



# Anticoagulants and Head Injuries



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# Common Anticoagulants and Indications

- **Coumadin** (warfarin) indicated for venous thrombosis, pulmonary embolism, atrial fibrillation, cardiac valve replacement, reduce risk of recurrent myocardial infarction and stroke.
- **Aspirin** indicated for treatment of pain/inflammation from arthritis, soft tissue injuries, pain, fever, and to decrease risk of recurrent stroke, transient ischemic attack (TIA) and myocardial infarction.
- **Lovenox** indicated for deep vein thrombosis, unstable angina, and myocardial infarction.
- **Plavix** indicated to reduce thrombotic events such as myocardial infarction, stroke, peripheral vascular disease and acute coronary syndrome.

# We Have Noted...

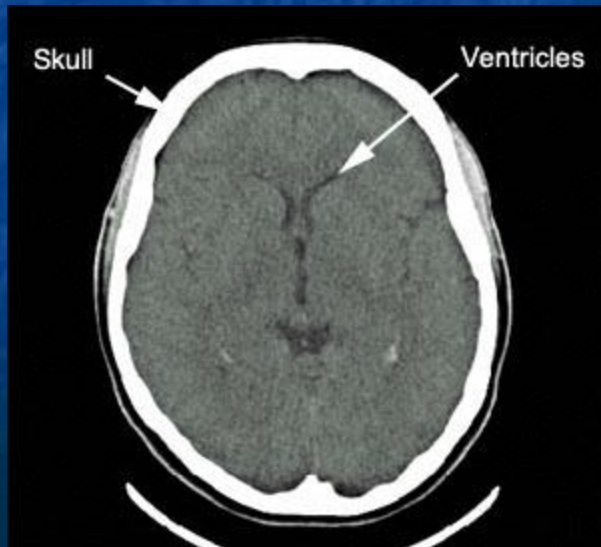
Lutheran General Trauma Department has identified over the last 6 months an increase in mortality due to falls with head injuries for pt on anticoagulants.

## *Did you know?*

According to the CDC, a person > 65 years of age dies every 35 minutes due to complications from a fall.



# Physiologic Changes



- As we age, our brains lose mass which allows for increased movement within the skull with any kind of trauma.
- There is an increased subdural space – more room for bleeding.

# Mechanism of Injury

- Even with **minor** head trauma, the pt on an anticoagulant is at great risk for a significant head injury.
- Especially at risk: unwitnessed falls.



# Possible Injuries

Subdural bleed



Intracerebral bleed



Epidural bleed



# Facts

- Anticoagulated patients have increased risk for bleeding, and serious outcomes could occur after head injury.
- ❖ Traumatic brain injury results in just over 1.3 million ED visits in USA.
- In elderly patients suffering a fall, long-term anticoagulation has been shown to increase not only the incidence of ICH compared to those not on anticoagulation (8.0% vs. 5.3%,  $p < 0.0001$ ), but to also increase mortality in those with ICH (21.9% vs. 15.2%,  $p = 0.04$ )

# Facts

- Clinical decision rules such as the Canadian CT Head Rule, the New Orleans criteria, and the NEXUS-II criteria exist to help determine which head injury patients require a head CT scan, these rules do not apply to anticoagulated patients

# Facts

- Studies in patients taking warfarin who suffer minor head injury have shown incidences of ICH ranging from 6.2% to 29%, leading some authors to conclude that most, if not all, such patients should undergo routine cranial CT scanning on presentation.

# Facts

- European guidelines suggest that all anticoagulated patients with head injury should be admitted for a period of routine observation, these recommendations are not based on studies of the prevalence of delayed ICH

# Questions we need to ask ??

- **Can Anticoagulated Patients Be Discharged Home Safely From the Emergency Department After Minor Head Injury?**
- **What is the risk of delayed ICH in anticoagulated patients with minor head injury and a normal initial head CT scan?**

- In the four studies reviewed, the incidence of delayed ICH after normal CT scan ranged from 0.6% to 6% .
- Clinically significant ICH requiring neurosurgical intervention is rare and ranged from 0 to 1.1%

- The incidence of death or neurosurgical intervention ranged from 0 to 1.1%.
- Another retrospective study of 1493 patients admitted for traumatic brain injury with preinjury warfarin use showed that both the risk of ICH and mortality were increased with higher INR.(INR  $\geq$  2.0. other study INR  $\geq$  3 )

- The risk of major bleeding is known to increase for those on combined anticoagulant–antiplatelet therapy, with hazard ratios of 1.83 (95% CI 1.72–1.96) and 3.08 (95% CI 2.32–3.91) for combined warfarin–aspirin and warfarin–clopidogrel use, respectively, compared to warfarin therapy alone

- it is estimated that 24-h observation and repeat CT scan would cost over 1 million dollars per patient undergoing neurologic intervention.

# Clinical Take Home Points

- Routine head CT in head-injured patients with previous warfarin or clopidogrel use should be performed, even in well-appearing patients regardless of lack of clinical findings

# Clinical Take Home Points

- Delayed traumatic ICH in patients on therapeutic warfarin and clopidogrel is very rare and these patients may be discharged home after a negative initial head CT, but with explicit discharge instructions and close follow up

# Clinical Take Home Points

- 24 hour observation of patients with poor functional capacity, long travel times to get to a hospital, and/or patients with no one at home to watch them would also be an acceptable alternative

# Clinical Take Home Points

- Patients with therapeutic anticoagulation, blunt head trauma, and a negative initial head CT **DO NOT** need to have their anticoagulation aggressively reversed

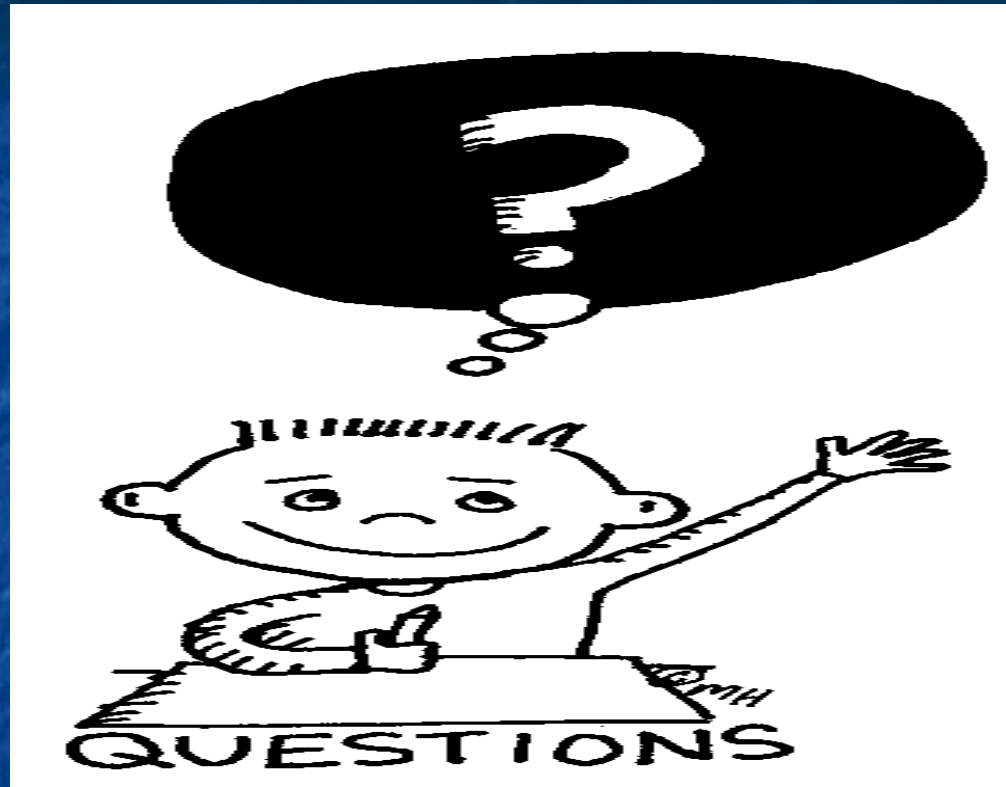
- Patients with supratherapeutic anticoagulation, blunt head trauma, and a negative initial head CT , I would have a low threshold to admit them for frequent neuro checks, repeat measurement of INR (while holding anticoagulation), and possibly repeat head CT if any change in exam

# What Do We Do At the Hospital?

## **Stop the bleeding!**

- With a patient on coumadin, within one hour of positive CT scan we administer fresh frozen plasma and vitamin K.
- With a patient on aspirin, within one hour of positive CT scan we administer platelets.
- We have an extensive 2 page guideline for reversal of anticoagulants.

- In Conclusion
- Identified high risk patients (age > 65 ,  
INR >3, Combined ASA with warfarin
- Order CT head even Normal Nuerological  
exam
- 24 h observation in hospital depend on  
your judgment
- Dealyed ICH is rare but need good  
instruction



Any Questions???