Anti-Coagulation/Thrombotic (ACT) Alert

Alert Protocol for Blunt Head Injury Patients on Antithrombotic Therapy

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Purpose:
- As early as 2004 it was reported that 10% of older adults who arrive to the emergency department (ED) with blunt head injury take warfarin. In recent years, incidence of brain injuries among the elderly is increasing and thought to be related to anticoagulant and antiplatelet drugs.
- Bleeding is a serious complication associated with antithrombotic therapy. Early identification is critical in blunt head injury.
- The purpose of this study was to implement a system-based protocol to improve identification of head injured patients taking antithrombotics and decrease the door to computerized tomography (CT) scan start and result times.

Clinical question:
Does implementation of an antithrombotic alert protocol improve the identification of the blunt head injured patient and decrease door to CT scan start and result times?

ACT Alert
EVERY MINUTE COUNTS

Setting/Design:
- 176-bed suburban level II trauma center located in the Midwestern United States with an annual ED volume of 34,000.
- Retrospective chart review identified patients on antithrombotic medication who sustained a blunt head injury.
- Charts were reviewed for ED arrival time to CT scan start and result times.

Participants:
- All blunt head injured patients ≥65 years old from January 2014-May 2015 on warfarin therapy.
- Pre-ACT alert data only included patients taking warfarin.
- ACT alert protocol included all antithrombotic agents except acetylsalicylic acid (ASA) and non-steroidal anti-inflammatory (NSAIIds) drugs.

Background/Methods:
- Review of head injured patients in the ED identified patients on antithrombotic therapy took longer than two hours to initiate reversal agents.
- Initial data revealed the need to improve patient identification and timeliness to CT scan start and results.
- Previous efforts were ineffective in decreasing door to CT scan start and result times.
- Literature search was done to identify methods to improve patient identification and CT timeliness.
- A systems-based ACT alert protocol from Lancaster General Hospital, Lancaster, PA was identified and adapted for our ED.
- Consistent with the ED system for treating patients, ED nurses, pharmacists, laboratory and radiology technologists and physicians were educated on the ACT alert protocol.
- ACT alert protocol was implemented July 1, 2014.

Results/Outcomes
We compared data collected retrospectively from January–June 2014 prior to the intervention with data collected over an 11-month period after intervention implementation July 2014-May 2015. All findings were highly statistically significant.

Patient identification:
- A 4-fold increase in warfarin patients identified: 29 patients (pre-intervention) to 117 patients (intervention phase; t=3.34, p=0.0044).
- Greater than 25-minute improvement in mean door to CT scan start time from 67.9 minutes (pre-intervention) to 42.0 minutes (intervention phase; t=4.52, p=0.0001).

Door to CT scan result time:
- Greater than 30-minute improvement in mean door to CT scan result time from 96.3 minutes (pre-intervention) to 67.7 minutes (intervention phase; t=2.87, p=0.0047).

Alternate analysis: Inclusion of all antithrombics (except ASA & NSAID}

Conclusions:
- We were able to successfully adapt and implement system-based interventions to identify the antithrombotic patients at risk for blunt head injured brain bleeds.
- We reduced the time from ED arrival to CT scan start and result times. The improvement was both statistically significant and clinically meaningful with time improvements > 25 minutes.
- Our focus on educating personnel involved in the care of the ACT alert patient demonstrated results that we were not able to produce previously.
- While these results are very encouraging, future efforts need to be focused on continuing to improve patient identification and door to CT scan start and result times as well as examining other key outcomes such as time to administration of reversal agent(s).
- Comprehensive system-based interventions hold great promise for the improvement of the blunt head injured patient on antithrombotic medication.