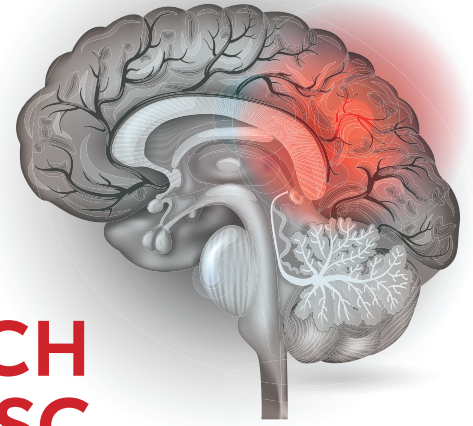




American  
Heart  
Association.



# Guidance for Management of Acute ICH Prior to Transfer to the CSC

Spontaneous, nontraumatic intracerebral hemorrhage (ICH) is a significant cause of morbidity and mortality throughout the world. Population-based studies show that most patients present with small ICHs that are readily survivable with good medical care.<sup>1</sup>

This document capsulizes a critical portion of the *2015 Guidelines for the Management of Spontaneous Intracerebral Hemorrhage* from the American Heart Association/American Stroke Association.<sup>2</sup> The guidelines provide a broad, evidence-based framework for ICH clinical care, with the goal of tangibly improving patient outcomes. Please refer to the full guidelines for more information.

## MANAGING ACUTE ICH PRIOR TO TRANSFER



### EMERGENCY DIAGNOSIS AND ASSESSMENT RECOMMENDATIONS

1. A baseline severity score should be performed as part of the initial evaluation of patients with ICH (Class I; Level of Evidence B).
2. Rapid neuroimaging with CT or MRI is recommended to distinguish ischemic stroke from ICH (Class I; Level of Evidence A).
3. CTA and contrast-enhanced CT may be considered to help identify patients at risk for hematoma expansion (Class IIb; Level of Evidence B), and CTA, CT venography, contrast-enhanced CT, contrast-enhanced MRI, magnetic resonance angiography and magnetic resonance venography, and catheter angiography can be useful to evaluate for underlying structural lesions including vascular malformations and tumors when there is clinical or radiological suspicion (Class IIa; Level of Evidence B).

- ▶ **Neurological exam every 15 minutes. NIHSS, ICH scale on admission.**
- ▶ **Continuous monitoring of airway and blood pressure.**
- ▶ **Insert 18 gauge IV (anticipation of need for large bore IV for CT contrast)**
- ▶ **Run 0.9% NS at 100 cc/hour; amend rate in patients with volume issues.**
- ▶ **Ensure all imaging is available for view at the accepting hospital.**



## HEMOSTASIS AND COAGULOPATHY, ANTIPLATELET AGENTS AND DVT PROPHYLAXIS RECOMMENDATIONS

1. Patients with a severe coagulation factor deficiency or severe thrombocytopenia should receive appropriate factor replacement therapy or platelets, respectively (Class I; Level of Evidence C).
2. 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 (Class I; Level of Evidence C).

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 (Class III; Level of Evidence C).
3. 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 was taken <2 hours earlier.

Hemodialysis might be considered for dabigatran (Class IIb; Level of Evidence C).
4. Protamine sulfate may be considered to reverse heparin in patients with acute ICH (Class IIb; Level of Evidence C).
5. The usefulness of platelet transfusions in ICH patients with a history of antiplatelet use is uncertain (Class IIb; Level of Evidence C).
6. 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 (Class III; Level of Evidence A).
7. Patients with ICH should have intermittent pneumatic compression for prevention of venous thromboembolism beginning the day of hospital admission (Class I; Level of Evidence A). Graduated compression stockings are not beneficial to reduce DVT or improve outcome (Class III; Level of Evidence A).
8. 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 (Class IIb; Level of Evidence B).
9. Systemic anticoagulation or IVC filter placement is probably indicated in ICH patients with symptomatic DVT or PE (Class IIa; Level of Evidence C).

The decision between these 2 options should take into account several factors, including time from hemorrhage onset, hematoma stability, cause of hemorrhage, and overall patient condition (Class IIa; Level of Evidence C).

▶ **Appropriate reversal protocol for specific agents.**



## BP RECOMMENDATIONS

1. For ICH patients presenting with SBP between 150 and 220 mmHg and without contraindication to acute BP treatment, acute lowering of SBP to 140 mmHg is safe (Class I; Level of Evidence A) and can be effective for improving functional outcome (Class IIa; Level of Evidence B).
2. For ICH patients presenting with SBP >220 mmHg, it may be reasonable to consider aggressive reduction of BP with a continuous intravenous infusion and frequent BP monitoring (Class IIb; Level of Evidence C).

- ▶ **Maintain blood pressure at the desired level.**
- ▶ **Consider nicardipine infusion; titrate as necessary for desired goal.**



## GENERAL MONITORING AND NURSING CARE RECOMMENDATION

1. Initial monitoring and management of ICH patients should take place in an intensive care unit or dedicated stroke unit with physician and nursing neuroscience acute care expertise (Class I; Level of Evidence B).

- ▶ **Monitor for signs of increased ICP. Early expansion of ICH is common. May require rescanning.**
- ▶ **Communicate any changes to receiving facility so it's prepared to intervene on arrival.**



## GLUCOSE MANAGEMENT RECOMMENDATION

1. Glucose should be monitored. Both hyperglycemia and hypoglycemia should be avoided (Class I; Level of Evidence C).

- ▶ **Fingerstick glucose on admission and every hour until transfer. Insulin coverage.**



## TEMPERATURE MANAGEMENT RECOMMENDATION

1. Treatment of fever after ICH may be reasonable (Class IIb; Level of Evidence C).

▶ **Monitor body temperature every 30 minutes. Keep normothermic, antipyretics as needed.**



## SEIZURES AND ANTISEIZURE DRUGS RECOMMENDATIONS

1. Clinical seizures should be treated with antiseizure drugs (Class I; Level of Evidence A).
2. Patients with a change in mental status who are found to have electrographic seizures on EEG should be treated with antiseizure drugs (Class I; Level of Evidence C).
3. Continuous EEG monitoring is probably indicated in ICH patients with depressed mental status that is out of proportion to the degree of brain injury (Class IIa; Level of Evidence C). Prophylactic antiseizure medication is not recommended (Class III; Level of Evidence B).

▶ **Monitor for signs of seizure activity.**



## MANAGEMENT OF MEDICAL COMPLICATIONS RECOMMENDATIONS

1. A formal screening procedure for dysphagia should be performed in all patients before the initiation of oral intake to reduce the risk of pneumonia (Class I; Level of Evidence B).
2. Systematic screening for myocardial ischemia or infarction with electrocardiogram and cardiac enzyme testing after ICH is reasonable (Class IIa; Level of Evidence C).

▶ **Beside dysphagia screen for appropriate patients, determined by level of consciousness, oxygen saturation, secretion management, etc.**

▶ **If dysphagia screen is deferred due to patient condition, keep NPO, including medications. Communicate this information to the accepting facility. (A formal speech and language assessment should be pursued when appropriate).**



## ICP MONITORING AND TREATMENT: RECOMMENDATIONS

1. Ventricular drainage as treatment for hydrocephalus is reasonable, especially in patients with decreased level of consciousness (Class IIa; Level of Evidence B).
2. Patients with a GCS score of  $\leq 8$ , those with clinical evidence of transtentorial herniation, or those with significant IVH or hydrocephalus might be considered for ICP monitoring and treatment. A CPP of 50 to 70 mmHg may be reasonable to maintain depending on the status of cerebral autoregulation (Class IIb; Level of Evidence C).
3. Corticosteroids should not be administered for treatment of elevated ICP in ICH (Class III; Level of Evidence B).

- ▶ **Monitor for signs of increased ICP. Early expansion of ICH is common. May require rescanning.**
- ▶ **Communicate any changes to receiving facility so it's prepared to intervene on arrival.**

### References

1. Zahuranec DB, Gonzales NR, Brown DL, Lisabeth LD, Longwell PJ, Eden SV, Smith MA, Garcia NM, Hoff JT, Morgenstern LB. Presentation of intracerebral haemorrhage in a community. *J Neurol Neurosurg Psychiatry*. 2006; 77:340–344. doi: 10.1136/jnnp.2005.077164.
2. Hemphill JC 3rd, Greenberg SM, Anderson CS, Becker K, Bendok BR, Cushman M, Fung GL, Goldstein JN, Macdonald RL, Mitchell PH, Scott PA, Selim MH, Woo D; American Heart Association Stroke Council; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology. Guidelines for the Management of Spontaneous Intracerebral Hemorrhage: A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association. *Stroke*. 2015 Jul;46(7):2032–60. doi: 10.1161/STR.000000000000069. Epub 2015 May 28. PMID: 26022637.