SIMULATION EXERCISE

Curriculum Topic/Title: Massive Hemorrhage Protocol case #2: GI BLEED
Developed by: Dr. Jordan Tarshis
Creation/Modification Date: 2020-Jun-18

Learning Objectives:

1. Demonstrate safe and proficient management of an adult patient with injury and significant bleeding.

2. Recognize need for massive hemorrhage protocol (MHP) and demonstrate ability to activate an institutional protocol

3. Achieve high performance in situational awareness, teamwork and communication in a simulated setting.

4. Identify areas of improvement and develop a plan.

References / Review Articles:

Callum JL, Yeh CH, Petrosoniak A et al. A regional massive hemorrhage protocol developed through a modified Delphi technique. CMAJ Open 2019; 7:E546–E561.

PATIENT & SCENARIO INFORMATION FOR FACILITATORS

Patient Name: VANESSA TYRONE

Patient Info: PMH, current problem/procedure, meds, allergies:

64 y.o. woman admitted with pancreatitis secondary to EtOH. Known liver cirrhosis (moderate, Child-Pugh B). Not on any regular medications, no allergies.

Location / Setting: Acute care inpatient unit appropriate for site

EQUIPMENT FOR EXERCISE:

Comments:

- This exercise does NOT require a high fidelity mannequin, but could be used with one
- A method to communicate vital signs is required. Options include:
  - » Whiteboard or paper-based technique
  - » Tablet-based technique using app based software (example SimMon on and iPad)
  - » Software from high-fidelity mannequin

Monitors required:

Available	On patient		Available	On patient	
☐	☒	NIBP	☒	☐	ECG
☒	☐	Arterial line	☒	☐	Temperature
☒	☐	CVP	☐	☒	Pulse oximeter
☐	☐	PA Catheter	☐	☐	Capnograph
☐	☐	Fetal heart monitor	☐	☒	IV (primary)
☒	☐	Urinary catheter	☒	☐	Secondary IV

Other equipment required:

- Equipment that would normally be available in this clinical area per institutional protocols should be available for this simulation.

Simulation Video

A video based on this exercise script is also available for training purposes. Available at this link: https://transfusionontario.org/en/category/massive-hemorrhage-protocol/simulation-videos/

Supporting Files (assessment, labs, imaging, etc):

1. Q1h lab results
2. Observational tool
3. Debrief guide
4. Participant evaluation form available at:

Scenario Content:

Information for Learner:

(place on a separate page as we often give them this 'stem' to read, along with the anesthetic record / supporting documents if appropriate)

A 64 y.o. woman was admitted 2 days ago with pancreatitis secondary to ethanol. She has known alcohol use disorder and had moderate liver cirrhosis. She has known varices for which she was prescribed beta-blocker (but she has been non-compliant). Her INR on admission was 1.8 on admission and platelet count 78. She does not take any regular medications at home, and has no allergies. She is being treated now with IV fluid for hydration, hydromorphone IM for analgesia and supportive care. Her last CBC taken on admission showed a macrocytic anemia with a Hb of 97.

30 minutes ago she vomited a large amount of fresh red blood. Her vital signs are currently BP 82/45, HR 125 sinus, SpO2 98% on room air, GCS is 15. As you arrive by the bedside she vomits up an additional large amount of fresh red blood.

Additional Information for Instructor only, including:
Roles of confederates or other participants
Type of HELP available:

Instructor / Leader of this exercise will pre-determine the number and nature of respondents corresponding to realistic local resouce availability

Simulator Setup and Programming Notes:

One facilitator (not the leader) should be assigned to dissemination of current vital signs throughout the simulation. This individual should have sufficient medical knowledge to be able to alter the vital signs in a realistic fashion in response to events as they occur during the simulation.

Baseline Simulator Physiologic State (leave blank if not relevant):

HR: **125**   BP: **82/45**   RR: **24** SpO_2: **98**

Weight: **45 kg**   BMI: **18**

Neuro (LOC, orientation etc.): **GCS 15**

Respiratory: **spontaneous respirations**

Progress During Scenario: **Patient becomes more tachycardic and hypotensive, but responds to fluids and blood products in a realistic fashion**

Laboratory, Radiology, or other relevant information, available initially or as the scenario progresses:

Key Processes During MHP Simulation
T7 Framework

- Triggering
- Team
- Testing
- Tranexamic Acid
- Temperature
- Transfusion
- Termination

Discussion and Teaching Points for Debriefing:

- Minimum of 2 facilitators required, preferably interprofessional
- Notes should be taken during the scenario to identify processes well done and areas of improvement
- Team debriefing is required, with focus on system improvement and not individual performances

Post Simulation Activities:

- One or more individuals must, a priori, be tasked with compiling a summary from each simulation including areas for system improvement, individual(s) responsible for addressing the issues identified during the simulation
- This process should become part of the routine quality and safety processes at the institutional level
- Follow up, and repeat simulations are mandatory, as a single intervention without follow up will not lead to any improvement in patient care

1.   q1h lab results from simulation #2

VERSION 1		
Lab work	On arrival	60 minutes
Hemoglobin (g/L)	97	72
Platelets (x10^9/L)	78	58
INR	1.8	2.2
Fibrinogen (g/L)		1.6
Lactate		3.0
PH		7.34
Blood products administered	1 unit RBC	1 unit RBC 1 pool platelets 2 units FFP
Vital signs BP Temperature	 81/43 Not measured	 84/47 Not measured

VERSION 2		
Lab work	On arrival	60 minutes
Hemoglobin (g/L)	97	65
Platelets (x10^9/L)	78	58
INR	1.7	2.3
Fibrinogen (g/L)		1.0
Lactate		3.0
PH		7.34
Blood products administered	4 units RBC + 1 pool platelets (based on low count) 2 units FFP	1 pool platelets 4g Fibrinogen Concentrate
Vital signs BP Temperature	 84/47 36.5	 93/52 36.5

MASSIVE HEMORRHAGE PROTOCOL DEBRIEFING GUIDE – GI BLEED SCENARIO

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Notes:

- The intent is to display this video to the intended audience as a group. A facilitator with content expertise will be present to lead the discussion after the video is viewed.
- The facilitator should inform the audience that the people in the video have consented to be observed, and that their performance in the video was scripted and does not reflect how they would perform with a real patient.
- This teaching session could be done in person or virtually. It is intended to be done with synchronous learning, and the facilitator should endeavour to provide an interactive session with audience participation.
- This video contains 2 versions: version 1 is managed with intentional gaps in quality of care, and allows the group to discuss how the management shown here could be improved. Version 2 is the same scenario managed better.
- Version 1 should be watched first and the video stopped after this scenario. A discussion will ensue. After this discussion, the video can be re-started and version 2 watched and discussed.
- The audience should have the observation tool in front of them as they watch the video. They should be encouraged to make notes and observations and be prepared to discuss the scenario after watching.
- Evaluation forms of this session should be completed by all participants at the end of the session.

A comment on TXA

While TXA is a component of an MHP, the use for patients with gastrointestinal bleeding is controversial. The HALT-IT trial, published in 2020 (Reference: Lancet 2020;395:1927-36) is a large international randomized placebo-controlled trial that enrolled 12,000 subjects with a GI bleed. The treatment group received 1 g TXA over 10 minutes followed by 3g TXA over the next 24 hours.

There was no difference in the outcome of death due to bleeding within 24 hours, 5 days or 28 days. There was no difference in the risk of arterial thromboembolic events, but there was a significant difference in the risk of venous thromboembolic events (RR 2.11, 95% CI 1.25-3.59), with a suggestion of higher risk in those with suspected variceal bleeding or liver disease.

Recognizing that this is a single trial, that the dose of TXA used was high, and that the patient in this scenario has advanced liver disease, it was decided not to administer TXA in this scenario. The usage and dosing of TXA for an MHP in a GI bleed remains at the discretion of the treating health care team. These comments are intended to guide discussions around this topic and not to dictate management nor standard of care.