DEPARTMENT OF HEALTH

# Hemorrhagic Stroke

## CONSIDERATIONS FOR MANAGEMENT OF NON TRAUMATIC INTRACRANIAL & SUBARACHNOID HEMORRHAGES IN THE ED

The purpose of this document is to offer considerations for the management of hemorrhagic stroke patients including non-traumatic intracranial and subarachnoid hemorrhages in the Emergency Department. It specifically provides guidance on the immediate clinical work up, neurology consultation, blood pressure management, coagulopathy reversal, disposition recommendations including considerations for admitting locally, and other treatments for this patient population. It is designed to promote quality and consistency in practice and not intended to create new expectations for the Acute Stroke Ready Hospital designation level.

- Stroke code activation if meets activation criteria
  - Otherwise, contact neurology **as soon as possible**- provide neurological exam findings, BP, medical history, medications
- Stabilize- Adequate airway and ventilation
- IV start
- Stat labs- glucose, CBC, BMP, PT, PTT, INR
- Stat Imaging- CT head without
- BP Control- contact neurology for recommendations for target BP. Work with your Primary or Comprehensive Stroke Center partners to include BP parameters within your protocols.
  - Labetalol 10-20 mg IVP over 1-2 minutes, may repeat every 10 mins for a max of 300mg
  - Nicardipine 5mg/hr IV infusion- titrate by increasing 2.5mg/hr every 5 mins to max of 15mg/hr
  - Clevidipine 1-2mg/hr IV- titrate by doubling the dose every 2-5 min until desired BP reached; maximum 21 mg/hr
- Coagulopathy reversal
  - Vitamin K antagonist- Warfarin(Coumadin) associated: (goal INR < 1.4)
    - 4 Factor PCC- KCentra- 50 units/kg
    - 3 Factor PCC
    - FFP (when 4 Factor PCC not available)
    - Vitamin K 5-10 mg IV
    - Vitamin K 2.5- 10mg po

    *For intraparenchymal hemorrhage it is recommended to administer Vitamin K in conjunction with another reversal agent.
  - Direct thrombin inhibitor- Pradaxa(Dabigatran) associated:
    - idarucizumab(Praxbind) 5g IV
      - Consider 4 Factor PCC if unavailable
  - Factor Xa Inhibitor- Rivaroxaban(Xarelto), apixaban(Eliquis) associated:
    - AndexXa(andexanet alfa)- per hospital protocol
      - Consider 4 Factor PCC- 50 units/kg if unavailable

- **Arrange rapid transport to Neurosurgical capable center**
- **Considerations for admitting locally***:*
  - *Family/patient wishes- consider comfort cares: age, size of infarct, prognosis*
    - Encourage neurology partners to participate in active discussion with patient/family regarding prognosis
- Other treatments/considerations:
  - Seizure precautions, HOB 30 degrees, NPO (until screening)
  - Nausea management: Zofran- preferred
  - Consult Neurology for:
    - Seizure management: Lorazepam (Ativan), Leviteracitam(Keppra), Phenytoin(Dilantin)
    - ICP management: Mannitol or Hypertonic Saline

References:

1. (2015) Guidelines for the Management of Spontaneous Intracerebral Hemorrhage. A Guideline for Healthcare Professionals From the American Heart association/American Stroke Association. *Stroke*. 2015;46:2032-2060
2. Steiner, Thorsten, MD, MME; Weitz, Jeffrey, MD; Veltkamp, Roland, MD (2017). Anticoagulant-Associated Intracranial Hemorrhage in the Era of Reversal Agents. *Stroke.*2017;48:1432-1437
3. 2017 ACC Expert Consensus Decision Pathway on Management of Bleeding in Patients on Oral Anticoagulants: A Report of the American College of Cardiology Task Force on Expert Consensus Decision Pathways. *J Am Coll Cardiol* 2017; Dec1
4. Guideline for Reversal of Antithrombotics in Intracranial Hemorrhage. A Statement for Healthcare Professionals from the Neurocritical Care Society and Society of Critical Care Medicine. (2015). *Spring Science+Business Media New York 2015*

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