to evaluate for possible diagnoses above



- Remember the rare life threats
  - Carbon monoxide (exposure, others also sick, “flu” with headache)
  - Carotid artery or vertebrobasilar dissection (ask about neck trauma, even minor)
  - Central venous sinus thrombosis
- Remember high-risk populations
  - Elderly
  - Post-partum

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Final Headache Pearls

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**Thank  
You**





“I have a headache. I’m sure I just need some sleep.”



**Cerebral Venous Sinus Thrombosis (CTV/MRV)**





SAH – no more pain, pain gone after migraine meds