

Bouncebacks

The Case of a 21-year-old Woman with Sinus Pain

In *Bouncebacks*, which appears periodically in JUCM, we provide the documentation of an actual patient encounter, discuss patient safety and risk management principles, and then reveal the patient's "bounceback" diagnosis.

Cases are adapted from the book *Bouncebacks! Emergency Department Cases: ED Returns* (2006, Anadem Publishing, www.anadem.com; also available at www.amazon.com and www.acep.org) by Michael B. Weinstock and Ryan Longstreth. The book includes 30 case presentations with risk management commentary by Gregory L. Henry, past president of The American College of Emergency Physicians, and discussions by other nationally recognized experts.

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A 21-year-old Woman with Sinus Pain

I would rather have a patient with a stab wound to the chest than a patient with a serious underlying problem who just wants antibiotics and a quick evaluation. Is there a way to tease out benign-appearing patients who are "pre-crump?"

This month's case is that very patient—a raindrop in a torrent of mucus and purulent drainage.

Initial Visit

(Note: The following, as well as subsequent visit summaries, is the actual documentation of the providers, including punctuation and spelling errors.)

Chief complaint (09:14): Sinus pain and congestion

Triage/nursing: Reports sinus congestion and pain for the past 3 days no fevers reports yellow sinus

drainage. Took tylenol

PMH:

Allergies: NKDA

Medications: Diabetic pills, BCP

PMH: Diabetes, type 1

PSH: Negative

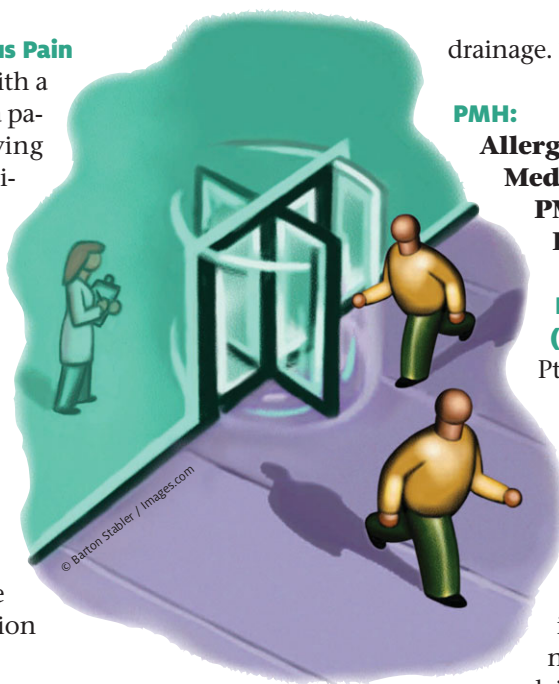
HISTORY OF PRESENT ILLNESS (09:49):

Pt states maxillary and right frontal sinus pain for the past 2 days. Pt states she has been severely congested. Denies visual problems or pain with movement of eyes. Denies vomiting or chest pain. Resting comfortably on exam. She is type 1 diabetic. Denies shortness of breath. No fever, unexplained weight change or malaise.

No cough, n/v/d, abd. pain, urinary Sx, HA, rash.

EXAM (09:50):

CONSTITUTIONAL: Alert and oriented X3, well-nour-



Vital Signs										
Time	Temp (°F)	Rt.	Pulse	Resp	Syst	Diast	Pos	O2 sat	O2%	Pain Scale
06:15	97.8	0	131	18	156	88	S	95	ra	10

ished, well appearing, in no apparent distress

HEAD: Normocephalic; atraumatic

EYES: PERRL, no scleral icterus

NOSE: The nose is normal in appearance without rhinorrhea. TTP over right maxillary sinus

RESP: Normal chest excursion with respiration; breath sounds clear and equal bilaterally; no wheezes, rhonchi, or rales

CARD: Regular rhythm, without murmurs, rub or gallop

ABD: Non-distended; non-tender, soft, without rigidity, rebound or guarding

SKIN: Normal for age and race; warm and dry; no apparent lesions

DIAGNOSIS (09:50):

Maxillary sinusitis, acute

ORDERS (10:13):

Check pulse

DISPOSITION:

Discharge home ambulatory. Follow up with family practice in 2-3 days. Rx amoxicillin 500mg PO TID #30, ultram 50mg #20. After care instructions for sinusitis. Record released from tracking board at 07:17.

Discussion of Documentation and Risk Management Issues at Initial Visit

Error 1

Error: Tachycardia not appreciated.

Discussion: The normal heart rate is 60 to 100 beats per minute, but can be elevated with fever, pain, or even the anxiety of going to see a doctor. A heart rate of 131, however, is a red flag for more serious illness. Previously, we have discussed a study by Sklar, et al published in 2007 in the *Annals of Emergency Medicine* which found the most common theme in avoidable deaths within seven days of an emergency department visit was unrecognized tachycardia (occurring in 71% of the medical error cases).

If an abnormal vital sign such as tachycardia with dehydration or an acute fracture is expected, this can be noted in the chart. If unexplained, further evaluation is necessary.

Teaching point: When a vital sign is abnormal, it needs to be rechecked and discussed in a progress note.

Error 2

Error: System breakdown.

Discussion: At 10:13 a.m., an order was written to

recheck the pulse, but the patient was discharged before this was done. If the recheck had been accomplished and found the pulse to be 88, this would have been reassuring; a pulse of 151 would have prompted re-evaluation before discharge.

Teaching point: A mechanism needs to be in place to ensure orders are carried out in a timely and reliable manner.

Error 3

Error: Past history not explored.

Discussion: Diabetic patients do not need a finger stick blood sugar at every visit, but their blood sugar needs to be considered. This is easily accomplished in the history with a simple question as to the most recent blood sugar.

If our patient had reported that her blood sugar level that morning was 81 mg/dL, we would have been reassured. If she hadn't checked it in two weeks, we would have been concerned.

Additional historical concerns include complaints of polyuria, polydipsia, weight loss, history of diabetic ketoacidosis (DKA), or recent HbA1c test.

If the patient has never heard of this number, that is also useful information!

Teaching point: Patients with significant risk factors need to have them explored with history or further testing.

Error 4

Error: Abnormal oxygen saturation not rechecked.

Discussion: Another abnormal finding is the "5th vital sign"—the pulse ox.

Whereas it may be helpful to obtain more and more data on each patient, there is no point in checking if the results will be ignored. The sat of 95% is not grossly abnormal, but is a little surprising in a young, seemingly healthy woman. In a malpractice action, it is a lot more difficult to defend not acting on an abnormal result, than it is to defend not ordering an unnecessary test.

Teaching point: Do not obtain data which will be ignored.

Emergency Department Visit 2 Days Later (19:30)

- Chief Complaint – Hyperglycemia
- Vital signs: Pulse 155, BP 158/98, sat 100%
- Physician evaluation: Decreased LOC, Responds to verbal stim – Not able to obtain any hx from patient. Per mother pt. type 1 DM since age 16. Anorexic for

last 4 days. Meds – Metformin, no insulin. Hx DKA 3 years ago

- 19:40 – 2L Normal saline
- 21:36 – Labs:
 - CBC – WNL
 - Lytes – K+ = 4.6, serum bicarb = 9
 - BUN/creat = 32/1.6
 - Glucose = 663
 - Acetone = Moderate
 - UA – WNL
- ABG
 - pH = 7.11
 - pCO₂ = 16
 - pO₂ = 152
- 20:37 – Regular insulin 8 units IV
- 20:50 – Potassium 20meq IVPB
- 22:34 – Pulse 166, BP decreased to 106/80, sat 98%
- **Diagnosis:** DKA (Diabetic ketoacidosis), Persistent vomiting, Dehydration (hypovolemia)

• Hospital course

- Encephalopathy worsens
- MRI brain normal
- Encephalopathy improves
- Hospital discharge after 4 days

Discussion of Sinusitis and Diabetic Ketoacidosis

DKA is the end result of hyperglycemia and insulinopenia, often precipitated by abrupt withdrawal of exogenous insulin or significant systemic stress.

On her initial visit, our patient was likely careening down a steep slope, made more slippery by her concurrent infection (URI or perhaps acute sinusitis).

When the patient's mother arrived at the second visit, she told the physician there was a history of DKA three years previously.

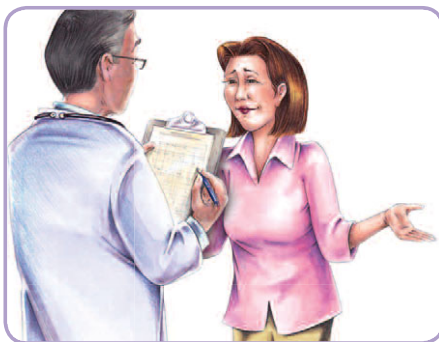
Would a blood sugar check at the initial visit avoided the bounceback?

Acute Bacterial Sinusitis: Management of the Antibiotic-Seeking Patient

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This question is impossible to answer definitively, but likely it would have indicated significant hyperglycemia.

The significant tachycardia reflected at the initial visit was probably from dehydration and a hyperosmolar state. A significantly elevated blood sugar would have prompted lab evaluation and fluid resuscitation. Her lone treatment with metformin (Glucophage) invites further problems, potentially, as patients with renal failure (reflected at the second visit with a creatinine elevation of 1.6, likely from pre-renal causes) puts her at high risk of lactic acidosis. If the sugar was only mildly elevated, she could have been advised to perform frequent blood sugar checks and call her physician or return with significantly elevated blood sugar.

Can DKA be treated on an outpatient basis? What are indications for admission?

Whereas hyperglycemia is treated on an outpatient basis, typically, DKA usually requires inpatient treatment. The trick is to distinguish between the two, especially in patients who are poorly controlled and poorly compliant.

When our patient returned, her blood sugar was >600 mg/dL and her mental status was altered. The initial blood sugar was probably <600 mg/dL, but if it was significantly elevated this could have been further explored historically in the urgent care center by asking about polyuria, polydipsia, weight loss, or history of DKA and per exam by dry mucus membranes, fruity odor of breath (yuck), specific mental status questions, and tachycardia.

Was treatment for sinusitis indicated?

There are specific indications stating that one week of symptoms is necessary before treatment is initiated. Still, most cases are viral and the number needed to treat (NNT) with antibiotics to get one person better sooner is anywhere from 8 to 12.

There are patients who seem to push for antibiotics, but studies have repeatedly shown that speaking with patients about their illness results in equal or higher satisfaction compared with writing a script for unnecessary antibiotics. Physicians commonly order medications because they want to please patients, but we are notoriously poor at gauging a patient's expectations.

This seemingly innocuous practice is rampant, estimated by the Center for Disease Control and Prevention at tens of millions of unnecessary prescriptions per year.

We become real doctors when we not only get the cases our neighbors can diagnose, but when we go to the next step of anticipating a potentially poor outcome and digging deeper to ensure there are no underlying catastrophes lurking around the bend.

There are many known harms of inappropriate use of antibiotics, including allergic reactions, side effects, drug resistance, interaction with other medications, and cost.

Several recent studies have shed light on an additional troubling concern: increased incidence of breast cancer. In 2004, *The Journal of the American*

Medical Association (JAMA) published data on 10,000 women who had used multiple courses of antibiotics over a 17-year period. The findings were troubling; women who had taken a little more than one dose of antibiotics per year had twice the incidence of breast cancer. A Finnish study in 2000 showed similar findings with a similar number of women.

Why do doctors continue to use medicines where there is minimal chance they will help, but significant risk they may cause serious harm? Hypotheses include physician knowledge deficit, time considerations, concern about missing a bacterial illness, and fear of displeasing a patient who had expected their Z-pack.

Summary

We become real doctors when we not only get the cases our neighbors can diagnose (snot=scrip, chest pain=transfer), but when we go to the next step of anticipating a potentially poor outcome and digging deeper to ensure there are no underlying catastrophes lurking around the bend. Identifying a few high-risk patients per day and spending three extra minutes each will go a long way toward avoiding a bounceback. ■

Resources

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