CASE 3

A 15 YEAR-OLD GIRL WITH HEADACHE:
A GRANDMOTHER'S 9/11 STORY

America has had many defining moments throughout the years. For many, we remember exactly where we were and what we were doing. On the morning of September 11th, 2001, I was working an 8 AM–4 PM shift in the Emergency Department. The day started slow. After I had seen a few patients, I checked the news on the computer; the report just before 9 AM was that a small commuter plane had crashed into one of the buildings of the World Trade Center. Soon, we knew the whole story.

Deep thoughts:
1. Which historical factors are most important in the evaluation of headache?
2. Should we evaluate similar complaints differently when the patient presents per EMS?
3. How does the evaluation of headache differ in the pediatric population?
4. What role should “associated symptoms” play in the evaluation of a “chief complaint?”

PART 1—MEDICAL

1. The Patient’s Story

Peggy is a 15 year-old high school student, usually to bed by 7:30 so she can be up at 5AM for school. She does not smoke or drink. She is one of three sisters, but is separated from her siblings and her parents; the other two sisters live with their father, and her mother lives in Phoenix, Arizona.

Peggy’s home situation is unique; she lives with her grandmother, an engaged and caring person, founder of the Give the Children a Chance organization and host of Gospel Dimensions on WXYZ-FM. One of five grandchildren, Peggy has had some emotional issues, twice “cutting” herself, one time placing multiple parallel incisions on the left forearm and another time eight on the left shin.

On the afternoon of September 11, 2001, only hours after United 93 hits the ground in Stonycreek, Pennsylvania, Peggy begins to cough and develops a headache. Her grandmother tries to get her into the car to take her to the doctor, but is unable—at 2:15 PM Peggy’s grandmother dials 911.

At 2:20, the paramedics arrive to find Peggy sitting on the couch. They record: “Patient had a sudden onset of neck and head pain this am after coughing. Denies dizziness, nausea, vomiting, numbness/tingling of extremities. ABC intact. Is able to move her neck.”
Date: September 11, 2001 at 14:53  
Chief complaint: Headache  
Nurse’s note: Pt. c/o coughing and neck and head pains c/o stiff neck. Ears plugged – some nausea and vomiting of thin liquids. Pain scale 5/10

HISTORY OF PRESENT ILLNESS (Per physician assistant, Ms. Kelly McKinney): Patient complains of throbbing frontal headache(s) for a few hours prior to arrival. No n/v, blurred vision, photophobia, numbness, fever. Patient denies it is the worst headache ever. No trauma. Stated it started after a coughing spell. The condition has remained unchanged since onset. There has been no reported treatment prior to arrival.

REVIEW OF SYSTEMS: Unless otherwise stated in this report or unable to obtain because of the patient’s clinical or mental status as evidenced by the medical record, the patient’s positive and negative responses for constitutional, psych, eyes, ENT, cardiovascular, respiratory, gastrointestinal, neurological, genitourinary, musculoskeletal, integument systems and systems related to the current problem—are either stated in the preceding or were not pertinent or were negative for the symptoms and/or complaints related to the presenting medical problem.

PAST MEDICAL HISTORY:  
Allergies: NKDA  
Meds: None  
PMH: Asthma  
Soc Hx: Nonsmoker

The History of Present Illness, Review of Systems, and Past and Social History are complete to the best the patient or the patient’s representative was capable of reporting or could not be obtained because of the patient’s clinical or mental status as evidenced by the medical record.

EXAM:  

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CONSTITUTIONAL: Alert and well developed  
MENTAL STATUS/PSYCHIATRIC: Age-appropriately oriented to time, place, 3rd person. Affect appropriate for age.  
HEAD: Without temporal or scalp tenderness, masses, or lesions.  
EYES: PERRL, EOMI: No discharge or conjunctival injection.  
EARS: TMs without perforation, injection, or bulging. External canals clear without exudate.  
NOSE: Normal mucosa and septum.  
THROAT: Pharynx: without injection, exudate, or tonsillar hypertrophy. Airway patent.  
FACE: No tenderness or swelling.  
NECK: Supple. No tenderness. No lymphadenopathy.
LUNGS: Clear to auscultation and breath sounds equal.
HEART: RRR, nl heart sounds, without pathological murmurs, ectopy, gallops, or rubs.
NEUROLOGICAL: Cranial and cerebellar functions normal. Motor functions intact.

ED COURSE:
16:00 – Ibuprofen 600mg PO. Soft collar neck. Ice pack

DIAGNOSIS: Headache

DISPOSITION (16:39): Patient was discharged home by the ED physician. Return in 2–3 days if no better. Condition upon discharge [undocumented]. Rx for ibuprofen 600mg TID. Return to ER if symptoms change.

Kelly McKinney, PA-C
Bruce Hanninger, DO

III. The Errors—Risk Management/Patient Safety Issues

➢ Authors’ note: There is a Bob Dylan line that comes to mind, “I can’t help it if you might think I’m odd, if I say I’m not loving you for what you are, but what you’re not.” The documentation on this chart is quite good … as it reads. But is there more to this story?

Risk management/patient safety issue #1:
Error: Poorly defined onset of headache.
Discussion: When a patient presents with headache, fever, rash and confusion, my neighbor can make the diagnosis. The trick with headache is to find the life-threatening diagnosis lurking around the corner. Arguably the most important historical element in a headache patient is the onset.
Answers to the “onset question” can vary widely. Often, a patient will say the onset is sudden only to mean that it started over a period of a few hours. That may be “sudden” in relation to the time span of their life, but certainly not our definition of sudden; reaching maximum intensity in less than one minute.
✓ Teaching point: Every headache patient needs to have a clearly defined documentation of onset.

Risk management/patient safety issue #2:
Error: Inaccurate documentation.
Discussion: One of the most important aspects of the documentation is the general appearance of the patient. It is our Malcolm Gladwell’s “Blink” moment. It is our gestalt as we walk into the room; “sick or not sick?” The appearance is documented here, but in a very general and nonspecific manner: “Alert and well developed. Age-appropriately oriented to time, place, 3rd person. Affect appropriate for age.” To me, it sounds like it came from a computer pick-list.
Consider this exchange during the deposition of the plaintiff’s expert witness William Biggs by the plaintiff’s attorney, Louis Latiff:

Q. When a patient presents in severe pain, do they always provide 100% accurate information?
A. Sometimes a patient in severe pain is unable to give a history until you’ve treated their pain and have them feeling better.

Q. Is it fair to say that Mrs. Rainey’s (the grandmother) version of her interaction with Dr. Hanninger and Ms. McKinney (PA-C) is not entirely consistent with the [documentation provided]?
A. Yes.

Q. Is it fair to say that Mrs. Rainey’s version describes Peggy as having severe pain and at some point screaming?
A. Yes, sobbing.

Q. That’s not noted anywhere in the physician’s report, is it?
A. That’s correct.

Another interesting fact was unearthed during the trial; Peggy was examined while in the wheelchair. Her pain was so severe she was not able to even get on the cart.

✔ Teaching point: One of the most important parts of the documentation is describing if the patient appears sick or well.

Risk management/patient safety issue #3:
Error: Contradiction between the triage note and the doctor’s note.

Discussion: The triage note not only mentions vomiting, but describes the material Peggy vomited as “thin liquids.” The specific nature of the description makes it believable, compared to the doctor’s note which stated in the first ROS notation: “no nausea/vomiting.” If there is a discrepancy between the triage note and the doctor’s note, the more credible of the two wins, unless the physician addresses the discrepancy and declares the former inaccurate based on the findings.

✔ Teaching point: Just because your initials trump the nurse’s initials doesn’t mean your documentation automatically trumps theirs. Corny as it sounds, the providers should care for patients as a team.

Risk management/patient safety issue #4:
Error: No exploration of associated symptoms of vomiting and neck pain.

Discussion: The primary complaint recorded by the nurse was headache, but there were other symptoms mentioned in the triage note, which were not explored further. Could the patient have had primary neck pain which then radiated up into the head, perhaps from a carotid or vertebral artery dissection? How about meningitis? She was coughing. Could pneumonia have been present? PE? Spontaneous pneumothorax?

✔ Teaching point: One complaint per customer doesn’t fly in Emergency Medicine. When there is more than one complaint, they all need to be explored (remember Case 1?)
Risk management/patient safety issue #5:

Error: No progress note.

Discussion: This is challenging, but no less necessary, in a busy community ED. Who has the time to write a progress note on every patient? Additionally, when ankle inversion is the mechanism and the X-ray is negative, it is easy to intuit from the chart why the physician arrived at the diagnosis of “sprain.” But there are some patients who leave the ED with diagnostic uncertainty; Peggy was one.

The diagnosis recorded by the doctor was the same as the chief complaint, which is fine. But clearly, the exact cause of the headache was not defined. Writing a progress note will often force the physician to think through the decision-making process and differential diagnosis, often prompting them to re-check and re-examine the patient. If the progress note does not even convince you, it will definitely not convince a jury!

✔ Teaching point: Write a progress note on all high-risk patients.

Risk management/patient safety issue #6:

Error: Reassurance because this is not the “worst headache of her life.”

Discussion: I had a neurosurgeon see one of my patients in the ED a few years ago, commenting to me later that the patient didn’t have a headache with a “thunderclap” onset. Really? Get your head out of the textbook into the reality of ED headache presentations. What patient ever uses that terminology? If we sent home all chest pain patients not pointing to an elephant sitting on their chest, we would spend more time in court than at the bedside.

I personally never use the phrase “worst headache of life” and discourage the nurses from documenting it unless it is an unsolicited comment from the patient. After all, the first headache in your life is also the worst headache in your life (by definition). Besides, who would ever answer “no” to this question, particularly when the “questioner” is holding a syringe of Dilaudid and Phenergan?

What’s most important is the onset and whether or not the patient’s headache is unusual in any way. Reporting that the headache is the “worst of my life” is just one of many ways patients can relay to us that this headache is something unusual, unlike anything they have ever previously experienced. So, what makes a headache “unusual” enough to raise concern is the onset, intensity, new location, onset with exertion and certain associated signs or symptoms, such as syncope or neck pain, to name just a few.

Another curious note in regard to our patient; here is a 15 year-old girl, who does not suffer from frequent headaches, being transported to the ED on 9/11 by squad because her grandmother couldn’t even get her into the car. Here is a girl in such severe pain that she is examined in a wheelchair. Here is a girl screaming and sobbing in pain. And I ask this—how could this not be the worst headache of her life?

✔ Teaching point: Use caution when using catchphrases. Don’t expect patients to conform to a textbook description of their symptoms.
Risk management/patient safety issue #7:

Error: Gobbledygook! No. Not a medical term. But, nonetheless, I said "Gobbledygook!"

Discussion: Definition: unintelligible language, especially jargon or bureaucratese. We can trace its origins back to Maury Maverick, a man whose last name became synonymous with a politician who refuses to conform to the party line. (Though "mavericks" can change ...) The term "gobbledygook" first appeared in print in the New York Times Magazine on May 21, 1944, being inspired by the turkey, "always gobbledy gobbling and strutting with ludicrous pomposity."

So, let me again reproduce the documentation from Peggy's chart: "Unless otherwise stated in this report or unable to obtain because of the patient's clinical or mental status as evidenced by the medical record, the patient's positive and negative responses for constitutional, psychic, eyes, ENT, cardiovascular, respiratory, gastrointestinal, neurological, genitourinary, musculoskeletal, integument systems and systems related to the current problem—are either stated in the preceding or were not pertinent or were negative for the symptoms and/or complaints related to the presenting medical problem." If anyone knows what this means, please write. If anyone thinks this protects you from a legal standpoint, please don't!

✔ Teaching point: Sometimes gobbledygook is just gobbledygook.

➤ Authors' note: Summary/question: When there is a poor outcome, does it help to have documented, "Patient denies it is the worst headache ever?"

IV. The Bounceback

September 15, 2001—(PCP visit—four days after initial ED visit) Peggy goes to see her primary care physician. Her complaint is neck pain. He takes a history and examines the patient, prescribes flexeril for her neck pain and sends her home to return if worse. It is unclear whether the doctor knows she had recently been to the ED with a headache.

October 7, 2001—The country wakes to the following headline: U.S. Strikes Afghanistan
In a press conference, President George W. Bush said the United States and its allies launched an attack Sunday night on targets in Afghanistan to retaliate for the September 11 attacks on New York and Washington.

The battle is now joined on many fronts," Mr. Bush said. U.S. and British forces have taken "targeted actions" against Mr. bin Laden's terrorist network and against the military command of the Taliban militia.

October 8, 2001—Peggy is not up for school. At 5:10 AM her grandmother goes to her room to see if she is awake and finds her unresponsive. The paramedics are called. There is no attempt at resuscitation. Peggy is pronounced dead.

October 9, 2001—As published in The Abductor (collection of two articles): Teen dies at home—Peggy Rainey, a 15-year-old South Kruesdale Avenue girl who had been hospitalized
recently, died this morning at home and the County coroner’s office removed her body, police said. They do not suspect foul play. The girl’s grandmother found her unresponsive and not breathing at 5 AM. The coroner will determine the cause of death.

AUTOPSY (October 9, 2001):

• Intracerebral hemorrhage due to ruptured berry aneurysm of proximal left posterior communicating cerebral artery
• Acute “jet lesion” blood channel into left frontal lobe and left lateral ventricle with 30ml left lateral ventricle hemorrhage
• No gross evidence of thrombosis or chronic hemorrhage of aneurysm. No hemosiderin staining around site of aneurysm
• Acute pulmonary congestion and edema
• No alcohol, drugs, carbon monoxide or growth from blood cultures
• Mid and distal left forearm have multiple linear parallel incisional-type scars, some of which appear to be paired injuries. Inner mid left shin has 8 parallel linear incisional-type scars

PART 2—LEGAL

I. The Accusation/Cause of Action

Plaintiff originally filed her complaint in September of 2002.

• Plaintiff alleges that Peggy’s pain and suffering and her death could have been prevented had the healthcare providers met their respective standards of care and detected or diagnosed Peggy’s aneurysm.
• Had this aneurysm been detected, plaintiff claims that Peggy could have had life-saving surgery to clip the aneurysm.
• Peggy’s death was proximately caused by the defendants’ negligence in failing to detect, diagnose, and treat her aneurysm.

II. What Would Greg Do (WWGD)?

Greg Henry, past president of The American College of Emergency Physicians (ACEP), Professor of Emergency Medicine at the University of Michigan, and CEO of Medical Practice Risk Assessment, has been an expert witness in over 2,000 malpractice cases.

Greg discusses evaluation of headaches, trial strategy, and if he would have settled.

“Even the largest plaintiff’s whore in the world cannot testify that every headache needs to be worked up for a subarachnoid hemorrhage”
This is a patient that I have seen hundreds of times. Headache is one of the most common complaints in the emergency department. Peggy had a sudden onset of neck pain after coughing, but the majority of these patients will have nothing.

This patient was seen unfortunately during the time of the World Trade Center attack. If you don't believe things like that can distract physicians, you don't understand human physiology; all of a sudden our minds are concentrating on something else and now we have a 15 year-old girl whose history and physical examination seem absolutely benign or histrionic.

Parenthetically, I fortunately was not working on that day, but, just like the Kennedy assassination and the landing on the moon, even at my advancing age, I remember distinctly where I was and what I was doing. This will never be a defense for a physician, but it is certainly something we all understand with regard to focus and concentration. It is my general rule never to take personal phone calls, speak to accountants, attorneys or business people while seeing patients. We have enough issues to think about without further cluttering our minds. The smallest distraction might be a problem.

My general thoughts on the case are biased by the nature of the patient herself. I have written on headaches for years. But in the heat of the emergency department, when you have a teenager who has emotional problems, is a known self abuser, and comes in with the headache complaint, there is an innate prejudice against finding physical disease. All of us has had patients with severe psychiatric problems who were later found to have an organic process. There is a point beyond which reasonable suspicion has to be tempered with a statistical probability.

The strategies of the defense are clear; emphasize the rare nature of this disease in a 15 year-old and the standard work up for a headache patient in the ED. Even the largest plaintiff's whore in the world cannot testify that every headache needs to be worked up for a subarachnoid hemorrhage. The plaintiff will talk about the lost opportunity and the fact that subarachnoid hemorrhage is an imminently treatable disease. This is a classic battle of perfection versus standard of care. I would think that a reasonable jury would understand that the work-up of this patient did comport with the standard of care.

This case is imminently defensible simply because you either decide that you're going to work-up every single headache with an MRA and spinal tap or you're going to use some judgment. I don't believe you should take unreasonable chances with the patient's life; by the same token, what constitutes the acceptable "miss rate?" The jury must understand that every adult human being has had a headache. Not every adult has had a major work-up and spinal tap to decide the cause. It would be a mistake for the defense to even mention the 9/11 scenario as having anything to do with a defensive posture in this situation.

The question of settlement in this case is not a difficult one for me. It was not for another 28 days that the disease entity became obvious. The history taken and the
physical exam performed seemed logical. The patient was improving. If you don't
defend this one on a standard of care basis, what case do you defend? With my
insurance hat on, this doctor deserves vigorous defense all the way to verdict.

>Authors' note: Greg Henry gets it out of the gates ... let's go to court!

### III. The Depositions/The Trial

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<td>The patient: Peggy Rainey</td>
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<td>ED physician defendant: Bruce Hanning</td>
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<td>ED physician assistant: Kelly McKinney</td>
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<td>Plaintiff's attorney: Louis Latiff</td>
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<td>Plaintiff's Emergency Medicine expert witness #1: William Biggs</td>
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<td>Plaintiff's neurology expert witness #2: Leslie Neuman</td>
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<td>Defense attorney: Bill Bonezzi (actual attorney)</td>
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<td>Defense Emergency Medicine expert witness: Edward Eubank</td>
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<td>Forensic pathologist for defense: Harry Manning</td>
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Direct examination of plaintiff's expert witness Dr. William Biggs, board certified emergency physician, by plaintiff's attorney Louis Latiff.

>Authors' note: The witness alleges that the history taken was incomplete and that if it
had been adequate, the doctor would have been alerted of sentinel headache/bleed. His
allegations are cleverly rebuffed later by the defense attorney.)

Q. Is the history taken adequate for an emergency room physician?
A. No.

Q. Why not?
A. First, the history of the present illness is totally inadequate. It does not meet the standards [for
a patient] who presents with a headache. The review of systems is inadequate and inconsistent
with other data. The physical exam records the blood pressure one time, and it's a crisis blood
pressure. This is never addressed or repeated. One big deficiency is this record does not
record a differential diagnosis, which is... which is a major feature of every encounter. And the
discharge condition isn't given. There's no re-evaluation. There's nothing about response to
treatment. It's an inadequate record.

Q. What is the nature of the history of present illness that you have cause for concern for?
A. The standard for history of present illness that every medical student is taught early in their
training is that there are seven items that have to be addressed, and these items aren't addressed,
and if they had been addressed, I think the outcome would be different. These items are the
location of the pain. That is addressed. The character, throbbing. That is addressed. The onset
and the time course. Is it sudden onset? That's a major thing that isn't addressed. The mitigating
factors or precipitating factors, we know from the run sheet that this was precipitated by coughing,
and that isn't addressed [by the doctor]. So, you know, by not addressing these important
elements, the consideration of the cause of her headache was not there.
Cross-examination of plaintiff's expert witness Dr. Biggs by defense attorney Bill Bonezzi:

Q. You indicated that the history and physical were deficient because not all of the items were obtained that should have been, those seven items that you talked about?
A. Yes.

Q. Well, he found out about the location of the pain, did he not?
A. Yes.

Q. He found out about the character of the pain?
A. That's true.

Q. He found out about the onset or the time course of the pain? “Patient complains of throbbing frontal headaches for a few hours prior to arrival.”
A. Yes.

Q. Now, I note that on the history of present illness portion of the record, there is a statement there that says “Stated it started after a coughing spell.”
A. Okay, I'm sorry. So that was addressed. I'm sorry.

Q. He also found out...
A. The time of onset, yes, but not the suddenness or its relationship to the cough.

Q. Well, was there suddenness?
A. He doesn't say. He does say it started after the coughing spell.

Q. Well, we just read what the grandmother said (not reproduced here), and her deposition said, “I don't think the neck and the head pain was brought on by the coughing.” So, I guess what I'm looking at is, you know, there's nothing here or in the grandmother's testimony that would suggest that there was a sudden onset of headache, was there?
A. It's in the EMS note: “Patient had a sudden onset of neck and head pain this AM after coughing.”

Q. Well, do you know whether or not the sudden onset of head and neck pain was brought on by the coughing? We don't know, do we?
A. Right. We don't know with an absolute degree of certainty, but putting the whole thing together, it all fits. And it's my opinion, and I hold this to a reasonable degree of certainty, that the sentinel bleed was brought on by the coughing and/or the hypertension.

Q. ... are you aware that Dr. Harry Manning (the forensic pathologist) disagrees that there was a sentinel bleed?
A. No.
Authors’ note: What? What? Not a sentinel bleed? How is defense ever going to go there? Ever heard of hemosiderin? Yeah, I have too—23 years ago in medical school.

Continued cross-examination of EM expert witness Dr. Biggs by defense attorney Bill Bonezzi:

Q. You’re aware of what hemosiderin is, right?
A. Yes.

Q. Okay. And are you aware of whether or not, if there is a subarachnoid bleed, that if the brain is examined in an autopsy, there’ll be evidence of hemosiderin?
A. Actually, I never thought about it. I don’t know. I don’t know the answer to that.

Q. Fair enough. Did you review...
A. I practice in the emergency department.

Q. Did you review the deposition of Dr. Harry Manning, who is a forensic pathologist?
A. No.

Authors’ note: This guy is getting paid how much? Well, likely more for an hour on the stand than you made the last three shifts arguing with drunks at 3 AM and he didn’t even read the path report? Really?

Deposition (direct) of defense expert witness Dr. Harry Manning (forensic pathologist) by defense attorney Bill Bonezzi:

Q. Did you reach any conclusions concerning Miss Rainey’s cause of death?
A. Yes. The cause of death was a ruptured aneurysm.

Q. To what extent was the history important in determining the cause of death?
A. It had very, very, very little relevance.

Q. What factors did you take into account in coming to a decision on that?
A. The autopsy report and the microscopic slides. There was no evidence of thrombosis or clotting of the aneurysm. There was no evidence of chronic hemorrhage or evidence of a previous hemorrhage. There was no hemosiderin staining anywhere around the site of the aneurysm. There’s no evidence that she suffered a previous bleed anytime more than four or five hours before she died.

Q. And you reached that conclusion based upon what factors?
A. The autopsy report findings call it an “acute jet lesion.” There’s no evidence of thrombosis and no evidence of hemosiderin.

Q. When you reached this conclusion, were you aware that Peggy Rainey had gone to the St. Steven’s emergency room on September 11, 2001—and complained of a severe headache?
A. Yes.

Q. You are able to eliminate any consideration as to whether this history suggested that there may have been some earlier problem with this aneurysm that occurred prior to October 8th, 2001?
A. Although she may have had a headache and nausea and vomiting four weeks earlier, there is no evidence in the autopsy that she’d had a previous bleed. There is absolutely no evidence in the autopsy of anything being older than a couple of hours, and I concur with the pathologist who did the report and the coroner who signed it off.
Authors' note: So there was no staining with hemosiderin, and therefore, she didn’t experience a sentinel bleed. Maybe an enlarging aneurysm or other type of headache, but not a bleed. Even if a CT and LP had been done on September 11, he contended it would have been negative and not changed the outcome. The defense attorney further uses Dr. Manning’s testimony to focus on the extremely rare occurrence of this diagnosis:

Q. How common is it for a 15-year-old to have an aneurysm of the nature that Peggy Rainey did?
A. Rare

Q. How rare?
A. Very rare

Q. How many cases?
A. Out of about 6,000 autopsies, I think I remember personally seeing two.

Authors' note: The whole crux of the plaintiff’s allegation is that if a CT and LP had been done, the sentinel bleed would be confirmed and the aneurysm would have been diagnosed and clipped. The following is this allegation played out by Dr. Biggs (plaintiff’s ED expert witness) and then by Dr. Leslie Neuman, a neurologist also hired by the plaintiff as an expert witness:

Direct examination of plaintiff’s ED expert witness Dr. Biggs by plaintiff’s attorney Louis Latiff:

Q. Should Dr. Hanninger have ordered a CT scan?
A. Yes.

Q. What would the CT scan have shown?
A. The CT scan has a 95 percent sensitivity to see a subarachnoid hemorrhage.

Q. What if the CT scan hadn’t shown it?
A. If the CT scan does not show a subarachnoid hemorrhage and it’s a high-suspicion case, then the standard of care is to perform a lumbar puncture, which is sensitive to detect virtually 100% of subarachnoid hemorrhages.

Q. Is it your opinion, Doctor, that Dr. Hanninger’s failure to order a CT scan for Peggy Rainey was beneath the standard of care?
A. Yes.

Q. Is it also your opinion, Doctor, that Dr. Hanninger’s failure to order a lumbar puncture was beneath the standard of care?
A. Yes. I know that the risk for someone who has a sentinel bleed, the risk of a re-bleed within three weeks is 50 percent, and the risk of death from a re-bleed is about another 50 percent. For the first month after a sentinel bleed, the risk of a re-bleed is about 1 to 2 percent each day, and neurosurgical interventions greatly reduce this risk. And I would say to a reasonable degree of medical certainty, looking at the whole time course and all the data ... That’s my opinion. Is it absolute? No, nothing in medicine is ever absolute. But it’s more likely than not, in my opinion.
>Authors' note: Another of the plaintiff’s expert witnesses was Leslie Neuman, a neurologist. He gives testimony, but it seems that his standards are of a neurologist, not of an ED physician.

Direct examination of plaintiff’s expert witness Dr. Leslie Neuman (neurologist) by plaintiff’s attorney Louis Latiff:

Q. You have many patients who come into your office with neck pain and a headache, do you CT scan [all of] them?
A. Do you want the real answer?
Q. I do.
A. Yes. Every patient that I see that has a headache gets a CAT scan.

Q. Is there any difference in the standard of care and treatment between neurologists and emergency room physicians?
A. I don’t think so. I do not—I don’t believe so. I mean, there are certain things that transcend certain specialties, where there is a lot of crossover. In this case, I think an emergency room physician [and] a neurologist, those front-line specialties could evaluate this type of situation.

Q. Was the standard of care met in the emergency room on September 11, 2001?
A. I believe it was not met.

Q. What is the basis of your opinion?
A. ... the many issues we talked about, unusual headache, first time severe headache unusual enough to warrant transport to an emergency room, headache onset with coughing, some nausea and vomiting, complaints of neck stiffness, high blood pressure, all of those factors together ...

Authors' note: Well, how about the high blood pressure? It was checked once and was 174/94, certainly high for a 15 year-old girl (who probably usually runs 90/60), but not unexpected for someone in severe pain. A recheck might have been nice since the elevated BP was brought up more than once by the plaintiff as a risk of SAH. Her blood pressure was elevated on 9/11, but did she have a diagnosis of hypertension?

Additional considerations are whether or not the hypertension was a physiologic response to an acute CNS event? It is a well-known phenomena that acute stroke results in a hypertensive responsive to preserve cerebral perfusion pressure. If the claim is made that the hypertension is due to severity of pain (you see where I’m headed with this), how can we claim this wasn’t an unusual headache, based on the intensity alone?

Continued cross-examination of plaintiff’s expert Dr. Biggs by defense attorney Bill Bonezzi:

Q. You have a concern with the blood pressure?
A. This was another big “red flag.” She had a blood pressure of 174/95. This is a 16 year-old girl with no record of hypertension who comes in with this high blood pressure. Hypertension is a major risk factor for severe headaches. Those readings are equivalent to a middle-aged man coming in with a blood pressure of 250/150. We see strokes in adolescents with blood pressures of 150, 160, 174. That’s a serious red flag flapping in the breeze that something’s wrong here.
Q. (By Mr. Bonezzi): [tries to interrupt]: Dr. Biggs ...
A. Hypertension is a risk factor for subarachnoid hemorrhage, and acute headache in a 16-year-old with that blood pressure in itself a neurological emergency. The blood pressure was never addressed.

Authors' note: Ever see the movie "A Few Good Men?" When Tom Cruise has Jack Nicholson (Col. Jessup) up on the stand and decides to go for broke and provoke him into revealing what actually happened with a new recruit who died, with the Nicholson's subsequent, famous line, "You can't handle the truth!" Though the plaintiff's attorney's comparison to an adult BP of 250/150 sounds outlandish to me, I couldn't say for sure if he actually did have data to support that statement. The defense attorney must have been less sure, but decides to go for broke.

Continued cross-examination of plaintiff's expert William Biggs by defense attorney Bill Bonezzi:

Q. Get me the article or give me the study that you're referring to that compares her blood pressure with a male's blood pressure that would be 250/150.
A. I don't have an article that compares that. I'm just telling you that in medical practice, I've been taught this by my professors and so forth, that an adolescent with a blood pressure in that range is serious, particularly an adolescent girl.

Q. You don't have anything to support what you're saying, is that right?
A. Yes, I do. I have 25 years of experience as an emergency physician.

Q. Doctor ...
A. I have some fine professors who have taught me that over the years.
Q. Doctor, that doesn't count in a courtroom.

Authors' note: Embarrassing. Ever thought of being an expert witness? The pay is quite good, by the way ...

Well, did she have hypertension or transiently-elevated blood pressure? Is the contention that her elevated BP was a cause of the stroke acutely, that she had chronic hypertension setting her up for the aneurysm or more likely that cerebral autoregulation was responding to some CNS insult? She did have a recheck, but not in the ED. It was at the PCP office four days later.

Cross-examination of plaintiff's expert witness Dr. Leslie Neuman (neurologist) by defense attorney Bill Bonezzi:

Q. And, oh, by the way, you are aware that when she went to see her PCP a couple days later, her blood pressure was normal?
A. Right

Authors' note: We've heard a lot from the plaintiff's folks. How does the defendant rebut this witness? Enter Edward Eubank, Professor of Emergency Medicine. Board certified in emergency medicine, internal medicine, and critical care medicine. He has over 100
original publications, over 50 textbook chapters or invited review articles, and over 100 research abstracts. One of his main contentions is that the primary consideration in a 15 year-old girl with headache, neck pain and vomiting is meningitis.

Cross-examination of defense ED expert Dr. Edward Eubank by plaintiff's attorney Louis Latiff:

Q. [Would it] be unusual for a 15 year-old girl to come into an ER complaining of a severe headache?
A. That isn't the most common age group that comes in with primary headache complaints.

Q. And you're aware that she went to the ER on 9/11, the day that the Twin Towers were struck by the terrorists?
A. I am

Q. Wouldn't you find it even more unusual that a teenager would present herself to the ER complaining of a severe headache if it was simply a common headache where she never presented to the ER with headache?

Defense, Mr. Bonezzi: Objection!

A. No, not necessarily. In fact if anything it could almost be the other way around, that could have induced a stress reaction.

Q. I'd like to give you a hypothetical: A patient's headache was bad enough to present herself to the ER on September 11, 2001. The patient arrives in an ambulance. She was not able to walk as she normally would and was only able to be transported via wheelchair. The patient complains of a headache described as one that is killing her, a stiff neck, nausea and vomiting, the inability to walk and talk. Would your treatment differ in any regard to the treatment given by the ER physician in the file that you reviewed?

A. Well, you're outlining a hypothetical case that has some differences from the documented record in this case. If I picked up that chart [my] number one concern would be meningitis. The number two would be possible meningitis. It would not be subarachnoid hemorrhage. It's very uncommon in 15 year-olds.

Q. And I gather that you would not have ordered a CT scan for this patient?
A. I do not have sufficient information to be able to answer whether a CT scan would be indicated. There are a whole number of additional questions including [questions related to infection, history of headaches, severity of headache] and dependant to the answers to those questions, [I would decide].

Q. Isn't the arrival of someone in an ambulance an indicator that the condition is serious?
A. Yes and no. We have patients that come in by ambulance who are taken off the gurney and sent to the waiting room. Some people use ambulances like taxis. We do a very careful evaluation of a patient that comes in by ambulance, but that doesn't always mean they get put at the top of our priority list.

Authors' note: Can we causally relate her headache on September 11 to the ruptured aneurism on October 8?
Q. In your view, you're not convinced that the patient had a sentinel bleed on 9/11?
A. I don't believe we know whether she had a sentinel bleed on September 11th. I'm not a pathologist.
I addressed the standard of care in getting a CT scan for working up a possible hemorrhage.
Given her symptoms complex, given the course of her subsequent symptoms and how long they went on, I would say there's a very good chance that she did not have a sentinel bleed.

IV. Guest Interview—The Legal Analysis: William Bonezzi, J.D.

- Bonezzi, Switzer, Murphy & Polito, Cleveland, Ohio
- Mr. Bonezzi was the actual defense attorney for the case

Authors: The doctor was obviously concerned about the patient by asking her if this was the worst headache of her life, but failing to define onset. There were also some discrepancies between the documentation and testimony of the grandmother. How was this rebutted in court?

WB: The grandmother was cross-examined regarding her recollection of the ED encounter. Her testimony did not comport with the statements she gave to the EMS upon their arrival. The complaints the granddaughter gave to EMS were also contrary to what the grandmother said. The documentation by EMS was important to set the stage regarding what was said to the first responders. I did not argue with the grandmother; instead, I brought out each discrepancy of her testimony vis-à-vis the documents. I knew that was going to be important to the jury, and arguing with someone who was grieving for the loss of her grandchild was inappropriate. The testimony of the PA was very important in supporting what the documents indicated. I ended my questioning with the significance of “the worst headache in your life.” I asked what would have been done had the answer been affirmative as opposed to being negative.

Authors: What were your main arguments to the jury?
WB: I felt that I had a good standard of care witness, and an even better proximate cause witness. I explained, both in my opening and closing, what a sentinel bleed was, its signs and symptoms and what one would expect to see on autopsy. I also discussed a “jet lesion,” the lack of hemosiderin and the fact that it was greater than 21 days from the time the plaintiffs claimed there was a sentinel bleed until the SAH. I indicated that the further out one goes from the original symptoms of headache the less likely the original problem was a sentinel bleed. My forensic pathologist was very good at explaining the dynamics of a sentinel bleed, the sequelae of same, and the medical reasoning why the 9/11/01 event was not a sentinel bleed. Plaintiffs did not engage a forensic pathologist and were left only with crossing my expert.

Authors: Peggy was a “cutter,” as described in the autopsy. Were you able to use this as an argument at trial that she was somehow overreacting or not giving accurate story?
WB: I did not go into the “cutting” because I chose not to retain a psychiatrist to explain its significance. I did not feel that it aided in the defense of the case, which is my estimation needed to be focused on the medicine. Of interest was the fact that the decedent’s sisters lived with their father and only Peggy lived with their grandmother. They all lived within
the same city. The mother lived in Arizona and rarely came back to visit. Neither the mother nor the father were witnesses in the case.

**Authors:** If there is a choice, a standards defense is always preferable, but in this case, causation (hemosiderin) was extremely important. What was your "hang your hat" argument at the trial?

**WB:** I will always try to defend a case on both standard of care (SOC) as well as causation. If I do not have a standards defense, I will at times even admit that the SOC was breached. In those circumstances, I literally have to show that the breach of the standard did not cause the injury or death, and concentrate on cause. The more I focus on that, the more the plaintiff’s attorney has to follow suit. It is then a trial of medical experts. To proceed with a true cause defense requires a good expert who has the talent to educate and explain to the jury the significance of cause, why the injury or death was not avoidable, and that under the best of circumstances, the outcome would have been the same.

**Authors:** When the jury was out, what did you think were you chances of winning?

**WB:** I felt very good about the case, but with every case that involves a lot of technical details, I questioned whether I did an adequate job of explaining the medicine and its significance. My physician was very well-prepared, as were my experts. I believed that if my explanations were appropriate, we would win on SOC, but I always felt that the best argument was causation, which this jury never had a chance to decide!

**V. The Verdict (2005)—Events:**

- On September 13, 2005, Judgment Entry concluded in part that as a neurologist, Dr. Neuman was not qualified to testify as to the standard of care in the emergency department.
- One week into the trial, the family physician, Dr. Hernandez, was dismissed with prejudice.
- The trial continued on into the second week with the defense of Dr. Hanninger (defendant ED physician).

At the conclusion of the trial, a verdict of 7–1 returned for the defense on Standard of Care. The jury never deliberated on causation.

**Summary of verdict:** For the defendant-physician.

**VI. Guest Interview: Dr. Leslie Neuman (name changed)—Neurologist for the plaintiff:**

**Authors:** What were your main contentions about the evaluation at the ED visit?

**LN:** This was not an ER frequent flier. If her headache was bad enough to come to the ER, she should have had a CT scan.

**Authors:** Were you surprised with the verdict?

**LN:** I thought money would be paid.
Continuation of guest interview: William Bonezzi, Esq., of Bonezzi, Switzer, Murphy & Polito, Cleveland, Ohio. Mr. Bonezzi was the defense attorney for the case.

Authors: The case was appealed due to the trial judge’s determination that the neurologist, Dr. Neuman, was not qualified to testify concerning standard of care in the ED. How did this occur?

WB: The jury never decided the cause issue because they found 7-1 that the physician met the standard of care (SOC). The appeal was a formality, and the defense verdict was upheld. Originally plaintiffs retained Dr. Neuman as both a SOC expert as well as a cause expert. I was able to demonstrate that Dr. Neuman did not work in an ER, did not know protocols and procedures of an ER, and was not a neurosurgeon. He could not provide testimony relative to what would be done on behalf of Peggy Rainey had a CT scan been ordered and demonstrated a leak. He could not answer whether this “leak” if found would have been “coiled” or removed surgically. As a result, the original Judge was going to rule that his intended testimony would be limited. As a result, plaintiff’s counsel dismissed the case with the right to re-file within one year. The case was re-filed, but counsel never retained a neurosurgeon and did not retain a forensic pathologist. As the case progressed, it was apparent that plaintiffs did not have an ER expert. I moved once again to have the case dismissed.

Authors: Any other thoughts or interesting observations from the trial/ordeal?

WB: As with any case, preparation was key. I felt that the case was analyzed correctly and the proper experts were retained. The issues were crystallized and testimony was obtained to support the arguments. The most important aspect, however, was the defendant physician’s testimony. He had gone over the records thoroughly, he had reviewed his deposition so that he was extremely familiar with it, he was available for many preparation meetings, and he worked with me through the case. I also felt that plaintiff’s counsel did not appreciate the nuances of the issue involving hemosiderin, and as a result was not prepared to counter it at trial.

VIII. Medical Discussion—Evaluation of Headache, Diagnosis of SAH

Guest author: Jonathan Edlow, MD, FACEP
Associate Professor of Medicine, Department of Emergency Medicine, Harvard Medical School
Vice Chairman, Department of Emergency Medicine, Beth Israel Deaconess Medical Center

Dr. Edlow is Chair of the June 2008 American College of Emergency Physicians (ACEP) Headache Clinical Policy Task Force.

In addition to clinical duties, Dr. Edlow has authored two books for the general public: Bull’s Eye: Unraveling the Medical Mystery of Lyme Disease, which was featured on Terri Gross’ NPR show Fresh Air, and his newest book: The Deadly Dinner Party and Other Medical Detective Stories.
I will start out by disclosing that I act as an expert witness on medical malpractice cases, both for plaintiff and defense, and I will further state that diagnosis of subarachnoid hemorrhage (SAH) is a strong academic interest of mine.

With those caveats, let's dissect the case that has just been presented. First, for at least two decades, SAH has been identified as one that emergency medicine physicians have been taught to “never miss.” Of course “never” is a lofty goal and, given the variations with which patients can present, the cost of never missing a SAH (CT and LP on every headache patient) would be huge. The most common reason for misdiagnosis is not getting a CT scan.\(^1\)\(^2\) The notion, as the neurologist testifies, that “every patient with a headache” gets a CT scan is ridiculous. That may or may not be true for a neurologist, but is certainly not true (nor should it be) in emergency medicine.

So which patients with headache do need a CT?

There is no well-derived and validated decision rule to answer this question. This patient is a 15 year-old girl with a severe headache, without a clear-cut history of a prior headache syndrome, associated with vomiting and that might have started abruptly. There is considerable discussion regarding if it was sudden-onset or not. Although the lawyers can parse out different statements from different individuals, the reality is that the defendant could have obtained this simple fact in about 5–10 seconds of history-taking, and should have. But let's give him the benefit of the doubt on this point.

We still have a young woman who has an unusual, severe headache associated with vomiting; does this patient need a scan? She is neurologically intact with a supple neck. Does the exam help? Unfortunately, there are many serious, treatable neurological diagnoses that can present with a normal exam, including SAH. Meningismus may not develop for 12–24 hours and might not be present at all. So, these are findings that are helpful when present, but useless when not.\(^3\)

Are there any other clues from the case? A blood pressure of 174/94 is important. Whether this number is the same as 250/150 in a male adult is irrelevant. What is relevant is that 174/94, in a 15 year-old girl (whose normal pressure is likely closer to 90/60, as the authors point out) is an extraordinarily high value. This blood pressure is a big red flag—but not for the reason that the plaintiff’s expert opines. He suggests the patient was hypertensive and therefore at risk for SAH. To me, the significance is that such a high pressure suggests (and only suggests) that something might be going on in the central nervous system. Yes, it could be due to pain, or anxiety. But 174/94? At this level of blood pressure in a 15 year-old, the burden is on the physician to prove that this reading is not significant.

At an absolute minimum, treat the pain and anxiety and re-check the blood pressure. Failure to do this is an error. She had a normal blood pressure four days later in the pediatrician’s office, demonstrating that she is not chronically hypertensive. But it does not mean that the pressure was benign, since it could have signified a serious intracranial problem four days prior in the ED and which has subsequently stabilized.
Aneurysms are rare in children; only a few percent of patients with symptomatic aneurysms are children. In one single-institution review, there were only 77 aneurysms found over 27 years. So, I can easily imagine not thinking about a SAH in a 15-year-old with a headache. But SAH is not the only potential cause of this girl’s headache. One should have a checklist of “serious” or “cannot miss” diagnoses (things that cause big problems and that are treatable) for every headache patient, at least to consider by history and physical examination. This patient could have hypertensive encephalopathy, meningitis, a non-SAH intracranial bleed (AVM, tumor, vasculopathy), cerebral venous sinus thrombosis, pituitary apoplexy, arterial dissections and other possible diagnoses. All are uncommon, but the bottom line is that this presentation of a severe, unusual headache in the presence of severely elevated blood pressure (which may have developed abruptly) demands an evaluation. Therefore, I would have done a CT followed by an LP if the CT was non-diagnostic. I believe that it was a violation of standard of care not to perform these tests.

That said, would the results have changed the outcome? I don’t think so. Regarding proximate cause, the forensic pathologist’s testimony is key. If her aneurysm had bled at the time of the first visit, there should have been gross or microscopic signs of the bleeding. Our old friend, hemosiderin, should have been present, and it wasn’t. The fact that the plaintiff’s expert had not read the pathologist’s deposition is astonishing; for an expert not to know the facts of the case is sloppy and irresponsible. Legally, the absence of hemosiderin is the key to the case. The aneurysm had not bled at the time of the first visit; the glove does not fit.

Sentinel headache and sentinel bleed are two different terms that are often used interchangeably, but they actually describe two very different things. A sentinel headache is a severe, unusual headache that precedes a subsequent SAH. A sentinel bleed is an actual bleed that precedes a subsequent SAH. Sentinel bleeds are a subset of sentinel headaches. The vast majority of sentinel headaches are actually bleeds that, in retrospect, were not diagnosed as bleeds at the time (either because the patient never sought medical care or the medical practitioner did not do a work-up). If all sentinel headaches were worked up, the vast majority would be found to actually be bleeds (in other words, a first, clinically mild SAH).

How do we know this? In a pooled analysis of 813 patients with thunderclap headache, normal CT and CSF, 0/813 patients had SAH or sudden death on long-term follow-up. This fact is in part the basis for the ACEP clinical policy on headache that states that patients with thunderclap headache can be safely discharged after a negative CT and LP. However, occasional patients with acute, severe headache will have a cerebral aneurysm that is symptomatic (dissected, clotted or acutely expanded) but not ruptured. Despite the number of references, these are the stuff of case reports and should not guide routine care. Some have suggested that CTA should be done to rule out SAH, but I am against this strategy for many reasons too numerous to outline here.
My bottom line with this case: Don’t over-think (or under-think, as I think was done here) a case. In patients with unusual, severe headache with vomiting (and extremely high blood pressure that is not otherwise explained), do the CT and LP. If these are negative, you have done a standard work-up, and although you can still be sued if a SAH is missed, it is much more easily defended.

Should she have had an MRI or CTA? This is a matter of judgment.12,14 I would not testify against a physician who made a thoughtful decision not to pursue work-up beyond CT and LP. In this particular case, an MRI or CTA would have likely diagnosed the aneurysm, which presumably had acutely expanded, clotted or dissected. The outcome would likely have been far better, but vascular imaging is not standard of care for all patients with thunderclap headache.

In summary, I think that the standard of care was violated, but there was no proximate cause. The pathological evidence shows that she did not bleed at the time of the first ED visit. Therefore, had the standard work-up been done, the CT and the CSF most likely would have been normal, and the outcome would have been the same.

**Authors’ Summary**

Besides hoping this patient never walks (or is transported by ambulance and then wheelchair) into your ED, what can we take away from this tragic case?

- The initial ED record read well, but during deposition and trial testimony, was revealed to be incomplete. How could her headache have been 5/10 when she was at one point screaming and sobbing in pain?
- There was a discrepancy between the triage note and the physician’s note, indicating that the triage note was never read.
- There was at least some diagnostic uncertainty; the presenting symptom was headache and the final diagnosis was headache, indicating that a definitive diagnosis had not been found. This is fine, but in these situations:
  - Discuss this uncertainty with the patient and family so they can become “health care partners” and return if symptoms change, worsen, or persist.
  - Repeat and record your evaluation after some time has passed.
  - Document a progress note to explain why you do not think the most serious causes of the presenting symptom are occurring.
- One technique is to apply what we, the authors, call the “front door-back door” approach:
  - Front door: In-depth exploration of the presenting complaint: onset, duration, exacerbators, etc.
  - Back door: Exploration of top items on the rule-out list: using a headache as an example we need to ask specific questions to rule out SAH (onset), meningitis (fever), mass (weight loss), and others.
- This chapter in no way recommends obtaining CT scans on all HA patients, since in the hands of many experienced EM physicians, this diagnosis may still have been missed. It does argue for an appropriate history, specifically concerning the onset of HA, and an accurate description of the clinical picture.