Southern Minnesota Regional Trauma Advisory Committee (SMRTAC)

Regional Practice Management Guideline

Reverse Anticoagulation Guideline for the Known or Suspected Adult Head Injured Patient

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<th>Adult Practice Management Guideline</th>
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<td>Contact: SMRTAC Coordinator</td>
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**Purpose**

To outline a process for the urgent reversal of anti-coagulation in the adult patient with a known or suspected head injury who is taking Warfarin or low-molecular weight heparin.

**Definitions**

1. Adult trauma patient – any patient age fifteen (15) or older suffering an injury. For the purposes of this guideline the definition is any injured patient who may be at risk for a spine injury.
2. Anti-coagulated patient – Any condition that places the patient at risk for excessive bleeding due to a deficiency of blood clotting elements (e.g., vitamin K deficiency, hemophilia, thrombocytopenia, chronic anticoagulation therapy with Coumadin, Plavix or similar medications). Does not include patients on chronic aspirin therapy.

**Policy Statements**

1. Minor mechanisms of injury (MOI) are a known cause of significant cranial hemorrhage in patients on anti-coagulation therapy. This should include sitting or standing level falls.
2. Warfarin-related intracranial hemorrhage (ICH) is a medical emergency with a mortality rate as high as 50% at thirty (30) days.
3. Rapid reversal of Warfarin anticoagulation is recommended in Warfarin related ICH, especially with higher relative international normalized ratios (INR) and in patients who are symptomatic with a neurological deficit.
4. Currently no guidelines exist for reversing the effects of direct thrombin inhibitors or platelet inhibitors.
5. Literature research suggests that the anticoagulated head injured patient who presents shortly after injury may have an initial negative head CT, but may go on to develop a significant ICH. Caution should be used with these low risk patients on a case by case basis, being cognizant of need for observation and repeat CT in twelve (12) hours.
**Procedure Statements**

Any patient taking anti-coagulation medications with a known mechanism of injury history (any fall to include sitting and standing, struck head on object, etc) with a persistent GCS ≤ 13 or reported change in mentation by caregiver:

1. Arrange for immediate transfer to a facility with Neurosurgery capabilities. If time permits, obtain head CT—this should not delay transfer.
2. Obtain stat baseline INR for patients on Warfarin or low-molecular-weight heparin.
3. If INR ≥ 1.5
   a. Transfuse 2 – 4 units of Fresh Frozen Plasma if available
      i. Do not delay transfer to administer plasma
      ii. Mayo One helicopters carry plasma and can bring to patient for administration during transport.
   b. Administer **Vitamin K** (Phytonadione) 10 mg IV as a slow IV push with maximum 1mg/min or as a IV piggyback over thirty (30) minutes (maximum dosing is 1mg/min). The decision to treat with IV vitamin K rests with the treating physician, and carries a risk (3/10,000) of anaphylactic and uncertain risk (possibly rare) or anaphylactoid reaction. Monitor for allergic reactions during infusion of medication
   c. Notify receiving facility of INR results

Any patient taking anti-coagulation medications with a known mechanism of injury history (fall, struck head on object, etc) with a persistent GCS > 13:

1. Obtain stat baseline CBC, PT, INR and stat head CT.
   a. Do not delay transport to tertiary care in order to obtain head CT.
   b. Order other lab and radiologic studies as appropriate
2. If head CT positive for hemorrhage begin following sequence if INR > 1.5
   a. Arrange for immediate transfer to facility with Neurosurgery capabilities
      i. Communicate patient anti-coagulation history and INR to referring facility
      ii. Immediately arrange for transmission of head CT imaging via web or PACS system after patient referral accepted
   b. Transfuse 2 – 4 units of Fresh Frozen Plasma if available
      i. Do not delay transport to administer plasma
      ii. Mayo One helicopters carry plasma and can bring to patient for administration during transport.
   c. Administer **Vitamin K** (Phytonadione) 10 mg IV as a slow IV push with maximum 1mg/min or as a IV piggyback over thirty (30) minutes (maximum dosing is 1mg/min). The decision to treat with IV vitamin K rests with the treating physician, and carries a risk (3/10,000) of anaphylactic and uncertain risk (possibly rare) or anaphylactoid reaction. Monitor for allergic reactions during infusion of medication
   d. Notify receiving facility of INR results
3. For those patients on low-molecular weight Heparin may consider **Protamine Sulfate** (maximum dose 50 mg).


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**Prepared by:** SMRTAC leadership

**Approvals:** SMRTAC 12/13/2012; SMRTAC 03/08/2013

**Disclaimer:** This is a general guideline and is not intended as a substitute for clinical judgment or as a protocol for the management of all trauma patients.
Guideline for Reversal of Anticoagulation Therapy in the Known or Suspected Head-injured Adult

Perform Primary and Secondary Surveys

Known mechanism of injury (fall-even from standing or sitting height, struck head on an object) or alteration in level of consciousness reported by caregiver
Is GCS less than 13?

Obtain STAT INR on patients taking Warfarin or LMW heparin (Lovenox)

INR equals/greater than 1.5?

1. Transfuse Fresh Frozen Plasma (if available)
2. Administer Vitamin K 10 mg IV infusion over 30 minutes (MD decision)
3. Notify Receiving facility of lab values and actions

DO NOT delay transport to a Neurosurgery facility for CT or plasma
Prepare for immediate transfer

Head CT positive for bleed?

Patients with GCS greater than or equal to 13
STAT CBC, INR, and PT
STAT head CT

INR equals/greater than 1.5?

Patients with high INR and negative head CT for bleed may need to be observed with repeat head CT in 12 hours on a case by case basis.

Arrange for immediate transfer
Transmit CT via web or PACS system to receiving facility

For patients on LMW heparin, the treating physician may consider Protamine Sulfate (50 mg maximum dose)

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