2PO

Admit to SICU

Code Status ☐ Full Code ☐ DNR DHS

Diagnosis :_____

Condition _____

Allergies _____

HT_____cm WT_____kg

Start if Checked

☐ Consult _____

√ Vital signs/Neurologic Checks every 1 hr and pm

√ Notify MD of following change in clinical assessment

» Decrease in level of consciousness

» Decrease in motor strength in arm/leg

»Onset of aphasia (if dominate hemisphere)

» Worsening headache

Check☐ Left☐ Right groin for bleeding or hematoma.

Every 15 minutes times 4, then

Every 30 minutes times 4, then

Every 60 minutes times 2.

√ Check for presence of ☐ Posterial Tibial ☐ Doralis Pedis

☐ Other_____ pulse at the same time as above groin checks

Activity: ☐ Bed Rest

☐ Out of Bed after_____ hours post- procedure

√ Head of Bed at 30 degrees; maintain head/neck in neutral position

√ IV NS with 20 meq KCL/L at_____ mL/hr

Diet: ☐ NPO ☐ Clear Liquids ☐ Other _____

√ Intake/Output (Strict ongoing I/O hourly for fluid balance)

√ Temp sensing Foley to drainage

☐ Minamally invasive Hemodynamic Monitoring CVP/ScvO2 and use FloTrac® Arterial Line for calculated Cardiac Output

√ Nasal Gastric Tube to low continuous suction if on ventilator

√ Sequential Compression Stockings

√ Supplemental 02 to keep SaO2 equal to or greater than 94%

√ Incentive Spirometer every one hour while awake

√ Check blood glucose: If greater than 140, notify physician for Sliding Scale Insulin

√ Minimize stimulation: keep lights and noise decreased

Maintain systolic blood pressure greater than_____ mmHg and less than_____mmHg

Continuously Drain Ventriculostomy to head pressure _____ mmHg **(leave open to drain)**

LabsCXR/EKG/CT:

√ Daily CBC, ECMP, Serum Osmolality, Tyiglycericle (if on propofol)

√ ECMP, Serum Osmolality every 6 hours if patient receiving mannitol

√ ABGs every 12 hours and prn with changes in physiological status

√ Magnesium level every 6 hours if on Magnesium drip

√ Phenytoin level 30 minutes prior to 4th dose (if on Fosphenytoin). Hold 4th dose until level resulted/reviewed

Reason for Exam: Aneurysmal Subarachnoid Hemorrhage

√ Daily Transcranial Dopplers: Comments - **rule out vasospasm**

√ Upright Chest Xray every AM: Comments - **rule out pulmonary edema**

√ CT scan of brain without contrast in AM post procedure: Comments - **rule out infarct/hydrocephalus**

☐ CT scan of brain with Perfusion Scan

√ For Temperature equal to or greater than 38.5°C Culture: Blood x 2, Sputum and Urine (repeat every 48 hours unless other wise ordered)

☐ Surgical Repair ☐ Endovascular Repair

Ventriculostomy	yes	no
PbtO2 Monitor	yes	no
CBF Perfusion Monitor	yes	no

Medications: Start if Checked

☐ Esomeprazole (Nexium) 40 mg IVP daily or Omeprazole (Prilosec) 40 mg PO daily.

☐ Ranitidine (Zantac) 50mg IVPB every 8 hours or Ranitidine (Zantac) 150mg PO every 12 hours.

√ Acetaminophen 650mg every 4 hrs PRN PO, per rectum or nasogastric tube for temperature greater than 38.3° C

√ Ondansetron (Zofran) 4mg IVP every 4 hrs PRN nausea

☐ If nausea persists in 30 minutes after Zofran give Metoclopramide (Reglan) 10mg IVP. If nausea still persists in 30 min after Reglan, give Promethazine (Phenergan) 12.5 mg IVP. If nausea still persists in 30 min call Neurosurgeon/designee.

√ Critical Care Bowel Program

√ Nimodipine 60mg PO/NG every 4 hrs (clamp NG x 1 hr). If BP is less than 120 mmHg after 1st dose given, may divide dose 30mg every 2 hrs.

√ If sodium less than 130 mEq/L, start 3% Saline IV at 30mL/hr until sodium greater than 136 mEq/L (Hold for CVP greater than 16mmHg)

☐ Atorvastatin (Lipitor) 40mg PO/NG daily x 21 days.

☐ Fosphenytoin (Cerebyx): loading dose 15 mg/kg (round up to nearest 50 mg) infusion not to exceed 150 mg/min. Then Fosphenytoin (Cerebyx): 100 mg every 8 hours IVP for 7 days

☐ Levetiracetam (Keppra) 1000 mg IVPB over 15 min loading dose followed by 500mg IVPB over 15 min every 12 hours. Serum Sodium every 6 hours while receiving sodium

☐ If patient presents within 48 of aneurysmal rupture Magnesium Sulfate infusion 4gm/100mL run at 0.5gm/hr for 12 days. If on Ventilator hold drip for Magnesium greater than 4 mg/dL. Recheck Magnesium level in 6 hours and resume Magnesium drip when less than 4 mg/dL. If not on Ventilator hold drip for Magnesium 3.5mg/dL for 6 hours then recheck value. Restart drip when Magnesium is less than 3.5mg/dL

For Systolic BP lowering keep less than _____ mmHg

☐ Labetalol 10-20 mg IVP every 5 minutes pm x 4 doses (Hold if Heart Rate less than 60 per minute)

☐ Clevidipine (Cleviprex) IV infusion (drip conc = 0.5 mg/mL). Start at 2 mg/hr (Rate = 4 mL/hr). Titrate every minute to keep SBP at target to max of 32 mg/hr. Do not use for more that 72 hours.

☐ Nicardipine (Cardene) IV infusion (standard drip conc = 0.2 mg/mL): Start at 5mg/hr (Rate = 25 mL/hr). Titrate 2.5-5mg/hr increments every 5 minutes to maximum of 15 mg/hr (Rate = 75mL/hr).

For Systolic BP raising keep greater than _____ mmHg

☐ Phenylephrine 0.1-2mcg/kg/min IV- Titrate to maintain systolic BP within defined parameters.

☐ Dopamine 5-10 mcg/kg/min IV- Titrate to maintain systolic BP within defined parameters.

Date _____ Time _____ Physician Signature and Number _____

Cottage HEALTH SYSTEM

ANEURYSMAL SUBARACHNOID HEMORRHAGE POST-PROCEDURE ORDERS

Medications cont: Start if Checked

☐ ASA 81 mg every day PO/NG
☐ Clopidogrel (Plavix) 75mg every day PO/NG
☐ Call MD day 3 and obtain appropriate anticoagulation orders
☐ Heparin Drip titrate to maintain PTT 45-60 seconds.
Start drip at _____ (time) at 800 units/hr.
Check PTT 4 hours and Call MD for further orders if out of range.
Recheck PTT every 4 hours after change in drip made
☐ Desmopressin (DDAVP): _____ mcg (usual dose 2 mcg or 4 mcg) subcutaneous every 6 hrs for urine output greater than 400 mL per hr x 2 hrs (Hold for serum sodium less than 136 mEq/L.
☐ Hydrocodone/APAP (5mg/325mg) 1 tablet PO every 4 hours as needed for mild pain/headache (pain scale 1-3)
☐ Hydrocodone/APAP (5mg/325mg) 2 tablets PO every 4 hours as needed for moderate pain/headache (pain scale 4-6)
☐ Morphine 2 mg IVP every 2 hours as needed for severe pain/headache (pain scale 7 or greater)
☐ Hydromorphone (Dilaudid) 0.5-2 mg IV every 2 hours as needed for moderate/severe pain/headache (pain scale 4 or greater)
☐ Cefazolin (Ancef) 1 gm IVPB every 8 hours for _____ doses
☐ Vancomycin 1 gm IVPB every 12 hours for _____ dose

ORDERS END HERE IF NOT ON VENTILATOR

If on a Ventilator **has Ventriculostomy and PbtO2 or CBF Perfusion sensor**

Analgesia/Sedation: **(see SAD protocol).**

☐ Morphine IV infusion starting at 2mg/hr and titrate up to 10 mg/hr for a Behavioral Pain Scale 3
☐ Midazolam (Versed) IV infusion starting at 1mg/hr and titrate to 5mg/hr for deep sedation
☐ Propofol starting at 10 mcg/kg/min and titrate up to 50 mcg/kg/min IV infusion if **ICP greater than 20 or if PbtO2 less than 20mmHg or if CBF Perfusion less than 20mL/100g-min** respective of monitor type
☐ Neuromuscular Blockade as needed for ICP control, shivering and or ventilator control.
Cisatraurium (Nimbex) continuous infusion: 1st bolus 0.2mg/kg (from vial) followed by continuous drip starting at 0.5mcg/kg/min. May titrate to maximum of 10 mcg/kg/min to maintain 2/4 train of four (TOF). While on Neuromuscular blocker check/document TOF every one hour. In the event that TOF is less than 2/4 turn drip off for one hour then recheck. Resume drip when TOF is 2/4 at ½ last dose and continue to check TOF every hour and follow previous directions
☐ Maintain temperature 36-37° C, temp greater than 38.5° C pan-culture and will consider **Intra Vascular cooling System**
√ Resting ankle splints/heal protectors
√ **FI02 challenge** every 12 hours if patient has **PbtO2 or CBF Perfusion sensor:** Ventilator to 100% FI02 for 15 min document peak sensor values

Titrate PaCO2 to keep ICP less than 20 mmHg and PbtO2 mmHg **greater than** 20mmHg and/ or CBF **perfusion greater than** 20mL/100g-min. Target PaCO2 34-40 mmHg. Avoid hyperventilation

Keep ICP less than 20mmHg and PbtO2 greater than 20mmHg or CBF Perfusion greater than 20mL/100g-min.

Determine optimal CPP (evidenced by ICP less than 20mmHg and PbtO2 greater than 20mmHg or CBF Perfusion greater than 20mL/100g-min) Target CPP is between 60-80 mm Hg. When out of range:

1st address volume:
- Keep CVP 6-10 mmHg with 250 mL Normal Saline IV fluid challenge over 15-20 min. as needed to achieve set parameters.
- After 1 liter of Normal Saline if target CVP not reached give **5% Albumin 250mL** IV over 15-30 min (continue use of Albumin for 30 days). Repeat every 4 hours until target CVP is reached.
- Administer **Packed RBCs** IV to increase Hematocrit to greater than 30%. (if PbtO2 less than 20 mmHg or if CBF Perfusion is less than 20mL/100g-min)

2nd Once CVP is within range and CPP less than 60mmHg **add vasopressors:**
- Phenylephrine (Neosynephrine) 0.1-2 mcg/kg/min titrate to achieve set parameter. (if Neosynephrine has reached 2 mcg/kg/min and set parameter is not met, augment with dopamine)
- Dopamine 5-10 mcg/kg/min titrate to achieve set Parameter

LICOX	HEMEDEX
If PbtO2 less than 20 mm Hg test response to 100% F102 for 15 min while manipulating other parameters. If no change in PbtO2 notify Neurosurgeon or designee. If rise in PbtO2 noted, maintain 100% FI02 until PbtO2 is greater than 20mmHg then titrate FI02 to maintain PbtO2 greater than 20mmHg and SaO2 at 100.	**CBF Perfusion is less than 20mL/100g-min.** Test response to 100% FI02 for 15 min while manipulating other parameters. If no CBF Perfusion notify Neurosurgeon or designee. If rise in CBF Perfusion noted, maintain 100% FI02 until CBF Perfusion is greater than 20mL/100g-min, then titrate FI02 to maintain CBF greater than 20mL/100g-mmin and SaO2 at 100.

ICP continues to be greater than 20mmHg:

☐ Hypertonic Saline 3% 250 ml over 20 minutes every 4 hours while ICP greater than 20mmHg. Hold for Serum Sodium less than 134mEq/L or greater than 155 mEq/L. Serum Sodium every 6 hours while receiving sodium.
☐ Mannitol 0.5-1.25 gm/kg IV bolus every 6 hrs followed by 250mL NS over 1 hour if; keep serum osmo less than 315 mOsm/kg and maintain euvolemia. Hold Mannitol if Sodium is 155mEq/L or greater.
☐ May alternate Mannitol and Hypertonic Saline

Date _____ Time _____ Physician Signature and Number _____

Cottage HEALTH SYSTEM

ANEURYSMAL SUBARACHNOID HEMORRHAGE POST-PROCEDURE ORDERS

Vasospasm Orders:

Transcranial Doppler (TCD) every AM: Call Neurosurgeon if
50% increase in velocity noted by TCD or if PbtO2 is less than 20mmHg or decreases more than 25% of patient's normal Or if CBF Perfusion is less than 20mL/100g-min or if decreases more than 25% of patient's normal. Print out both values every 24/hr.

☐ CT brain Perfusion Study

Fluid Management as follows:

☐ CVP 8-12 mmHg with Normal Saline at 150mL/hr

☐ CVP 12-16 mmHg with Normal Saline at 175mL/hr

If target CVP not reached within 2 hours of Normal Saline give 5% Albumin 250mL IV over 15-30 min (continue use of Albumin for 30 days) . Repeat every 4 hours until target CVP is reached.

Once CVP is within range add vasopressors:

Maintain Systolic BP as follows: (maintain mild/moderate hypertension)

☐ 140-160mmHg;

☐ 160-180 mmHg;

Phenylephrine (Neosynephrine) 0.1-2 mcg/kg/min
titrate to achieve set parameter
(If Phenylephrine has reached 2 mcg/kg/min and set parameter is not met augment with dopamine)

Dopamine 5-10mcg/kg/min to achieve set parameter

Date _____ Time _____ Physician Signature and Number _____