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SHORT REPORT

A Novel Multidisciplinary Team Activation for Patients with Severe Gastrointestinal Bleeding: Creation of the Code GI Bleed Protocol

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Abstract: Patients with gastrointestinal (GI) bleeding present to the emergency department (ED) with a wide spectrum of illness severity. Among the most critically ill patients, comorbidities and other risk factors, such as liver disease and anticoagulation, can complicate their management. These patients are resource-intensive to stabilize and resuscitate, often requiring the continuous attention of multiple ED staff members along with rapid mobilization of specialty care. At a tertiary care hospital with the ability to provide definitive care for the most critically ill patients with GI bleeding, we introduced a multi-disciplinary team activation pathway to bring together specialists to immediately respond to the ED. We designed a Code GI Bleed pathway to expedite hemodynamic stabilization, diagnostics, source control, and timely disposition out of the ED to the intensive care unit or relevant procedural area of the hospital.

Keywords: emergency, gastrointestinal bleeding, endoscopy, gastrointestinal hemorrhage, critical care

Introduction

GI Bleeding in the ED

GI bleeding is a common patient complaint in the ED, with over 300,000 annual admissions for both upper and lower sources of bleeding in the United States.[1] Mortality among those at the severe end of the GI bleed spectrum is high, and a multidisciplinary approach is often needed to stabilize and treat the bleeding source.[2] Furthermore, initiation of therapeutic anticoagulation with factor Xa inhibitors eclipsed warfarin in 2014 and is associated with an increased risk of GI bleeding.[3] In-hospital mortality is 7% for patients with GI bleeds taking direct oral anticoagulants and 9.6% among all patients with variceal upper GI bleeding.[4,5] As the incidence of liver disease is expected to increase in the years ahead,[6] we may expect to see more GI bleeding among ED patients.[7] Some novel evidence-based systems approaches may improve care for eligible critically ill patients with GI bleeds, such as the use of an ED-based intensive care unit (ICU).[8] However, even among tertiary care EDs, few have access to an ED-run ICU. As a result, we sought to develop an alternative team-based approach to improve care in this patient population.

Code Teams in the ED

Code teams in the ED (eg, Code STEMI, Code Stroke, Code Trauma, among others) benefit from a multidisciplinary team response in other time-sensitive conditions with a high mortality and disability rate.[9] They have become the standard of care intervention for many of high-risk conditions. For example, current national ischemic stroke guidelines have a IB recommendation for "an organized protocol for the emergency evaluation of patients with acute stroke."[10] To

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our knowledge, this approach has not been previously applied to patients with severe GI bleeding. Team-based activations work best for patients who need significant resources mobilized; these teams are able to expedite diagnostics and treatment, engage multiple specialists, and coordinate patient movement to imaging suites, operating rooms, or other diagnostic and treatment areas outside of the ED. Most code team activations urgently bring key team members together to assess the patient and develop an action plan tailored to the specific patient scenario. Others have extended the code activation concept to other high-risk areas, such as massive pulmonary embolism and patient agitation.[11,12] Hospital and ED crowding, intertwined with a nursing staffing crisis has brought new relevance to the value of minimizing time in the ED and rapidly moving patients to the endoscopy suite or ICU. Furthermore, crowding has been shown to delay care for critically ill patients, even those with code team activations.[13]

Code GI Bleed Protocol Development

Most code team policies are focused on defining patient eligibility, the process for alerting the team, and expectations for team member response. Accordingly, we developed our Code GI Bleed protocol with these elements in mind (see Supplementary Materials). Brigham and Women's Hospital is an urban, tertiary care academic medical center with about 62,000 annual adult ED visits. Of note, we staff a general surgery resident in our ED 24/7; as a result, we chose not to include this role in the page group for the Code GI Bleed activation. We leveraged a collaborative process of bringing together local leaders from emergency medicine, gastroenterology, interventional radiology, acute surgery, emergency radiology and critical care medicine to create the protocol, followed by inservice efforts to educate staff.

Our goal was to create a clear process with unambiguous activation criteria and shared communication and response expectations. We balanced this new code activation team against the risk of creating too many code responses; there are currently 9 code teams activations specific to our ED.[14,15] Code activations must define activation criteria that allow for sufficient alerts to impact patient care while also justifying the governance efforts to create, message, and track them. Interruptions to divert resources toward specific patients may lead to delays for other patients that could impose an unjustified risk if left unchecked. We used an iterative process of stakeholder engagement and serial revisions to the protocol to ensure support from all parties.

Protocol Implementation

We implemented the protocol via a series of inservice teaching sessions among each of the clinical groups with a role in the protocol. We also host the protocol on the ED's intranet website, where all important clinical documents are warehoused. We directly link this website from the main track board of our electronic medical record.

Following staff education, we plan to track key metrics to help establish the value of the protocol. Process metrics include activation frequency, case reviews, retrospective audits, ED length of stay, time to source control, time to anticoagulant reversal administration, time on vasopressors (if used), time to blood product administration, and the amount of blood products required.[16,17] We will also track the outcome metrics of in-hospital patient mortality and incidence of pulseless electrical activity cardiac arrest with return of spontaneous circulation. Finally, we plan on an economic analysis to evaluate the financial benefit of protocol usage versus matched controls.[18]

Next Steps and Future Directions

Post-implementation we will solicit staff feedback and investigate expanding the code team membership (eg, the addition of social work, chaplaincy, blood bank staff, and the ED pharmacist to the team).[19] For example, inclusion of an ED pharmacist could help expedite access to important medications like anticoagulant reversal agents, rapid sequence intubation meds and push-dose pressors.

In addition, incorporating post-activation debrief sessions[20] as well as simulation and team training could further improve the team's performance.[21] As we continue to gain experience with the protocol and better understand its usage and impact on patient care, we hope other institutions will seek to implement a similar approach to eligible patients with severe GI bleeding, leading to improved outcomes.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

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