



**CNS Alphabet Soup:  
CVA, ICH, SAH**


*Patient Case Presentations,  
ED Diagnosis and Management*

CNS Panel 



**New York ACEP  
Scientific Assembly**

*Lake George, NY  
July 5-7, 2006*

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**Thank you to AstraZeneca  
for their support of this  
educational session**

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**Panelists**

- Andy Jagoda, MD, FACEP  
Mount Sinai School of Medicine
- Daniel Labovitz MD, MS  
New York University School of Medicine
- Peter L. Shearer, MD, FACEP  
Mount Sinai School of Medicine
- Edward P. Sloan, MD, MPH, FACEP  
University of Illinois at Chicago

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**Disclosures**

- Andy Jagoda, MD
  - AstraZeneca, FERNE
- Daniel Labovitz MD, MS
  - None
- Peter L. Shearer, MD, FACEP
  - None
- Edward P. Sloan, MD, MPH
  - FERNE

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**Global Objectives**

- Improve ED neuro patient care
- Minimize morbidity and mortality
- Expedite disposition
- Optimize resource utilization
- Enhance our job satisfaction

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## Session Activities

- Present relevant clinical cases
- Poll the audience about care
- Discuss the questions
- Understand areas of consensus
- Explore areas of uncertainty
- Go forth and prosper

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## Headache and SAH

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## Case Presentation

- 38 year-old female complains of the “worst headache of her life” x 4 hours
- Diffuse head pain, some nausea
- No relief with Tylenol
- No ENT sx, no neck pain
- No sudden onset, no fever
- Hx headaches in the past, Migraine Hx?
- Hx prior CT, years ago, negative

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## Case Presentation

- VS 158/70 RR 18 P 96 Temp 98.6
- Prefers to lie quiet with eyes closed
- ENT normal
- Pupils OK, mild photophobia?
- No meningismus
- Cardiopulmonary exam OK
- Mental Status OK
- Neurological Exam
  - Awake and alert, MS OK
  - No focal weakness, sensory LT OK
  - Speech, vision, gait OK

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## Question: Cephalgia

- What is your assessment of SAH risk in headache patients?

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## Question: Cephalgia

- A. I consider “worst headache of life” presentations such as this patient to be consistent with SAH, requiring complete evaluation

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### Question: Cephalgia

- B. I only consider thunderclap headache to be significant for SAH risk, even if patients state a worst headache

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### Question: Cephalgia

- C. I do not strongly rely on the description of the headache, instead relying on the physical exam at the time of the patient presentation.

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### Question: Cephalgia

- D. I rely primarily on the cranial CT for my true assessment of SAH risk.

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### Question: Cephalgia

- A. Worst headache signifies SAH
- B. Thunderclap headaches means SAH
- C. Description less important, physical exam at presentation most important
- D. I primarily rely on CT.

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### Question: CT & SAH

- Regarding the diagnostic accuracy of cranial CT in excluding SAH, I believe the following:

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### Question: CT & SAH

- A. CT, even new generation scanners, cannot exclude SAH, requiring LP in all at risk patients

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### Question: CT & SAH

- B. I believe that CT can exclude SAH, but I still tend to LP all at risk patients

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### Question: CT & SAH

- C. I believe that new generation scanners can exclude SAH with adequate sensitivity such that LP is not indicated with a negative CT unless the headache patient is at high risk for SAH

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### Question: CT & SAH

- D. If I still consider SAH after a negative CT, I consider other tests such as CTA, and do not always perform an LP.

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### Question: CT & SAH

- A. CT doesn't exclude SAH, LP risk pts
- B. CT excludes SAH, but I LP anyways
- C. New generation CT excludes SAH
- D. When in doubt, I perform CTA or other CNS vessel test.

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### Question: CT, LP Negative

- My approach to moderate risk headache pts when the CT and LP are negative and the symptoms have resolved is as follows:

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### Question: CT, LP Negative

- A. If both are negative, I discharge home if symptoms resolve because SAH risk is minimal after testing.

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**Question: CT, LP Negative**

- B.** Further workup is required, even if both tests are negative. I arrange for a MRA, CTA or angiogram from the ED

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**Question: CT, LP Negative**

- C.** Further work-up is required, and I admit to neurology for this to be done

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**Question: CT, LP Negative**

- D.** I do whatever the PMD or neurology consultant requests for this patient

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**Question: CT, LP Negative**

- A.** Discharge home as able
- B.** Further work-up in the ED
- C.** Admit for further work-up
- D.** Do whatever consultant, PMD want

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**Question: Traumatic Tap**

- An LP is performed, with 10,000 RBCs in tube 1 and 5,500 RBCs in tube 4. Your interpretation of this CSF is as follows:

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**Question: Traumatic Tap**

- A.** This is clearly evidence of a SAH because of the large number of RBCs noted in tubes 1 and 4, even if moderate clearing of RBCs occurs in tube 4.

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### Question: Traumatic Tap

**B.** This is a confusing LP, and a repeat LP or some other CNS vessel test (MRI, MRA, angiogram) should be performed now.

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### Question: Traumatic Tap

**C.** Because there is nearly 50% clearing by tube 4, and because the overall number of RBCs is relatively low, this is likely a traumatic tap. I would do no other testing to exclude SAH.

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### Question: Traumatic Tap

**D.** I would do a delayed LP in 12 hours in order to detect xanthochromia in order to guide further testing.

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### Question: Traumatic Tap

- A.** This clearly confirms a SAH
- B.** Repeat LP or other test now
- C.** This clearly is a traumatic tap
- D.** Delayed tap for xanthochromia

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### Question: Sx Resolution

- Regarding symptom resolution in cephalgia patients with suspected SAH, I believe the following:

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### Question: Sx Resolution

- A.** Symptom resolution suggests to me that a SAH is highly unlikely.

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### Question: Sx Resolution

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**B.** Symptom resolution only signifies low risk for SAH if I have not used narcotics to cause the symptoms to resolve.

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### Question: Sx Resolution

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**C.** Symptom resolution is unreliable for excluding significant pathologies such as SAH. As such, I disregard this clinical factor in determining diagnosis, treatment and disposition plan.

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### Question: Sx Resolution

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**D.** I rely heavily on my own clinical impression and patient physical exam in order to assess risk, not symptom resolution.

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### Question: Sx Resolution

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- A.** Headache resolution: low risk SAH
- B.** Low risk SAH only if no narcotics
- C.** Symptom resolution does not suggest a benign headache etiology
- D.** Rely on clinical impression, pt exam

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### Headache and SAH

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- Need to assess pre-test risk
- Assess post-test risk using:
  - Headache type, symptom onset
  - Clinical impression
  - Negative cranial CT
  - Symptom resolution
- Consider LP or other vessel test
- Document risk assessment using these clinical factors

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### Stroke and ICH

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**Question: Stroke and ICH**

- A stroke patient presents with an intracerebral hemorrhage of the left midbrain of 4 cm diameter associated with mild edema but no mass effect. What would be your management of this stroke patient?

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**Question: Stroke and ICH**

- A. I would transfer this patient to another hospital because I don't have neurosurgery coverage and/or it is our institution's protocol.

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**Question: Stroke and ICH**

- B. I would immediately admit this patient to neurosurgery for further orders.

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**Question: Stroke and ICH**

- C. I would be able to manage BP, ICP, the airway, and ICH complications in the ED prior to transfer or disposition to another service for admission.

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**Question: Stroke and ICH**

- D. Not only could I manage this patient, I am aware of published ICH management guidelines, and would follow these guidelines in managing this patient.

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**Question: Stroke and ICH**

- A. Transfer for neurosurgery care.
- B. Admit to neurosurgery.
- C. I can Rx pt prior to disposition.
- D. I know the published ICH guidelines and how to Rx.

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**Question: ICH and Clopidogrel**

- This midbrain 4 cm diameter ICH associated with mild edema but no mass effect occurs in a patient on clopidogrel. What would be your management of this stroke patient?

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**Question: ICH and Clopidogrel**

- A. Supportive care only
- B. Infuse prothrombin complex concentrate
- C. Infuse recombinant FVIIa
- D. Infuse DDAVP
- E. Transfuse platelets

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**Question: ICH and Warfarin**

- This 2 cm diameter ICH associated with edema and mass effect occurs in a patient on warfarin. The INR is 5.9. What would be your management of this stroke patient's elevated INR?

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**Question: ICH and Warfarin**

- A. Supportive care only
- B. Administer vitamin K only
- C. Infuse fresh frozen plasma
- D. Infuse prothrombin complex concentrate
- E. Infuse recombinant FVIIa

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**Question: tPA and ICH**

- An ischemic stroke patient is treated with tPA, and then is diagnosed because of deterioration in mental status as having an ICH. Your management would be as follows:

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**Question: tPA and ICH**

- A. Administer vitamin K only
- B. Infuse fresh frozen plasma
- D. Infuse prothrombin complex concentrate
- E. Infuse cryoprecipitate
- E. Infuse recombinant FVIIa

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## Stroke and ICH

- Many pts are on clotting modulators
- Specific scenarios will exist
- Treatments directed at restoring normal clotting function
- Guidelines may direct therapy
- New approaches developing

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## Conclusions

- Important disease states
- Many questions
- Many treatment options
- EM physicians play a lead role
- Guidelines direct therapies

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**Questions?  
Thank you!**

[ferne@ferne.org](mailto:ferne@ferne.org)  
[edsloan@uic.edu](mailto:edsloan@uic.edu)  
[www.ferne.org](http://www.ferne.org)

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9/27/2006 5:24 PM

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