The Trauma Professional's Blog

Trauma MedEd

Emphasis: Protocols – Part 2 Subscribe: www.TraumaMedEd.com April 2013

More Protocols!

This issue is the second of two dedicated to **protocols**. Last month I published guidelines for the CIWA protocol, an ED extubation protocol, TBI screening guidelines and a protocol for imaging your blunt trauma patients.

As before, the development of guidelines and protocols must be customized. Every hospital has its own set of resources, and your final guidelines must reflect that.

Once again, I'll be making use of QR codes and URL shorteners. **In order to use the QR codes, you must have a QR reader on your handheld device.** These are available for all operating systems and all device sizes (phone, tablet, etc). Just snap the code, and the pdf file for the protocol will load. You can save it or email it so that it can be opened on other platforms.

The web URLs were created using the URL shortening service bit.ly. Instead of having to type in a ridiculously long and potentially misspelled address, the URL is very short. However, the letters found after the **http://bit.ly/** portion are case sensitive, so be sure to capitalize the appropriate letters.

Chest Tube Management

I've written a lot about chest tubes, and there's actually a lot to know. And there is a fair amount of misinformation as well. Here's some info you need to be familiar with:

- **Chest trauma generally means there is some blood in the chest.** This has some bearing on which size chest tube you choose. Never assume that there is only pneumothorax based on the chest xray. Clot will plug up small tubes.
- **Chest tubes for trauma only come in two sizes: big (36Fr) and bigger (40Fr).** Only these large sizes have a chance in evacuating most of the clot from the pleural space. The only time you should consider a smaller tube, or a pigtail type catheter, is if you know for a fact that there is no blood in the chest. The only way to tell this is with chest CT, which you should not be getting for diagnosis of ordinary chest trauma.
- **When inserting the tube, you have no control of the location the tube goes once you release the instrument used to place it.** Some people believe they can direct a tube anteriorly, posteriorly, or anywhere they want. They can't, and it's not important (see next tip).
- **Specific tube placement is not important, as long as it goes in the pleural space.** Some believe that posterior placement is best for hemothorax, and anterior placement for pneumothorax. It doesn't really matter because the laws of physics make sure that everything gets

Inside This Issue

Trauma Calendar of Events

Atlanticare Regional Medical Center Trauma Symposium
Place: Bally's Hotel & Casino, Atlantic City, NJ
Date: May 20-22, 2013

Austin Trauma & Critical Care Conference
Place: AT&T Executive Education & Conference Center
Date: May 30-31, 2013

sucked out of the chest regardless of position except for things too big to fit in the tube (e.g. the lung).

- **Tunneling the tube tract over a rib is not necessary in most people.** In general, we have enough fat on our chest to ensure that the tract will close up immediately when the tube is pulled. A nicely placed dressing is your insurance policy.
- **Adhere to an organized tube management protocol to reduce complications and the time the tube is in the chest.**

The QR code and URL below will provide a copy of the chest tube management protocol at Regions Hospital.

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/obkdd0

Solid Organ Injury

Nonoperative management of solid organ injury is about 25 years old now. Our thinking about the specifics of this type of management has been all over the map. The Eastern Association for the Surgery of Trauma (EAST) developed a set of practice guidelines for spleen injuries 10 years ago, and finally updated them last year. Liver guidelines are similar. Here is a summary of the current status of the spleen guidelines:

Level I recommendations (best quality data):

- Patients with peritonitis or who are hemodynamically unstable should be taken immediately to the OR

Level II recommendations (good data):

- Laparotomy is not indicated in isolated spleen injury if stable and peritonitis is not present
- Age, neurologic status, grade of injury, amount of hemoperitoneum and age are not contraindications to nonoperative management. Only hemodynamic stability matters.
- CT of the abdomen with IV contrast is the most reliable method to assess severity of spleen injury (my interpretation: in the hemodynamically stable patient)
- Angiography with embolization should be considered if a contrast blush is seen on CT, AAST grade > 3, moderate hemoperitoneum is present, or there is evidence of ongoing bleeding
- Nonoperative management should only be considered if continuous monitoring and serial exams can be carried out at your hospital, and if an operating room is immediately available if needed

Level III recommendations (weak data):

- Clinical status should dictate need and frequency of followup imaging (my interpretation: only do it if the patient condition changes for the worse)
- Contrast blush is not an absolute indication for operation or angio-embolization. Age, grade of injury and presence of hypotension need to be considered. (My interpretation: don't operate or do angio on kids without a really good reason)
- Angio is an adjunct to nonop management in patients who are at high risk for delayed bleeding or to look for vascular injuries (pseudoaneurysms) that may lead to rupture or delayed hemorrhage
- Pharmacologic DVT prophylaxis can be used in isolated spleen injury without increasing failure rate. Optimal timing to start this treatment has not been determined.

This link provides a protocol that incorporates many of the guidelines, but also provides specific management suggestions such as vital signs, labs, time at bed rest, time at NPO, etc.

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/tmMd6x

Reference: Selective, nonoperative management of blunt splenic injury. J Trauma 73(5):S294-S300, 2012.

Rapid Reversal Of Warfarin

A growing number of adults, usually elderly, are taking Coumadin (warfarin) to manage chronic medical conditions or deep venous thrombosis. While warfarin is a very useful drug for these problems, it is notoriously difficult to maintain tight control of INR. If an individual on warfarin is involved in a fall or vehicular crash, bleeding complications can become life-threatening. A recent Journal of Trauma article shows that mortality more than doubles in elderly patient who are admitted awake after just falling from standing.

The key is to rapidly reverse an elevated INR. Vitamin K can be used to increase biological activity of several clotting factors, but this occurs over several hours. Plasma is also used, but there are several considerations. Many hospitals have only frozen plasma, and there may be a delay of 30 to 45 minutes to thaw it. Multiple units may need to be transfused in order to normalize higher INRs, which may cause volume overload in elderly patients with cardiovascular disease.

With the recent FDA approval of 4-factor prothrombin complex concentrate (PCC), an option is now available that involves less volume than plasma infusion. However, this product is considerably more expensive than plasma. Until significant benefit over plasma is shown, PCC is probably best reserved for patients who are volume sensitive (heart disease or failure).

The protocol below is currently in use at Regions Hospital.

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/vN4K0o

Of note, patients who are taking warfarin who sustain a head injury and have a GCS of 14 or 15 do not meet trauma activation criteria. However, they do get point of care INR testing and immediate access to the CT scanner. And patients must meet strict criteria to be discharged home without a followup scan in 12 hours. In reality, nearly all are admitted for observation while they wait for a repeat scan.

Reversal Of Other Anti-coagulants

A number of other drugs are out there besides warfarin. Antiplatelet agents have been around for some time. A host of newer drugs (direct thrombin inhibitors, Factor Xa inhibitors) are now being introduced and heavily advertised. They seem to be convenient, with oral dosing and no followup blood tests. Unfortunately, they cannot be reversed quickly either. They just need a few days to wear off. In the meantime, if the patient has intracranial bleeding from trauma, there is little to be done.

But we have to try something. Here are some guidelines for reversing antiplatelet drugs like aspirin and clopidigrel, as well as dabigatran.

Antiplatelet drugs

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/126glnq

Dabigatran

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/11MnBDg

Massive Transfusion

Massive transfusion is needed in about 3-5% of trauma patients. All Level I and II trauma centers are required to have a massive transfusion protocol. However, the protocol must be triggered in a timely manner to best benefit the major trauma patient.

Trauma surgeons at Vanderbilt validated a simple scoring system that allows accurate prediction of the need for massive transfusion in patients as they arrived in the ED. The system was called the ABC score (Assessment of Blood Consumption). It consists of the following 4 yes/no parameters:

- Penetrating mechanism (0=no, 1=yes)
- ED SBP <= 90 (0=no, 1=yes)
- ED heart rate >= 120 (0=no, 1=yes)
- Positive FAST (0=no, 1=yes)

The results of ABC when applied to trauma patients in the ED was as follows:

ABC Score	% requiring massive transfusion
0	1%
1	10%
2	41%
3	48%
4	100%

This scoring system is simple, easy to use and easy to remember. No laboratory tests are needed, and the information needed can be gathered quickly.

Bottom Line: This is a simple and accurate prediction system for determining the need for massive transfusion in trauma patients. Recommended!

This QR code / link provides a copy of the current Massive Transfusion Protocol for Regions Hospital. It is updated on a fairly regular basis as the literature and our needs change.

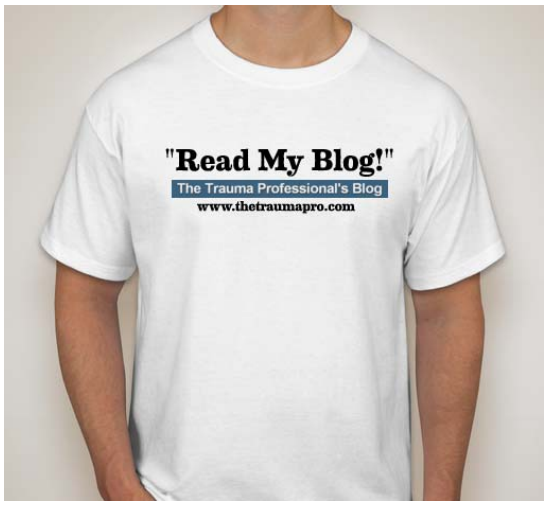
Massive transfusion protocol

Scan the QR code, or
enter this URL in your browser:
http://bit.ly/16aqnIm

Coming Soon? Swag!

A collection of swag for fans of the Trauma Professional's blog is being considered. I've fielded comments and questions about this, with some people in favor and some not. What do you think? And if you are interested, what items and designs do you think would work?

Here is a concept piece that memorializes my most common quote, both on rounds and when I'm visiting other trauma centers. Comments? Email me!



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