Southern Minnesota Regional Trauma Advisory Committee (SMRTAC)

Regional Practice Management Guideline

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

Adult **Practice Management Guideline**	**Effective: 12/2012**
Contact: SMRTAC Coordinator	**Last Reviewed: 03/2013**

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 $\leq$ 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 $\geq$ 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 $\geq$ 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 anaphylactic 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).

Resources/Links

1. Ansell J, Hirsh, J Hylek E, Jacobson A, et al. Pharmacology and Management of the Vitamin K Antagonists: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition) *Chest* June 2008 133:160S-198S; doi:10.1378/chest.08-0670.

2. Itshayek E, Rosenthal G, Fraifeld S, et al. Delayed Posttraumatic Acute Subdural Hematoma in Elderly Patients on Anticoagulation. *Neurosurgery* May 2006; 58(5): 851-856.

3. Leiblich A, Mason S. Emergency management of minor head injury in anticoagulated patients. *Emerg Med J* 2011; 28:115-118.

4. Makris M, Greaves M, Phillips WS, Kitchen S, et al. Emergency oral anticoagulation reversal: the relative efficacy of infusion of fresh frozen plasma and clotting factor concentrate on correction of the coagulopathy. *Thromb Haemost*. 1997;77:477-480.

5. Menditto V, Lucci M, Polonara S, Pomponio G,, Gabrielli A. Management of Minor Head Injury in Patients Receiving Oral Anticoagulant Therapy: A Prospective Study of a 24-Hour Observation Protocol. *Annals of Emergency Medicine* June 2012; 59(6): 451-455.

Prepared by: SMRTAC leadership
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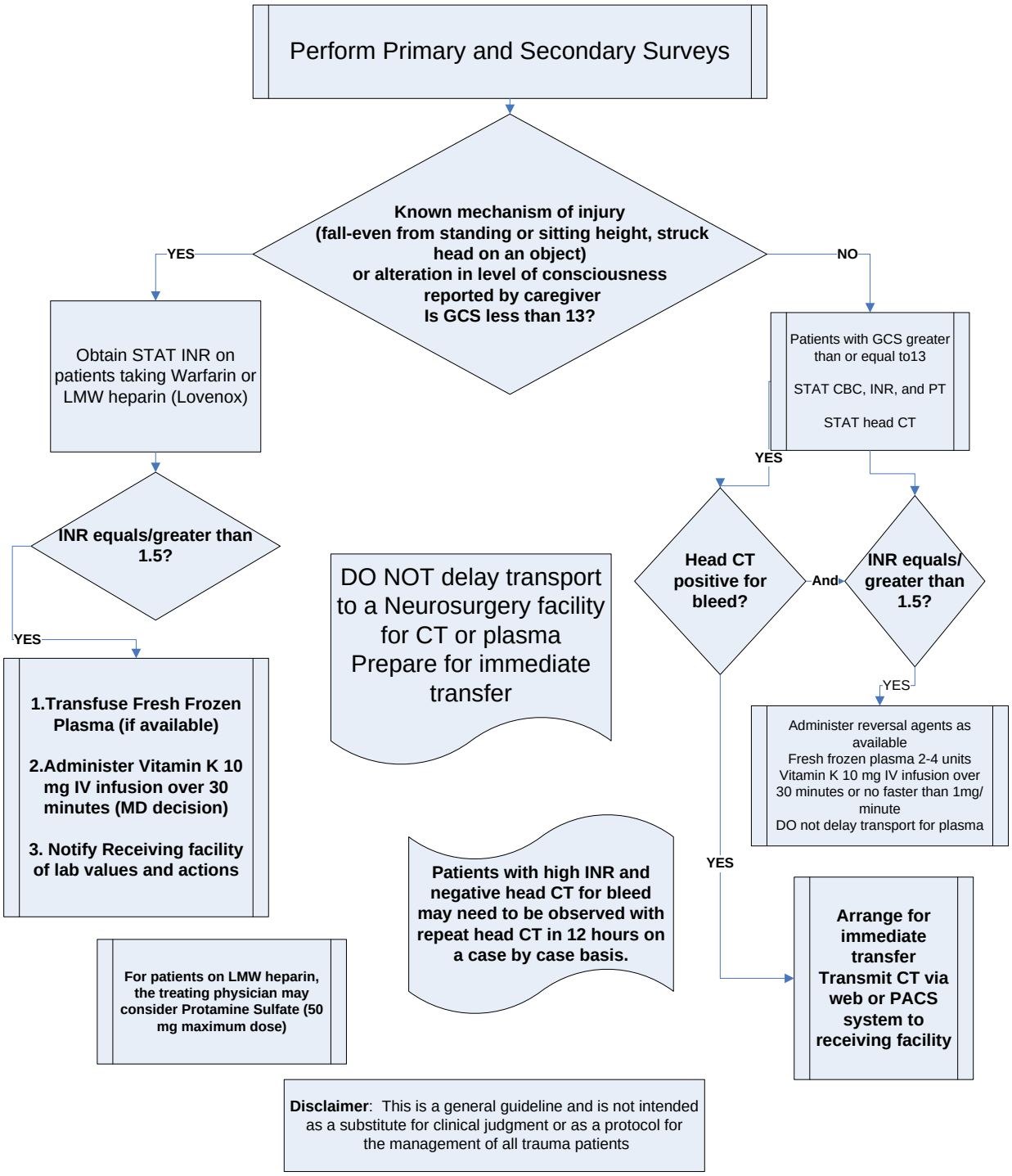
Disclaimer: This is a general guideline and is not intended as a substitute for clinical judgment or as a protocol for the management of all trauma patients.

Guideline for Reversal of Anticoagulation Therapy in the Known or Suspected Head-injured Adult



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