OhioHealth

Emergency Medical Services

Fall 2020

Stopping bleeds at speed: Using TEG to Resuscitate Bleeding Patients at OhioHealth

Hemorrhage is the most common cause of preventable death in trauma patients. Bleeding patients often enter the physiologic state of shock, bringing on symptoms like hypotension, tachycardia and altered mental status.

Generally, bleeding takes on two forms: surgical bleeding and medical bleeding. Surgical bleeding can be controlled with direct compression, tourniquets or surgery. Medical bleeding occurs when blood is unable to clot at the level of exposed micro vessels and capillaries. When a patient enters a state of shock, metabolic derangements will lead to trauma-induced coagulopathy and result in medical bleeding. Without appropriate levels or functioning of platelets and clotting factors contained within plasma, the patient will continue to bleed from these raw surfaces. Most massive transfusions rely on a fixed ratio of red blood cells, plasma and platelets, but transfusion of too much blood product can lead to pulmonary or immune complications.

Viscoelastic assays, often referred to as TEG (thromboelastography) or ROTEM (rotational thromboelastometry), provide comprehensive whole blood hemostasis testing. TEG can identify the speed and strength of clot formation and reveal coagulopathies related to coagulation factors, platelet function and fibrinolysis in real time. Clinicians can use these results to provide a balanced resuscitation, and only transfuse exactly what the patient needs at the time they need it. Unlike classic coagulation assays, like international normalized ratio (INR), TEG does not measure specific levels of factors. Instead, it takes direct measurements of the speed and strength with which a clot propagates. TEG can also identify hyperfibrinolysis, which is when blood clot begins to break down too quickly.

If a patient's clot is breaking down too fast, tranexamic acid (TXA) can be administered to slow this down. TXA itself does not reverse shock and should be considered when hyperfibrinolysis is occurring. At OhioHealth trauma centers, we recommend that TXA only be given if hyperfibrinolysis is seen on TEG, or if all other modes of resuscitation are failing. New trials are underway to help reveal the appropriate use of TXA, but the speed with which viscoelastic assays return results has revolutionized resuscitation in the patient with hemorrhagic shock. (View sources.)

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SEE TEG AT WORK

IN THE FIELD

Dan Ellinger
Captain/Paramedic, Prairie Township Fire Department
EMS Coordinator, OhioHealth EMS

From day one, first responders train for any possible situation. From the routine daily calls to an AVI or mass casualty incident, we understand our duties will, and do, change on the fly. Our dispatch messages do not always match our emergency scenes, yet we mitigate situations with relative ease and return to the station to wait for the next call. Prior to COVID-19, I knew our job and did it well. When a shift ended, I would try to leave what I had seen at the station, go home to my family and decompress. During the current COVID-19 pandemic, this routine has drastically changed.

In the beginning of May, we implemented protocols to slow the spread or "flatten the curve." These documents changed daily; keeping up with the most current PPE recommendations proved difficult. We were bombarded with emails, information got lost, leading to some employees questioning daily operations. The fear of exposure led to over-cautious operations which, at times, caused delays in patient care. As time went on, recommendations regarding PPE changed, prompting confusion and complacency about PPE. Exposures, positive tests and quarantines are now part of our reality.

As I mentioned before, home used to be my place to get away … not anymore. Avenues I'd normally use to relieve job-related stress have been cut off by social distancing, masks, lockdowns and home-schooling. The stressors of work are now compounded by stressors at home, and I quickly discovered I needed to find new ways to decompress.

I have found an outlet in yoga. Yes, yoga. I realize it's a bit out of character for me, but I find the physical and mental practices of yoga help me achieve a positive state of mind, while allowing me to let go of old behavior patterns. As an officer, I have implemented morning yoga into our daily routine at the station. Some have embraced it, and for others it's an acquired taste. The point is, we are all experiencing new pressures. In order to deal with them in a positive way, we must be humble enough to acknowledge them, and strong enough to act on them!

CASE STUDY

Drug Abuse and Myocarditis

See how intravenous drug use takes a toll on the heart, causing an infection that can be difficult to treat in difficult patients.

READ MORE

EDUCATION CALENDAR

COVID-19 has presented many challenges for our EMS providers trying to obtain continuing education. Please visit OhioHealthEMS.com for a listing of our online education options. If you would like to schedule training via Webex or onsite training, please send a request to EMS@ohiohealth.com.

ONLINE EDUCATION DETAILS

DIRECTOR'S CORNER

OhioHealth Trauma Care 2020 Conference

Holly Herron, DNP, RN, CNP
System Director
OhioHealth EMS

We are happy to announce the annual OhioHealth Trauma Care 2020 Conference will continue this year. The conference has been converted to a virtual setting due to COVID. The dates for the conference are November 16 –17, from 8:30 a.m. to 1 p.m. Here are this year's topics and speakers.

There is no cost for nonphysicians. There will be 5.25 CE awarded for this event. Due to the virtual nature of the conference, the awards and patient journey will be separate and will be posted on the EMS Blog.

REGISTER TODAY

FAST FACTS

Seatbelt sign injuries to consider

Stacey Wickham BSN, RN, CCRN
OhioHealth Senior Consultant Trauma Outreach

1. Blunt vascular injury in neck.

2. Internal abdominal injuries, including solid organ injuries.

3. Cardiac contusion.

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SERVICE LINE FEATURE

Field Needle Decompression – When and How?

Marco J. Bonta, MD, MBA, FACS
Trauma Medical Director, OhioHealth Riverside Methodist Hospital

Tension pneumothorax is seen in almost 5% of patients with major trauma, and it is a time-sensitive surgical emergency for which prehospital providers have an opportunity to save a life. Historically, we have felt that the second intercostal space in the mid-hemithoracic line is the preferred location, but there is growing evidence that there are alternatives. Here are some fast facts:

- Some reports suggest many patients who underwent field decompression had no tension pneumothorax, so we should be judicious about its use and consider tube thoracostomy following rapid transport if the patient is not in extremis.
- Other problems can act like tension pneumothorax in the prehospital setting, including diaphragmatic rupture or hernia.
- There are severe potential complications of field decompression, including cardiac or major vascular injury, pulmonary laceration, and the creation (not treatment) of a pneumothorax.
- Advanced Trauma Life Support (ATLS) continues to endorse midclavicular placement in the second intercostal space.
- Lateral placement in the fourth or fifth intercostal space in the mid or anterior axillary line may be a better and safer location, partly because our standard 5 centimeter angiocatheters placed in the upper chest may not be long enough to reach the pleural space.

Our current recommendation is that prehospital providers should become aware of the newer recommendations and talk with their medical directors about what is best for their patients. (View sources.)

Please visit OhioHealthEMS.com for more information about our EMS programs.