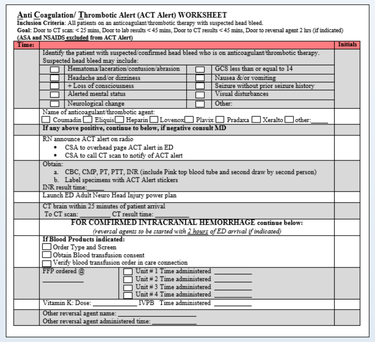
Anti-Coagulation/Thrombotic (ACT) Alert

Alert Protocol for Blunt Head Injury Patients on Antithrombotic Therapy

Kathy Phelan MS, RN, CEN, Margaret Obenauf MSN, RN, CEN, CPEN, Karla Christianson MSN, RN, CEN
Advocate Good Shepherd Hospital, Barrington, Illinois
Kathy.Phelan@advocatehealth.com



Anti Coagulation/ Thrombotic Alert (ACT Alert) WORKSHEET
Inclusion Criteria: All patients on an anticoagulant/thrombotic therapy with suspected head bleed.
Goal: Door to CT scan: < 25 mins, Door to lab results < 45 mins, Door to CT results < 45 mins, Door to reversal agent 2 hrs (if indicated)
(ASA and NSAIDS excluded from ACT Alert)

1 time:		Initials
	Identify the patient with suspected/confirmed head bleed who is on anticoagulant/thrombotic therapy: Suspected head bleed may include: ☐ Hematoma/laceration/contusion/abrasion ☐ GCS less than or equal to 14 ☐ Headache and/or dizziness ☐ Nausea &/or vomiting ☐ + Loss of consciousness ☐ Seizure without prior seizure history ☐ Alerted mental status ☐ Visual disturbances ☐ Neurological change ☐ Other:	
	Name of anticoagulant/thrombotic agent: ☐ Coumadin ☐ Eliquis ☐ Heparin ☐ Lovenox ☐ Plavix ☐ Pradaxa ☐ Xeralto ☐ other:____	
	If any above positive, continue to below, if negative consult MD	
	RN announce ACT alert on radio • CSA to overhead page ACT alert in ED • CSA to call CT scan to notify of ACT alert	
	Obtain: a. CBC, CMP, PT, PTT, INR (include Pink top blood tube and second draw by second person) b. Label specimens with ACT Alert stickers INR result time:_____	
	Launch ED Adult Neuro Head Injury power plan	
	CT brain within 25 minutes of patient arrival To CT scan: CT result time:	
	FOR CONFIRMED INTRACRANIAL HEMORRHAGE continue below: *Reversal agents: to be started with 2 hours of ED arrival (if indicated)*	
	If Blood Products indicated: ☐ Order Type and Screen ☐ Obtain Blood transfusion consent ☐ Verify blood transfusion order in care connection	
	FFP ordered @ _____ ☐ Unit # 1 Time administered _____ ☐ Unit # 2 Time administered _____ ☐ Unit # 3 Time administered _____ ☐ Unit # 4 Time administered _____	
	Vitamin K- Dose: _____ IVPB Time administered _____	
	Other reversal agent name:_____ Other reversal agent administered time:_____	

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.[1] In recent years, incidence of brain injuries among the elderly is increasing and thought to be related to anticoagulant and antiplatelet drugs.[2] Anticoagulant use is increasing; warfarin prescriptions increased 45% from 1998 to 2004.[3]
- 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.

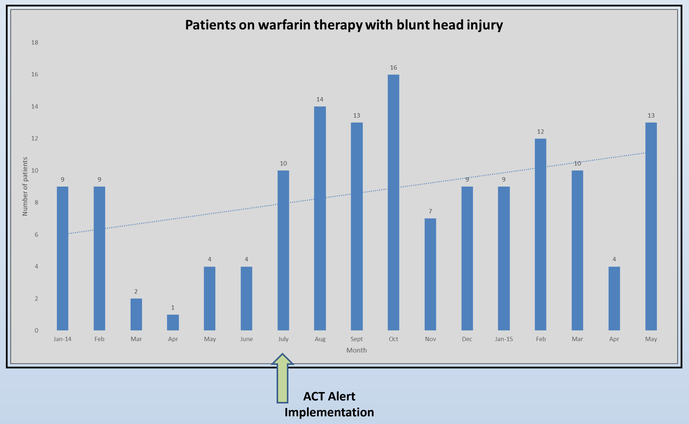
Clinical question:

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?

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.

http://www.tcpalm.com/news/trauma-center-lawnwood-medical-center

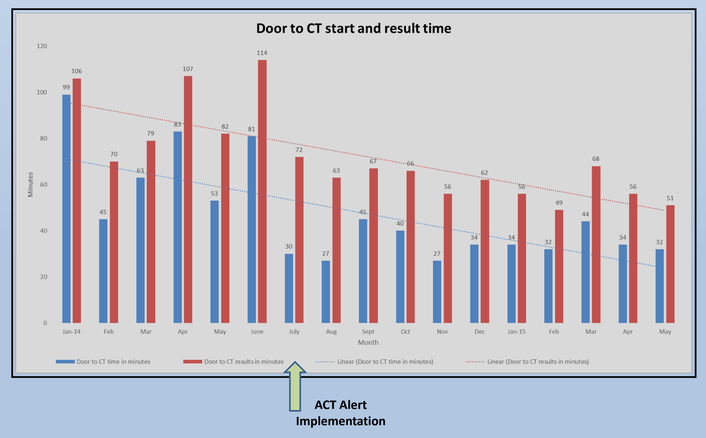


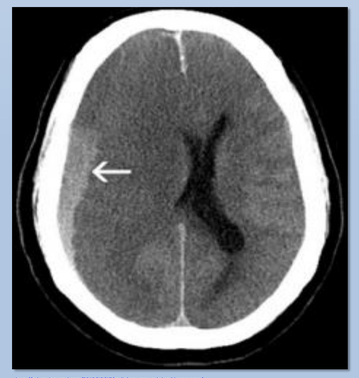
Participants:

- 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 (NSAIDs) 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 time.
- 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[4] 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.





http://education.vrad.com/2012/12/17/radiology-case-subdural-hematoma/

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).

Door to CT scan start time:

- 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 antithrombotics (except ASA & NSAIDs)

- Main analyses for this presentation are based on same-drug comparisons (warfarin only). Alternate analyses compared the warfarin data pre-intervention with all antithrombotics during the intervention phase. The results were essentially the same.
- Mean door to CT scan start time: 32-minute decrease from 67.9 to 35.31 minutes (intervention phase; t=4.54. p=0.0001).
- Mean door to CT result time: 60-minute decrease from 96.28 to 35.31 (intervention phase; t=4.30; p=< 0.01).

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.

References/Acknowledgment:

1.Colwell, C. (2015). Geriatric trauma: Initial evaluation and management. In M. Moreira (Ed), *UpToDate*. Retrieved from http://www.uptodate.com/contents/geriatric-trauma-initial-evaluation-and-management#H9197171 July 16, 2015.
2.Rangel-Castilla, L., Kopell, B., Salinas, P., Hanbali, F., Gasco, J., Penar, P., . . . & Ryszard, P. (2014). Closed head trauma. Retrieved from http://emedicine.medscape.com/article/251834-overview June 30, 2015.
3.Alrajhi, K., Perry, J., & Forster, A. (2015). Intracranial bleeds after minor and minimal head injury in patients on warfarin. *The Journal of Emergency Medicine, 48*(2), 137-142.
4.Rittenhouse, K., Rogers, A., Clark, E., Horst, M., Adams, W., Bupp, K., . . . & Rogers, F. B. (2015). The ACT alert: Preliminary results of a novel protocol to assess geriatric head trauma patients on anticoagulation. *The American Surgeon, 81*(4), 408-413.
5.Calland, J., Ingraham, A., Martin, N., Martin, N., Marshall, G., Schulman, C. Stapleton, T., & Barraco, R. (2012). Evaluation and management of geriatric trauma: An eastern association for the surgery of trauma practice management guideline. *Journal of Trauma and Acute Care Surgery, 73*(5), S345.
6.Acknowledgement to Eric P. Slora, Ph.D., for statistical analysis.

Advocate Good Shepherd Hospital

MAGNET RECOGNIZED
AMERICAN NURSES CREDENTIALING CENTER