

## A Multidisciplinary Management Algorithm of Acute Gastrointestinal Bleeding: A Quality Improvement Project

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### Abstract

Acute gastrointestinal (GI) bleeding is a common emergency condition requiring immediate medical attention and multidisciplinary team approach. We developed a management algorithm for acute GI bleeding in our hospital. Our preplanned acute GI bleeding protocol significantly facilitated patient management and improved communication between medical providers, patients, and their families. Management algorithm can greatly facilitate patient care and improve outcomes in acute GI bleeding situations. Our approach can serve as a framework for the establishment of similar quality improvement protocols in other institutions.

**Keywords:** Endoscopy; Gastrointestinal bleeding; Multidisciplinary approach; Therapy; Quality improvement

### Introduction

Despite that there are multiple practice guidelines for the management of patients with acute GI bleeding, these guidelines typically approach it from a specific medical specialty's point of view (i.e. gastroenterology, surgery, or interventional radiology) [1-4]. A multidisciplinary involvement is generally required but this complex environment can create a number of problems [5-8]. For example, patients are typically seen in the emergency room where initial evaluation and resuscitations are initiated. They are then admitted to either internal medicine or intensive care where a gastroenterologist is consulted. Although gastroenterologists successfully treat most GI bleeds with endoscopy, a significant number of patients will require further imaging (e.g. tagged red blood cell scan) or interventions by radiology or surgery. This complex environment can create a significant number of problems, varying in magnitude based on the size of the hospital and type of environment (academic versus private hospital). Nevertheless, some issues seem to be of common occurrences.

### Step one: identify the problems

We were able to identify the following key recurrent problems in our institution related to the care of patients with acute GI bleeding:

A management strategy is created without all the parties involved. In consequence, there is no consensus on the best next step (gastroenterology recommends angiogram, interventional radiology (IR) recommends tagged red blood scan (RBC), surgery recommends repeat endoscopy).

There may be poor communications between teams. The plan for a specific management strategy is not proactively communicated to providers who will carry out the intervention (angiogram for recurrent

bleeding is agreed by the intensive care unit (ICU) and gastroenterology team but IR is only notified when the patients actually re-bleeds).

Even when all the appropriate parties are involved, the process of engagement tends to be very slow and ridden with miscommunication. For example, in a large academic hospital like ours, the gastroenterology attending will first communicate with the gastroenterology fellow, who in turn will pass on that recommendation to the ICU resident. The ICU resident then will call the IR fellow, who will finally correspond with the IR attending. The relay of information up and down the chain of command frequently resulted in a very slow reaction time and many miscommunications.

Significant variability of opinions exists among physicians within the same subspecialty (e.g. do tagged RBC scan or computed tomography angiography). As a result, not only are recommendations made based on the physician on call, but the plan for the same patient could also change with shift change.

There may be a significant delay in the involvement of surgical service in patient management. With the advancement in medicine, only a small number of patients with GI bleeding need surgical interventions. However, for those that do, it is common for the surgical team to get involved only after the patient has failed a number of other interventions and has received multiple transfusions.

The patients and their family are given different messages. With no dedicated spokesperson, the various teams involved can give conflicting information.

The management plan is not clearly documented in the patient's record.

This environment frequently provided delays in patient care and fueled the patient, family, and the medical provider's dissatisfaction. Therefore, we decided to create a comprehensive multidisciplinary management algorithm for patients with acute GI bleeding based on

the best available scientific evidence and also incorporating resources, factors and opinions specific to our own institution.

### **Step two: quality improvement process to create an institution specific GI bleeding protocol**

We created a task force consisting of a gastroenterologist, a diagnostic radiologist, an interventional radiologist, a hospitalist, a critical care physician and a surgeon. We went through the following steps:

We created a list of issues that are encountered by various services.

We reviewed the current practice guidelines and recent published papers.

One of us (gastroenterologist) created the first draft of the management algorithm.

At our internal quality improvement gastroenterology conference, we obtained inputs from all gastroenterology faculties and fellows.

The document was then circulated to all of the members of the taskforce to gather their insights and then each division internally discussed the protocol and provided feedback.

All the changes were incorporated and the document was distributed one more time for final approval.

### **Step three: our GI bleeding protocol**

We obtained our institutional specific multidisciplinary GI bleeding protocol after completion of our task force work.

Not all cases of GI bleeding require activation of the protocol but any service can activate the process when they deem it necessary.

A "tripwire" system that triggers initiation of the GI bleeding protocol was created. Specific parameters include:

Hemodynamic instability on presentation to the emergency room.

More than four units PRBC transfusion requirements over 24 hours or 8 units in total throughout the hospital course.

Need for second endoscopy due to re-bleeding.

No clear source identified on initial upper or lower endoscopy.

The GI attending perceives that the patient is at particularly high risk for rebleeding even if the bleeding lesion is identified and successfully treated at index endoscopy.

Patient has prior episodes of bleeding

Patient has difficult to match blood type

Jehovah's witness

The first step in the protocol is to conduct a conference call with the gastroenterology, interventional radiology, surgical and ICU attending simultaneously on the same line.

All 4 attendings are text paged by the hospital operator and placed in a virtual telephone conference room as they answer their pages.

The attending that initiates the bleeding protocol presents the case to the members of the team and consensus management strategy is established.

A brief note is entered by the physician that initiated the protocol outlining the management plan in our electronic medical record system.

One person is designated to be in charge of communicating to the patient.

### **Discussion**

As a part of our continuing quality improvement effort, we have looked for coordination and treatment consensus in order to improve patient care. For patients with acute GI bleeding, the gastroenterologist plays a central role, as endoscopy has become the main therapeutic tool. Nevertheless, even the most straightforward cases require multidisciplinary involvement (emergency room physician, hospitalist, and anesthesiologist). For more complex cases, IR and surgery can have an important role [9]. Although our quality improvement project was primarily aimed to improve patient safety and outcomes [10,11], it also improved team spirit between colleagues from different specialties. Furthermore, we now provide better communication with both caregivers and patients.

We believe that an institution specific predetermined multidisciplinary team approach is an important road map to the future practice for the management of all GI diseases [12]. Our patients are now treated with the agreed upon therapy in a timely manner. The issues that we encountered in the past may not be pertinent in every institution and they may vary in magnitude depending on the setting (e.g. academic versus community hospital, degree of house staff involvement, availability of multiple surgical services in large hospitals). Furthermore, the availability of local resources may be quite different and therefore every hospital should strongly consider the establishment of such institution specific GI bleeding protocol.

### **Conclusion**

We have found that multidisciplinary management protocol of acute GI bleeding is well worth our time and effort and we hope that our experience can serve as a useful framework for the establishment of similar protocols in other institutions.

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