

Trauma MedEd

How Long Does VTE Risk Last In TBI?

Most trauma patients are considered to be at some risk for deep venous thrombosis (DVT) and/or venous thromboembolism (VTE) during their hospital stay.

Trauma professionals go to great lengths to screen for, prophylax against, and treat these problems. One of the tougher questions is, how long do we need to worry about it? For fractures, we know that the risk can persist for months. But what about head injury?

A group at Brigham and Women's Hospital did a large database study looking at the VTE risk in adults who sustained significant head injury, with only minor injuries to other body regions. They tried to tease out the risk factors using multivariate regression models.

Here are the factoids:

- Patients were only included if their AIS Head was ≥ 3 , and all other AIS were < 3
- Of the over 50,000 patients in the study, overall incidence of VTE was 1.3% during the hospital stay, and 2.8% overall within 1 year of injury
- Risk factors for VTE after discharge included age > 64 (3x), discharge to a skilled nursing facility (3x), and prolonged hospital length of stay (2x)

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TRAUMA CALENDAR OF EVENTS

EASTERN ASSOCIATION FOR THE SURGERY OF TRAUMA

LOCATION: JW MARRIOTT, SAN ANTONIO, TEXAS

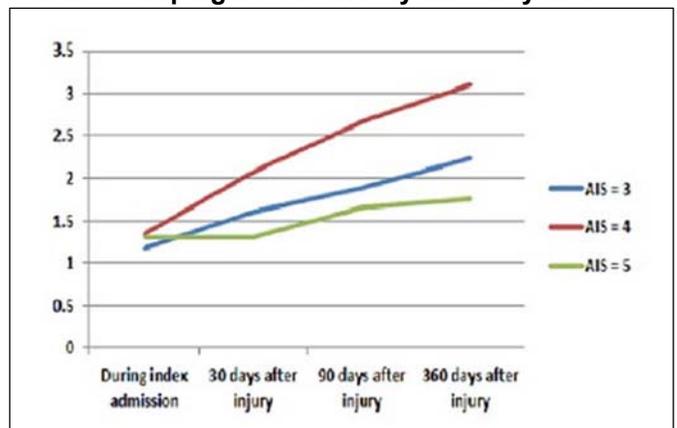
DATE: JANUARY 12-16, 2016

PEDIATRIC TRAUMA CONFERENCE – CHILDREN'S HOSPITAL OF THE KING'S DAUGHTERS

LOCATION: NORFOLK WATERSIDE MARRIOTT, NORFOLK, VIRGINIA

DATE: MARCH 11-12, 2016

Bottom line: View this paper as a glimpse of a potential unexpected issue. The risk of VTE persists for quite some time after head injury (and probably in most other risky injuries like spine and pelvic fractures. The three risk factors identified seem to identify a group of more seriously injured patients who do not return to their baseline soon after injury. We may need to consider a longer period of screening in select patients, but I believe further work needs to be done to help figure out exactly who they are.



Incidence of VTE over time

Reference: How long should we fear? Long-term risk of venous thromboembolism in patients with traumatic brain injury. EAST 2016 Oral abstract #28.

Measuring Volume Status Using Jugular Ultrasound

We're getting pretty handy using ultrasound at the bedside to tell us some interesting things. It started with FAST exams in the ED. Then we added a few views and came up with the Extended FAST, which was helpful in showing potential chest pathology.

Ultrasound made its way into other areas of the hospital, and is now used routinely to place IV lines, arterial lines, and central venous catheters. I've previously written about using ultrasound to evaluate volume status by imaging the IVC in the abdomen. And now, the group at Shock Trauma in Baltimore is trying to reach even further.

They are now using IVC variations and cardiac stroke volume variations to assist in volume assessment in critically ill patients. These studies have a learning curve, especially the stroke volume calculations. They performed a study that evaluated another possible window into the patient's volume status, the positional internal jugular change.

The diameter of the IJ was evaluated while the patient was flat, and again when the head was elevated to 90 degrees. A fluid bolus was given, and the positional change in diameter was measured again. The results were then correlated with changes in measured stroke volume of at least 10%.

Here are the factoids:

- This prospective, observational study involved 159 patients over 1.5 years
- Positional IJ diameter change was much better than IVC diameter changes (receiver operating characteristic areas of 0.93 vs 0.67)
- The authors tried to use the stroke volume variation during passive leg raise (odd, but doesn't involve sitting the patient up), and concluded they could not accurately assess it. This arm of the study was abandoned.

Bottom line: Leave it to the folks at Shock Trauma to come up with more weird yet interesting stuff. This is very preliminary data, and their analysis is ongoing. Any application of this study will be somewhat limited, since many patients are not allowed to sit up due to their injuries or baseline hemodynamic status. We will see where this

technique ends up: in our armamentarium, or in the trash heap.

Go for the jugular: assessing volume responsiveness in critically ill surgical patients. EAST 2016 Oral abstract #32.

(F)utility Of Antibiotic Use In Facial Fractures

The majority of trauma patients presenting with facial fractures are managed without surgery. Dogma in the facial fracture literature indicates that antibiotics should be administered for some period of time, typically 7-10 days, for fractures that involve one of the sinuses.

Although this idea and practice have been around for a long time, there is no good literature out there to support it. Most medical professionals are now aware of the downside to giving unnecessary antibiotics, including allergic reactions, C. Diff infections, and promotion of antibiotic resistance.

A group at Geisinger Medical Center in Danville, PA, performed a four-year retrospective review of their registry data involving nonoperatively managed facial fractures. They stratified their patients into three groups: no antibiotics, brief antibiotics (1-5 days), and prolonged antibiotics (>5 days). A total of 289 patients were studied.

Here are the factoids:

- 17% received no antibiotics, 22% received a short course, and 61% got them for more than 5 days (!)
- There were no soft tissue infections in any of the groups
- There was 1 C. Diff infection, which occurred in the prolonged antibiotic group. This was not statistically significant.

Bottom line: Granted, this was a small, retrospective study. But absolutely no difference in soft tissue infections was seen, and fear of infection is the usual justification for the use of antibiotics in these patients. A single case of C. Diff colitis was noted, and it just happened to occur in the prolonged antibiotic group. It's time that we consider abandoning the blanket use of antibiotics for facial fractures involving the sinuses.

Reference: Utility of prophylactic antibiotics for non-operative facial fractures. EAST 2016 Poster abstract #11.

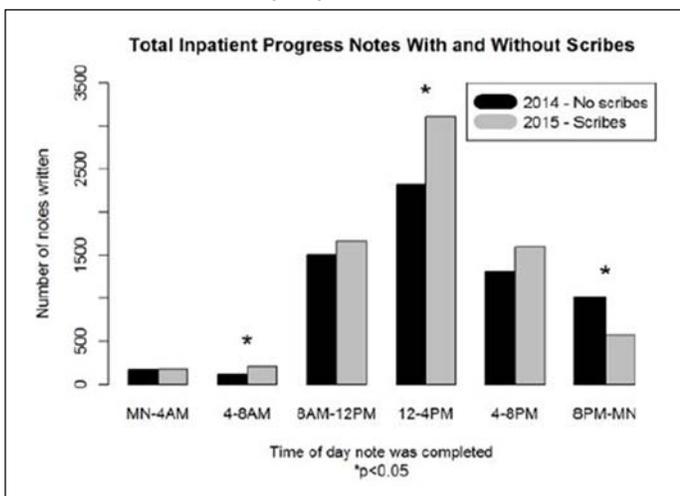
Use Of Scribes To Increase Charge Capture

Ugh! What have we come to? And don't get me started regarding the electronic medical record. It is true, **the burden of documenting what we do in order to get paid continues to increase**. And, of course, this takes time. And we don't get paid for the time we spend doing this documentation.

The next logical step? Hire cheap labor to do the documentation! This is becoming a fairly common practice, unfortunately. The next abstract is from MetroHealth in Cleveland. They looked at the impact of hiring scribes from both time and money standpoints. Two five-month periods were reviewed, with and then without scribes. Hold on, the numbers here will make your head spin!

Here are the factoids:

- A total of 9726 notes were written in the no-scribe period, and 10933 were written with scribes
- Despite the fact that there were 407 fewer patient-days during the scribe period, 882 more inpatient notes were written
- More progress notes were written early in the day with scribes, and fewer were written during the evening hours
- The number of notes written after patient discharge decreased from 12.7% to 8.4% when using scribes
- Charge capture increased by \$32 per patient-day (!)
- The additional scribe notes resulted in an extra \$316K in charges generated



Bottom line: It's just so annoying to think that we actually have to stoop to something like this. The scribes cost this program about \$33K. They generated \$316K. The paper estimates that they were actually paid about 20% of this, or \$63,000. So each of the eight trauma surgeons in this program collected an extra \$8,000 over the 5-month period.

So, is it worth it? Maybe. The extra charges collected seem insignificant. But, if the surgeon is actually able to dedicate less time to documenting, and this allows them to spend more time operating (which is what really pays the bills), then perhaps it is. I'm not easily convinced, though.

Reference: Trauma surgeons save lives – scribes save trauma surgeons! EAST 2016 Poster abstract #16.

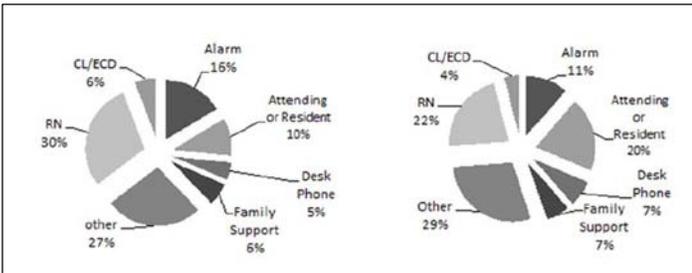
Nursing Interruptions In The SICU

A few papers have been published in the nursing literature about the detrimental effects of interruptions experienced during patient care. Unfortunately, these papers have never taken the next step to determine why they occur, and what steps can be taken to decrease the frequency of this problem.

A group at Wright State in Dayton OH tried to tease apart the various aspects of this issue. They observed registered nurses in a 23 bed SICU at a Level I trauma center. A total of 25 sessions covering 75 hours and multiple nurses were analyzed for the cause and duration of any interruption, and whether it caused a switch from their primary task.

Here are the factoids:

- Nurses were interrupted **every 18 minutes** on average
- The dominant location was in the patient room (58%), and the most common activity interrupted was documentation
- Interruption by an attending or resident was less frequent (10%), but ended up being longer than interruptions by other nurses (3 mins vs 1 min)
- Interruptions of longer duration more commonly caused the nurse to switch tasks



Frequency (left) and duration (right) of interruptions from each source. CL = call light, ECD = electronic communication device

Bottom line: This is a first look at the anatomy of nursing interruptions in the SICU. They are much more common than you think. Task switching (either mentally or physically) is something that humans do poorly. It always degrades performance, and can ultimately lead to patient harm. Hopefully, operational protocols can be developed to protect nurses from unnecessary or non-urgent interruptions to improve quality of care.

Reference: *The anatomy of nursing interruptions in a surgical intensive care unit at a trauma center. EAST 2016 Poster abstract #18.*

Pain And Tourniquet Efficacy

Ischemia hurts. And tourniquets induce ischemia on purpose. So logically, tourniquet application should hurt. In a hospital setting, Doppler ultrasound is used to confirm loss of arterial inflow to the extremity. In the field, the usual end point is cessation of bleeding. The idea is to stop tightening the moment that bleeding stops. Unfortunately, this is not very exact. So the next question is, can pain after tourniquet application be used to predict how well it is working?

The group at Cook County in Chicago measured pressures, arterial occlusion, and pain in various extremities in a group of healthy volunteers (!!). Fortunately for them, complete occlusion was only maintained for a minute.

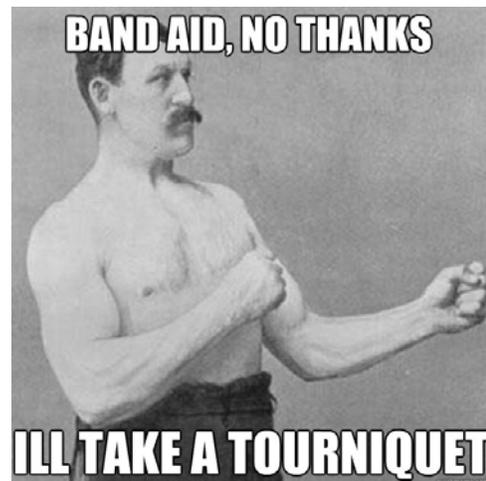
Here are the factoids:

- Three tourniquet systems were used: an in-hospital pneumatic tourniquet, the CAT™, and the SWAT™

- Readings were taken on left and right upper arms, the forearms, legs, and the right thigh
- Using a pain scale of 0-10, tourniquet application did not generally induce severe pain
- Pain scores were 1-3 in the upper arms and forearms, 3-4 in the thigh, and 2-3 in the leg

Bottom line: Strangely enough, tourniquet application did not produce severe pain in any of the subjects. Thigh application tended to be more painful. But, generally speaking, pain cannot be used as an indicator of effective application. In the field, cessation of bleeding is the best indicator. And in the hospital, Doppler ultrasound confirmation should be the standard. In any case, if the patient is experiencing undue pain after application, check the tourniquet and its positioning. Something else might be wrong!

Reference: *Pain is an accurate predictor of tourniquet efficacy. EAST 2016 Poster abstract #23.*



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