Management of ICH: (AHA/ASA May-2015)

Emergency Diagnosis and Assessment:

- CTA and contrast-enhanced CT may be considered to help identify patients at risk for hematoma expansion

Hemostasis and Coagulopathy, Antiplatelet Agents, and DVT Prophylaxis:

- Patients with a severe coagulation factor deficiency or severe thrombocytopenia should receive appropriate factor replacement therapy or platelets, respectively.
- Patients with ICH whose INR is elevated because of VKA should have their VKA withheld, receive therapy to replace vitamin K–dependent factors and correct the INR, and receive intravenous vitamin K. PCCs may have fewer complications and correct the INR more rapidly than FFP and might be considered over FFP (Class IIb; Level of Evidence B). rFVIIa does not replace all clotting factors, and although the INR may be lowered, clotting may not be restored in vivo; therefore, rFVIIa is not recommended for VKA reversal in ICH.
- For patients with ICH who are taking dabigatran, rivaroxaban, or apixaban, treatment with FEIBA, other PCCs, or rFVIIa might be considered on an individual basis. Activated charcoal might be used if the most recent dose of dabigatran, apixaban, or rivaroxaban
- The usefulness of platelet transfusions in ICH patients with a history of antiplatelet use is uncertain.
- Although rFVIIa can limit the extent of hematoma expansion in noncoagulopathic ICH patients, there is an increase in thromboembolic risk with rFVIIa and no clear clinical benefit in unselected patients. Thus, rFVIIa is not recommended.
- Pneumatic compression should be used for prevention of venous thromboembolism. Graduated compression stockings are not beneficial to reduce DVT or improve outcome.
- After documentation of cessation of bleeding, low dose subcutaneous low-molecular-weight heparin or unfractionated heparin may be considered for prevention of venous thromboembolism in patients with lack of mobility **after 1 to 4 days from onset.**

BP Recommendations:

- SBP should be lowered to 140 mmHg in patients with ICH (Class I; Level of Evidence A)

Seizures and Antiseizure Drugs:

- Continuous EEG monitoring is probably indicated in ICH patients with depressed mental status that is out of proportion to the degree of brain injury.
- **Prophylactic antiseizure medication is not recommended**.

Management of Medical Complications:

- Systematic screening for myocardial ischemia or infarction with electrocardiogram and cardiac enzyme testing after ICH is reasonable.

ICP Monitoring and Treatment:

- If CPP monitoring is indicated, CPP of 50 to 70 mmHg may be reasonable to maintain depending on the status of cerebral auto regulation.
- Corticosteroids should not be administered for treatment of elevated ICP in ICH (Class III; Level of Evidence B).

IVH:

- Although intraventricular administration of rtPA in IVH appears to have a fairly low complication rate, the efficacy and safety of this treatment are uncertain.
- The efficacy of endoscopic treatment of IVH is uncertain

Surgical Treatment of ICH:

- Patients with cerebellar hemorrhage who are deteriorating neurologically or who have brainstem compression and/or hydrocephalus from ventricular obstruction should undergo surgical removal of the hemorrhage as soon as possible. Initial treatment of these patients with ventricular drainage rather than surgical evacuation is not recommended.
- A policy of early hematoma evacuation is not clearly beneficial compared with hematoma evacuation when patients deteriorate.
- Supratentorial hematoma evacuation in deteriorating patients might be considered as a life-saving measure.
- The effectiveness of minimally invasive clot evacuation with stereotactic or endoscopic aspiration with or without thrombolytic usage is uncertain.

Prevention of Recurrent ICH:

- Risk factors for ICH recurrence: (1) lobar location of the initial ICH; (2) older age; (3) presence and number of microbleeds on gradient echo MRI; (4) ongoing anticoagulation; and (5) presence of apolipoprotein E ε2 or ε4 alleles.
- Measures to control BP should begin immediately after ICH onset. A long-term goal of BP < 130 mmHg systolic and 80 mmHg diastolic is reasonable.
- Lifestyle modifications, including avoidance of alcohol use greater than 2 drinks per day, tobacco use, and illicit drug use, as well as treatment of obstructive sleep apnea, are probably beneficial.
- **Avoidance of long-term anticoagulation with warfarin** as a treatment for nonvalvular atrial fibrillation is probably recommended after warfarin-associated spontaneous lobar ICH because of the relatively high risk of recurrence.
- **Anticoagulation after nonlobar ICH and antiplatelet monotherapy after any ICH might be considered**, particularly when there are strong indications for these agents.
- The optimal timing to resume oral anticoagulation after anticoagulant-related ICH is uncertain. **Avoidance of oral anticoagulation for at least 4 weeks, in patients without mechanical heart valves, might decrease the risk of ICH recurrence.** If indicated, aspirin monotherapy can probably be restarted in the days after ICH, although the optimal timing is uncertain.
- The usefulness of dabigatran, rivaroxaban, or apixaban in patients with atrial fibrillation and past ICH to decrease the risk of recurrence is uncertain.
- There are insufficient data to recommend restrictions on the use of statins in ICH patients