**COMPLICATION MANAGEMENT**

Examine patient   
ABC  
Obtain appropriate imaging (CT head)  
Check labs  
  
Fascia lata for repair of CSF leak

**Management of intraoperative brain swelling**  
**MECHANICAL**- elevate HOB  
- check ETT to make sure it is still in place (make sure patient did not accidentally get extubated)  
- make sure jugular veins are not kinked (turn head to midline, if possible)  
- hyperventilate to PCO2 30-35  
- emergently intubate patients that are undergoing awake craniotomies

**CHEMICAL**- mannitol (make sure Foley is not kinked after mannitol)  
- 3% NaCl  
- Lasix  
- ask anesthesia to place patient in burst suppression

**STRUCTURAL**- release CSF through cistern or existing ventriculostomy or   
 placement of intra-op EVD (always drape in Frazier burr hole for   
 prone cases)  
- use ultrasound to r/o intraparenchymal hemorrhage  
- expand craniotomy and convert to decompressive craniectomy  
- cyst drainage or tumor resection  
  
**Intraoperative brain swelling, possible etiologies**  
- intracerebral hemorrhage  
- remote extra-axial hemorrhage  
- impaired venous drainage  
- hypercarbia  
- hydrocephalus  
- severe edema following ischemic stroke or trauma

**Sinus bleeding**  
- elevate head   
- packing, pressure  
- direct repair  
- indirect repair/buttress suture  
- bypass/reconstruction  
- sacrifice as the absolute last, last, last option

**Air embolism**When there is a risk of air embolism (eg. sitting position, near sinus) place a central venous catheter and precordial Doppler  
- will see hypotension with a drop in CO2 and O2  
- gel foam ready  
- drop head  
- flood field with saline (4x4), find and occlude site of air entry  
- aspirate air from central line  
- rotate patient to left side down (trap air in right ventricle)  
- ventilate patient with 100% O2  
- discontinue nitrous oxide (may expand AE)  
- use pressors and volume expanders to maintain BP   
- wax bone

**Post-operative deterioration**  
- hematoma  
- seizure  
- hydrocephalus  
- pneumocephalus  
- infarct  
- worsening edema  
- vasospasm (esp. in SAH)  
- check labs

**Other complications**

Post-op airway obstruction in ACDF

ICA dissection after CEA

CSF leak during a transsphenoidal approach  
- Pack with fat and bone; consider lumbar drain

Aseptic meningitis  
- may be seen following epidermoid tumor resection

Abscess s/p craniotomy  
- discard bone flap!