The Trauma Professional's Blog

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Bowel Sounds, Or Just Plain BS?

"Bowel sounds are normal"

How often do you see this on an H&P? Probably a lot more often than they are actually listened for, I would wager. But what do they really mean? Are they important to trauma professionals?

(Un)fortunately, there's not a whole lot of research that's looked at this mundane item. And pretty much all of it deals with surgical pathology (e.g. SBO) or the state of the postop abdomen. Over the years, papers have been published about the basics, and I will summarize them below:

- **Where to listen?** Traditionally, auscultation is carried out in all four abdominal quadrants. However, sound transmission is such that **listening centrally is usually sufficient**.
- **Listen before palpation?** Some papers suggest that palpation may stimulate peristalsis, so you should **listen first**.
- **How long should you listen?** Reports vary from **30 seconds to 7 minutes (!).**
- **Significance?** This is the big question. We're not expecting to find hyperactive or high pitched sounds suggestive of surgical pathology here. Really, we're just looking for **sounds or no sounds**.

But does it make a difference whether we hear anything or not?

Bottom line: In trauma, we don't care about BS! We've all had patients with minimal injury and no bowel sounds, as well as patients with severe abdominal injury and normal ones. We certainly don't have time to spend several minutes listening for something that has no bearing on our clinical assessment of the patient. Skip this unnecessary part of the physical exam, and continue on with your real evaluation!

Reference: A critical review of auscultating bowel sounds. Br J Nursing 18(18):1125-1129, 2009.

Inside This Issue

Trauma Calendar of Events

Western Trauma Association Annual Meeting
Location: Telluride, Colorado
Date: March 1-6, 2015

Trauma, Critical Care & Acute Care Surgery 2015
Location: Caesar's Palace, Las Vegas, Nevada
Date: March 23-25, 2015

Tired Of Waiting For The Ambulance To Arrive With Your Trauma Patient?

When trauma patients are enroute to the hospital, accurate arrival times are crucial. If the patient arrives later than announced, the trauma team waits and wastes time. If the patient gets there early, it's really a form of undertriage and they may not be able to immediately get the critical services they need. A Portland study noted that more than half of transport

time estimates were off by at least 10 minutes, and over a quarter were wrong by 10 minutes or more! Surely there must be a way to predict transport time more accurately!

Harbor-UCLA Medical Center developed a simulation using transport data from a single Oregon county for an entire year. Their goal was to determine the factors that influenced transport time and develop a Google Maps application that would be more accurate than current estimates. Route mapping software was used, with inclusion of variables such as patient demographics, use of lights and siren, time of day, and weather. Individual variables that were statistically found to be insignificant were removed, one at a time, until the best model was derived.

Nearly 50,000 transports were analyzed to create the Google Maps application. Check out the bottom of the page to see what it looks like.

And here are the interesting factoids:

- Without a model, baseline accuracy was only 16% within 5 minutes of predicted
- Transport times were longer during daytime and rush hour (gee!)
- Shorter times occurred with use of lights and siren (gee whiz!)
- Age, sex, wet roads, and trauma system entry had no effect on times
- Use of the model within the Google Maps app increased accuracy to 73% within 5 minutes.
  - Use of lights and siren boosted the accuracy to 78%

Bottom line: Yes, it is possible to enhance the accuracy of arrival predictions of your ambulances. This method should be adopted everywhere! Not only can it improve trauma team use and trauma patient treatment, it can improve ED resource usage for any incoming patient.

Reference: Predicting Ambulance Time of Arrival to the Emergency Department Using Global Positioning System and Google Maps. Prehospital Emergency Care 17(4):458-465, 2013.

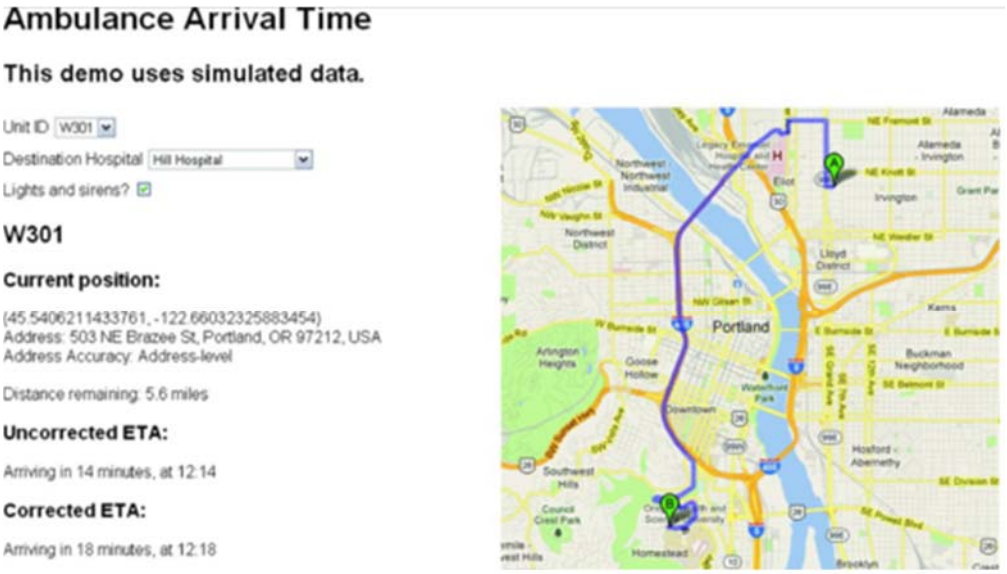
But The Radiologist Made Me Do It!

The radiologist made me order that (unnecessary) test!

I've heard this excuse many, many times. Do these phrases look familiar?

1. … recommend clinical correlation
2. … correlation with CT may be of value
3. … recommend delayed CT imaging through the area
4. … may represent thymus vs thoracic aortic injury (in a 2 year old who fell down stairs)

Some trauma professionals will read the radiology report and then immediately order more xrays. Others will critically look at the report, the patient's clinical status



and mechanism of injury, and then decide they are not necessary. **I am firmly in the latter camp.**

But why do some just follow the radiologist's suggestions? I believe there are two major camps:

- Those that are afraid of being sued if they don't do everything suggested, because they've done everything and shouldn't miss the diagnosis
- Those that don't completely understand what is known about trauma mechanisms and injury and think the radiologist does

Bottom line: The radiologist is your consultant. While they are good at reading images, they do not know the nuances of trauma. Plus, they didn't get to see the patient so they don't have the full context for their read. First, talk to the rad so they know what happened to the patient and what you are looking for. Then critically look at their read. If the mechanism doesn't support the diagnosis, or they are requesting unusual or unneeded studies, don't get them! Just document your rationale clearly in the record. This provides best patient care, and minimizes the potential complications (and radiation exposure) from unnecessary tests.

What Is A Wide Mediastinum Anyway?

Trauma professionals are always on the lookout for injuries that can kill you. Thoracic aortic injury from blunt trauma is one of those injuries. Thankfully, it is uncommon, but it can certainly be deadly.

One of the screening tests used to detect aortic injury is the old-fashioned chest xray. This test is said to be about 50% sensitive, with a negative predictive value of about 80%. However, the sensitivity is probably decreasing and the negative predictive value increasing due to the rapidly increasing number of obese patients that we see.

A wide mediastinum is defined as being > 8cm in width. In this day and age of digital imaging, you will need to use the measurement tool on your workstation to figure this out.

Unfortunately, it seems like most chest xrays show wide mediastinum these days. What are the most common causes for this?

- **Technique**. The standard xray technique used to reduce magnification of the anterior mediastinum (where the aortic arch lives) is a tube distance of 72 inches from the patient, shot back to front. We can't do this for trauma patients because we can't stand them up and are reluctant to prone them. The standard trauma room technique is 36 inches from the patient shot front to back. This serves to magnify the mediastinal image and make it look wide.
- **Obesity**. The more fat in the mediastinum, the wider it looks. The more fat on the back, the further the mediastinum is from the xray plate and the greater the magnification.
- **Other mediastinal blood.** Major blunt trauma to the chest can cause bleeding from small veins in the mediastinum, making it look wide.
- **Thymus**. Only in kids, though.
- **Aortic injury.** Last but not least. Only a few percent of people with wide mediastinum will actually have the injury.

Bottom line: If you encounter a wide mediastinum on chest xray in a patient with a significant mechanism for aortic injury, then they should be screened using helical CT.

To Probe or Not To Probe: Penetrating Wounds

There is considerable variability in the way that penetrating wounds are approached. Some are located over areas of lesser importance (distal extremities) or are so superficial that they obviously don't fully penetrate the skin.

Unfortunately, some involve high-value structures (much of the neck and torso), or are too small to tell if they penetrate (ice pick injury). How should these injuries be approached?

Too often, someone just probes the wound and makes a pronouncement based on that assessment. Unfortunately, there are major problems with this technique:

- The tract may be too small to appreciate with a finger or even a cotton-tip swab

- The tract may be oriented in an unexpected direction, or the soft tissues may have moved after the penetration occurred. In this case, the examiner may not appreciate any significant depth to the wound.
- Inserting an object may violate a structure that you wish it hadn't (resulting in a hissing sound after probing a chest wound, or a column of blood after probing the neck)

A better way to approach these wounds is as follows:

- **Is the patient unstable?** If so, you know the penetration caused the problem and the patient belongs in the OR.
- **Is there other evidence of deep injury, such as peritonitis with a penetrating abdominal wound?** If so, the patient still needs to go to the OR.
- **Do a legitimate local wound exploration.** This entails making the hole bigger with a knife, and using surgical instruments and your eyes to find the bottom of the tract. Obviously, there are some parts of the body where this cannot be done, such as the face, but they probably don't need this kind of workup anyway.

As one of my mentors, John Weigelt, used to say, "Doctor, do you have an eye on the end of your finger?" In general, don't use anything that doesn't involve an eyeball in your local wound explorations!

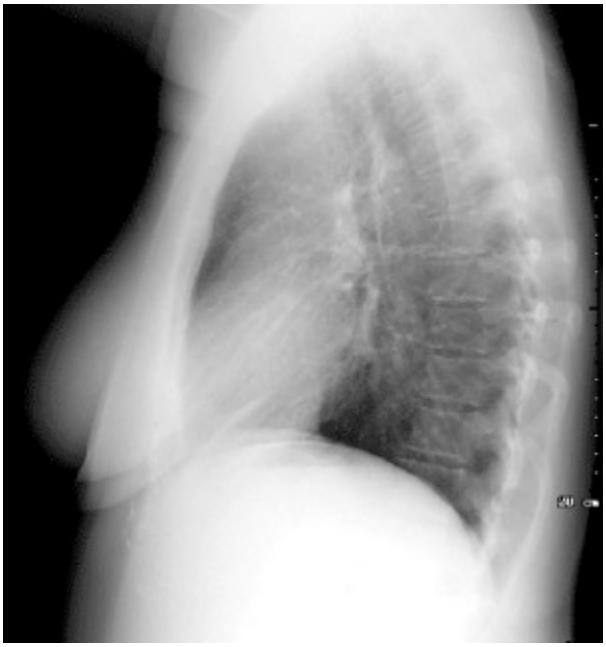
Don't Get Lateral View Chest Xrays to Diagnose Pneumothorax

Pneumothorax is typically diagnosed radiographically. Significant pneumothoraces show up on chest xray, and even small ones can be demonstrated with CT.

Typically, a known pneumothorax is followed with serial chest xrays. If patient condition permits, these should be performed using the classic technique (upright, PA, tube 72" away). Unfortunately, physicians are used to ordering the chest xray as a bundle of both the PA and lateral views.

The lateral chest xray adds absolutely no useful information. The shoulder structures are in the way, and they obstruct a clear view of the lung apices, which is where the money is for detecting a simple pneumothorax. The xray below is of a patient with a small apical pneumothorax. There is no evidence of it on this lateral view.

Bottom line: only order PA views (or AP views in patients who can't stand up) to follow simple pneumothoraces. Don't fall into the trap of automatically ordering the lateral view as well!Patients who went to the OR first tended to have similar injury severity but were sicker than the angio alone group. Crystalloid and blood resuscitation volumes were significantly higher in the OR group as well. Most of these patients underwent a laparotomy, and 64% had active intra-abdominal bleeding. None died in OR, and most were left with a damage control abdominal closure.



Worthless! You'll *never* see it!