Spontaneous ICH and SAH

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SPONTANEOUS INTRACEREBRAL HEMORRHAGE

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Spontaneous Intracerebral Hemorrhage

- Occurs when a blood vessel ruptures within the brain causing bleeding within the brain tissue, usually non-traumatic
- Second most common form of stroke
- Onset is smooth and progressive-unlike ischemic stoke
- Deadliest form of stroke
  - 35-52% dead at 1 month
    - 50 % within the first 48 hours
  - 80% mortality at 6 months
  - In-hospital mortality of comatose and ventilated ICH cases is 60%
  - Only 25% of survivors are independent at 6 months

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(Benjamin, et al., 2019)

Etiology

- Hypertension
- Coagulopathy
  - Anticoagulation therapy evolve slower, over 24-48 hours
    - = (Coumadin, NOACS)
  - clotting disorders
- Cerebral amyloid angiopathy
- Cocaine and methamphetamine use
- Vascular malformations

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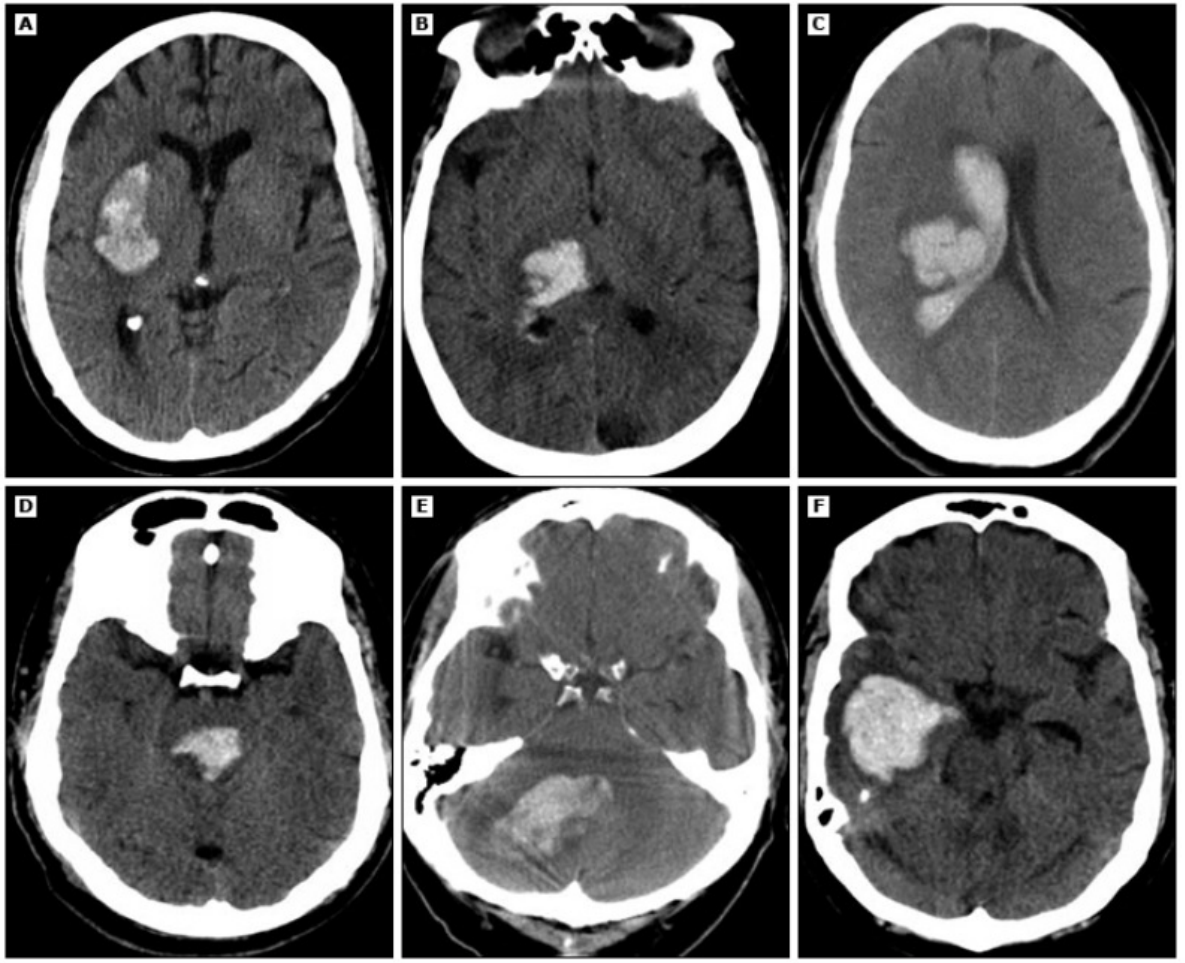
Typical Locations for Spontaneous Intracerebral Hemorrhage



Typical locations of hypertensive ICH are putamen (A), thalamus (B), subcortical white matter (C), pons (D) and cerebellum (E). Thalamic and subcortical hemorrhages often extend into ventricles (B and C). Cerebral amyloid angiopathy, drug abuse, or vascular anomaly often causes lobar hemorrhage (F)

(Dastur & Yu, 2017)

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Symptoms of Spontaneous Intracerebral Hemorrhage

- Similar to Ischemic Stroke
- SUDDEN
  - numbness or weakness of face, arm or leg - especially on one side of the body
  - confusion, trouble speaking or understanding
  - trouble seeing in one or both eyes; double vision
  - trouble walking, dizziness, loss of balance or coordination
  - severe headache with no known cause

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**Decreased level of consciousness, vomiting, headache, seizures and very high blood pressure might suggest the presence of ICH.

(Morotti & Goldstein, 2016)

Acute Management Strategies

Preventing further bleeding, hematoma expansion, and minimizing cerebral ischemia

- **Manage blood pressure**
  - Lower BP to decease risk of ongoing bleeding or hematoma expansion
    - Note that guidelines for BP management are variable
    - It may be reasonable to target systolic blood pressure between 140 and 180 mmHg with the specific threshold determined based on patient comorbidities and level of chronic hypertension
- **Reversal of Anticoagulants**
  - Vitamin K – Warfarin; Fresh Frozen Plasma (FFP); Prothrombin Complex Concentrate (K-centra); Recombinant factor VIIa (rFVIIa); Idarucizumab (Praxbind) – Dabigatran; Andexanet alpha (Andexxa) – Apixaban, Rivaroxaban, Edoxaban; Protamine - Heparin

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(Hemphill, et al., 2015)

Nursing Care

- **Neurological Assessment – early recognition of subtle changes**
  - **Monitoring for cerebral edema/increased intracranial pressure (ICP)**
    - **Early signs – decreased LOC (restlessness, confusion, change in orientation), headache, visual disturbances**
    - **Late signs are pupillary abnormalities, changes in BP (widening pulse pressure), heart rate (bradycardia), or changes in respiratory pattern**
- **Vital Signs – aggressive management of blood pressure per guidelines and orders**

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Nursing Care Continued

- **Seizure Precautions**
  - Seizure activity in patients with ICH usually occurs at or near the onset of symptoms
  - 2.7 to 17% of patients with ICH have seizures within the first 2 weeks, but the incidence of subclinical seizure activity on cEEG is much higher at 28% to 31%.

- **Complication Avoidance**
  - Aspiration Precautions – dysphagia screening prior to any PO
  - Infection
  - Bowel and Bladder regiment
  - Mobility – progressive mobility based on patient's condition and abilities
  - Skin Assessment
  - PE/DVT
  - Falls

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SPONTANEOUS SUBARACHNOID HEMORRHAGE

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Subarachnoid Hemorrhage

- The rupture of a blood vessel located within the subarachnoid space
  - Typically occurs at a site where a blood vessel has weakened and bulged, called an aneurysm
  - Often associated with a severe headache with a split-second onset and no known cause

- Mortality
  - 10 to 30% of patients die before reaching the hospital
  - 30 to 60 % mortality rate in those who do reach the emergency department

- Etiology
  - ruptured cerebral aneurysm
    - Cause of approximately 80% of non-traumatic SAH
    - Most occur around the Circle of Willis rupture of an arteriovenous malformation

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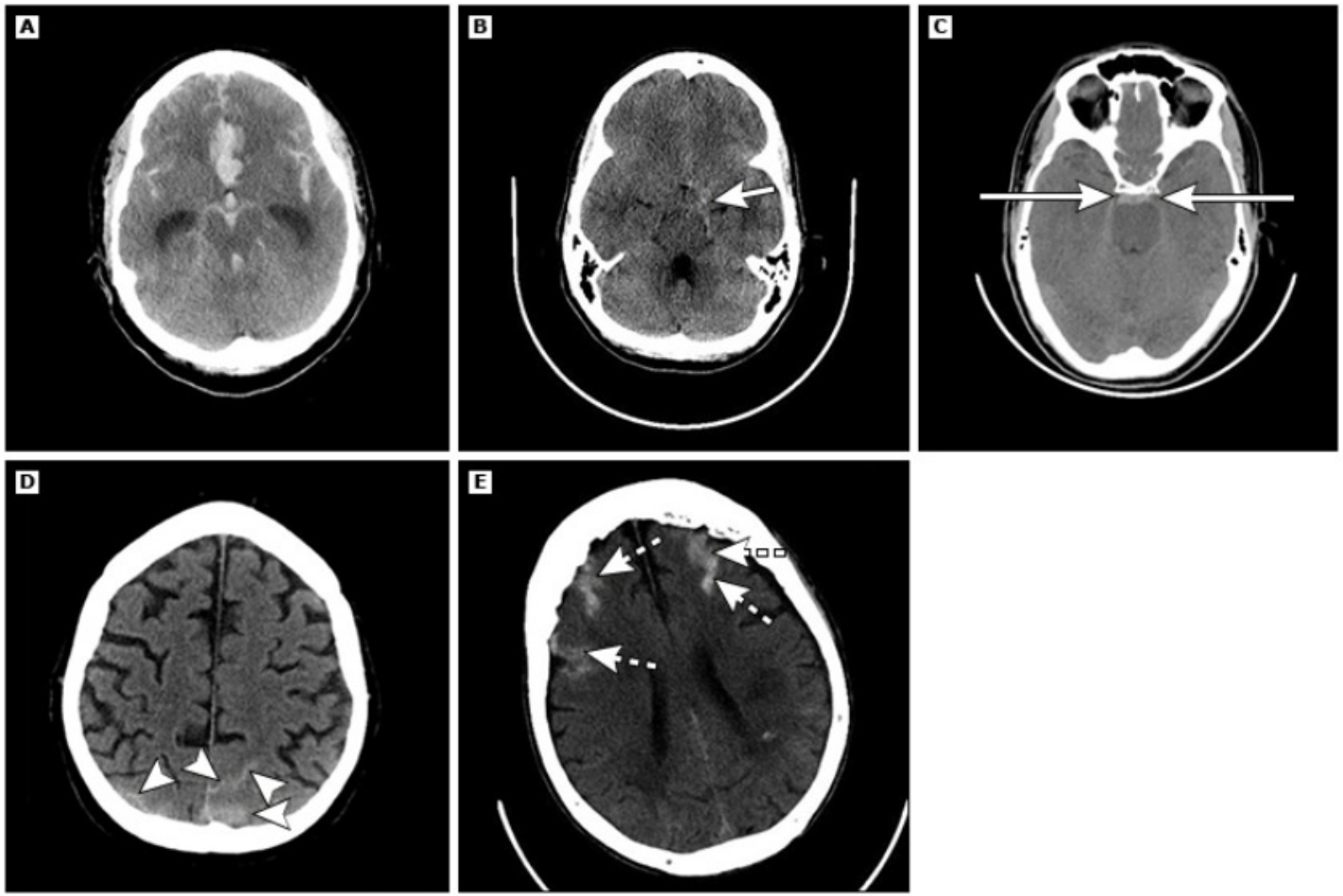
(Hemphill, et al., 2015)

Various Images of Subarachnoid Hemorrhage



(Edlow, 2018)

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Symptoms of Spontaneous Subarachnoid Hemorrhage

- **Sudden-onset, Severe Headache**
  - Typically described as “worst headache of life”
- **Associated Symptoms**
  - Brief loss of consciousness
  - Decreased level of consciousness
  - Confusion
  - Nausea/Vomiting
  - Neck pain or stiffness

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Management Strategies

Prevent Re-bleeding

- **Blood Pressure Management**
  - Goal SBP less than 140mm Hg for unsecured aneurysm
- **Endovascular management**
  - Coiling
- **Surgical intervention**
  - Clipping
- **Vasospasm**
    - Commonly see as focal changes in patient
    - Occur in as many as 50% of patients
      - Calcium Channel Blocker (Nimodipine)
      - Angioplasty
      - Verapamil IA

(Connolly, et al., 2012)

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Nursing Care

- Similar to spontaneous subarachnoid hemorrhage
- Neurological Assessment – early recognition of subtle changes
  - Monitoring for cerebral edema/increased intracranial pressure (ICP)
    - Early signs – decreased LOC (restlessness, confusion, change in orientation), headache, visual disturbances
    - Late signs are pupillary abnormalities, changes in BP (widening pulse pressure), heart rate (bradycardia), or changes in respiratory pattern
- Vital Signs – aggressive management of blood pressure per guidelines and orders

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Nursing Care Continued

- Seizure Precautions
  - As many as 25% of SAH patients will experience seizures
- Hydrocephalus
  - Acute Hydrocephalus occurs within the first 24 hours in 15%-87% of patients with SAH. Late or chronic hydrocephalus may develop 10 or more days after SAH due to a clot in the ventricles in 10-15% of patients.
  - EVD placement and drainage has been associated with improved neurologic outcomes
- Vasospasm
  - Vasospasm (narrowing) of the cerebral arteries occurs most frequently 7 – 10 days after aneurysm rupture and spontaneously resolves after 21 days. Vasospasm can cause ischemia and/or infarction of the surrounding brain tissue
  - Up to 70% of patients recovering from aneurysmal SAH will experience cerebral vasospasm, and up to 40% of patients with SAH will be symptomatic

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Nursing Care Continued

- **Complication Avoidance**
  - Aspiration Precautions – dysphagia screening prior to any PO
  - Infection
  - Bowel and Bladder regiment
  - Mobility – progressive mobility based on patient's condition and abilities
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Summary

- Early recognition and appropriate triage
- Early CT imaging
- Aggressive BP management
- Reversal agents as indicated
- Rapid transfer to higher level of care and Neurosurgical/Neuroradiology services

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