NORTHWEST COMMUNITY EMERGENCY MEDICAL SERVICES SYSTEM

EST 1972

# Jan 2017


# Continuing Education

## Stroke & SOP Q & A

The class objectives are on the cover of the independent reading material handout.

Review particularly the following elements of that packet:

- Risk factors for stroke and elements of the PMH that may contribute to stroke
- Medications that patients with high risk for stroke may be taking; especially the various anticoagulants.
- Difference in history and presentation of anterior vs. posterior strokes
- Unique presentation of subarachnoid hemorrhage/aneurysms
- Assessment of a patient with possible stroke with an emphasis on
    - Mental status exam
    - Cranial nerves
    - Limbs: motor and sensory exams
    - Other findings: neck stiffness; vomiting without nausea, SNS abnormalities (sweating on one side)
- Apply the SOP decision tree for selecting a receiving hospital: Comprehensive vs Primary stroke center

Class participants will divide into 6 groups.

Use the NWC EMSS Stroke Alert / Exam PREHOSPITAL CHECKLIST (last page of ISM) and the ISM content to create a mind map of your assigned patient. You have 10 minutes to create a full patient profile meeting the type of stroke and destination hospital assigned. You will present your “case” to the class for discussion.

The full neuro exam skills sheet for stroke as posted in the System procedure manual is attached as the first pages of this handout as an FYI.

The last portion of the class is designed to go through the questions submitted relative to the new SOPs and Dr. O’s answers

It is our goal that all EMS practitioners are well-informed about the evidence-based care in the new protocols, but also are able to translate this knowledge into clinical practice.

Please let us know if you have any further questions, and we will be happy to answer them.

Connie Mattera, MS, RN, EMT-P
EMS Administrative Director

**NWC EMSS/NCH Paramedic Program**

# Neuro Assessment: Stroke

| Name: | Lab Buddy: |
|---|---|
| Date: | # attempts: |

**Instructions to the participant:** You have 10 minutes to assess the patient, verbalize the prehospital interventions that are indicated and determine the most appropriate receiving hospital (Comprehensive or Primary Stroke Center).

| Performance standard | YES | No |
|---|---|---|
| * Scene size up/safety; Determine nature of illness; scan environment for clues; apply appropriate BSI | | |
| Determine need for additional assistance | | |
| **PRIMARY ASSESSMENT**<br>***Airway**: Assess for impairment and assure patency<br>☐ Manual airway maneuvers if needed<br>☐ Verbalize if adjuncts are needed for airway access/control (BLS or ALS)<br>☐ Aspiration risk? Verbalize seizure/vomiting precautions; suction would be standing by | | |
| **Breathing**/ventilatory/gas exchange status; assess for impairment<br>☐ *Assess for spontaneous ventilations; general rate (normal, fast or slow)<br>☐ *Assess depth; effort/WOB; accessory muscle use<br>☐ Assess position, adequacy of air movement, symmetry of chest expansion, retractions<br>☐ Lung sounds if in ventilatory distress<br>☐ ***Assess gas exchange;** apply $SpO_2$ monitor; assess for hypoxia, cardiorespiratory or neurological compromise. Note before & after $O_2$ if able. Note signs of hypoxia<br>☐ *Assess $ETCO_2$ number& waveform if possible ventilatory, perfusion, metabolic compromise Verbalize if ventilatory assistance is needed w/ BVM | | |
| ☐ ***Correct hypoxia/**assure adequate ventilations: Target $SpO_2$: 94%. If ≥94%: NO Oxygen<br>☐ **$O_2$ 1-6 L/NC**: Adequate rate/depth; minimal distress; $SpO_2$ 92%-94% (88%-91% COPD)<br>☐ **$O_2$ 12-15 L/NRM:** Adequate rate/depth: mod/severe distress; $SpO_2$ < 92%; (<88% COPD)<br>☐ **$O_2$ 15 L/ BVM:** Apnea and/or shallow/inadequate rate/depth with moderate/severe distress; unstable. Adults: 1 breath every 6 sec (10 breaths/minute) | | |
| **Circulatory** status; assess for impairment<br>☐ *Pulses for presence, general rate/quality/rhythmicity<br>☐ Skin (color, temperature, moisture, turgor)<br>☐ *Verbalize need for ECG monitor: rhythm ID and 12 L for evidence of acute/old changes<br>☐ *Assess need for immediate IV (DAI, hypoglycemia, hypotension); defer most IV starts to enroute<br>☐ Verbalize OLMC may request lg. bore antecubital IV as CT prep; NS TKO | | |
| **Disability: explore causes of AMS**<br>☐ If generalized tonic/clonic seizure activity: Observe and record per SOP p. 37<br>☐ **MIDAZOLAM** usual dosing for seizures<br>☐ *Assess glucose level (verbalizes)<br>☐ If hypoglycemic**: D10%** per SOP<br>☐ *Assess GCS: Eyes Verbal; Motor Total: | | |
| **Exposure/environment**<br>☐ Discretely undress pt to inspect approp body areas ☐ Protect pt modesty, maintain body warmth | | |
| **SECONDARY ASSESSMENT**<br>**Vital signs**<br>☐ *BP/MAP: ☐ *Pulse: ☐ Resp: ☐ Temperature | | |
| **Obtain chief complaint:**<br>☐ Severe HA ☐ Weakness, heaviness, paralysis of face/extremity<br>☐ Vomiting ☐ Visual disturbance ☐ Dizziness/vertigo ☐ Sensory changes<br>☐ Balance problems/incoordination ☐ Speech difficulties: | | |
| **History of present illness**<br>☐ *Onset (suddenly) ☐ Severity<br>☐ Provocation/palliation ☐ ***Time last seen well (normal for them)** <3.5; 3.5-6; or > 6 hours<br>☐ Quality ☐ Clarifying questions re: assoc. complaints<br>☐ Region/radiation ☐ Date of birth ☐ Approx. wt | | |
| **SAMPLE history**: *Allergies (meds, environment, foods) | | |

| Performance standard | YES | No |
|---|---|---|
| ***Medications**<br>**Anti-hypertensive agents**: ☐ ACE Inhibitor ☐ Beta blocker ☐ Diuretics; ☐ ARB; ☐ $Ca^{++}$ blocker<br>☐ Other anti-hypertensives; ☐ None<br>**Cholesterol reducing drugs**: ☐ Statin ☐ Niacin ☐ Fibrate ☐ Absorption Inhibitor; none<br>☐ **Anticoagulants:** warfarin/Coumadin; apixaban/Eliquis; argatroban; dabigatran/Pradaxa; desirudin/Iprivask; edoxaban/Savaysa; enoxaparin/Lovenox; fondaparinux/Arixtra; *full dose LMW heparin; lepirudin (Refludan); rivaroxaban / Xarelto<br>☐ Platelet inhibitors: Aspirin; clopidogrel / Plavix; ASA/dipyridamole / Aggrenox; prasugel / Effient; ticagrelor / Brilinta; ticlopidine (Ticlid)<br>☐ **Diabetic drugs**; ☐ Insulin; ☐ Oral agents; ☐ Other subcutaneous/injectable agents<br>☐ Antidepressants Cocaine and other vasoconstrictors, e.g. amphetamines: PCP (Phencyclidine AKA angel dust, ozone, wack, rocket fuel)<br>☐ Oral contraceptives; hormone replacement therapy (HRT)<br>☐ **Others:** | | |
| **Past Medical History**<br>☐ None ☐ A-Fib/Flutter ☐ AV malformation, tumor, aneurysm<br>☐ Bleeding disorders: Protein S & C deficiency; Sickle cell disease; Polycythemia; Hemophilia<br>☐ CAD/Prior MI: Heart/vascular disease ☐ Carotid stenosis<br>☐ Current Pregnancy (or up to 6 weeks post- partum)<br>☐ Depression ☐ Diabetes ☐ Drugs/Alcohol Abuse ☐ Dyslipidemia<br>☐ Family hx stroke ☐ HF ☐ HRT ☐ Hypertension<br>☐ Migraine ☐ Obesity ☐ Previous stroke ☐ Previous TIA:<br>☐ Previous intracranial surgery/bleed ☐ Serious head trauma ☐ *Prosthetic valve<br>☐ PVD ☐ Renal failure ☐ Sleep apnea ☐ Smoker<br>☐ Other: | | |
| **Last oral intake** | | |
| **Event surrounding this incident** | | |
| **Quick stroke screen**<br>☐ ***Assess for abnormal speech**: ("You can't teach an old dog new tricks")<br>☐ Dysarthria (right words, slurred) ☐ Expressive aphasia ☐ Receptive aphasia | | |
| **Head**<br>☐ *Ask about double vision; vertigo, dizziness, photophobia or sound sensitivity<br>**Cranial nerves**: Note if loss/deficit on Rt – Left- or both; describe deficits<br>☐ *Visual acuity ☐ Visual fields ☐ *EOMs (gaze palsy)<br>☐ *Pupil size, shape, equality ☐ Facial sensation ☐ Hearing deficit<br>☐ *Pupil reactivity to light ☐ ***Facial weakness** (show teeth, raise eyebrows, close eyes)<br>☐ Hoarse voice ☐ Gag ☐ Stick out tongue | | |
| **Chest**<br>Auscultate breath sounds | | |
| **Abdomen/pelvis** - in correct order<br>☐ Inspect (contour) (verbalizes) ☐ Palpate (guarding. rigidity) | | |
| **Lower extremities**<br>☐ Palpate ☐ Assesses SMV status of each limb<br>R L<br>☐☐ *Weakness (leg drift)<br>☐☐ *Ataxia: Have pt run heel of one foot down shin of opposite leg<br>☐☐ ***SENSORY Normal; partial, severe** deficit (describe) | | |
| **Upper extremities**<br>☐ Palpate ☐ Assesses SMV status of each limb<br>R L<br>☐☐ *Weakness (arm drift; some efforts against gravity; no effort against gravity; no movement)<br>☐☐ *Ataxia: Ask pt to perform rapid alternating movement or touch finger to nose (light on an object)<br>☐☐ ***SENSORY Normal; partial; severe** deficit (describe) | | |
| **Skin: Integumentary assessment** (integrated above) color (variation), moisture, temp, texture, turgor, lesions/breakdown; hair distribution; nails (clubbing) | | |

| Performance standard | YES | No |
|---|---|---|
| **Psychological/social assessment** | | |
| ***Correct paramedic impression**: (Acute stroke) | | |
| **Verbalize treatment plan**<br>☐ *Maintain head/neck in neutral alignment; do not use pillows.<br>☐ Aspiration precautions: Elevate head of bed 10° - 15°.<br>☐ Provide comfort & reassurance<br>☐ *Limit activity; do not allow walking; protecting limbs from injury. | | |
| **Decision tree for transport: Patient presents with S&S new onset stroke**<br>☐ Unstable? → Nearest hospital<br>☐ **Comprehensive** Stroke Center (either of top two criteria, then consider travel time)<br>☐ Onset 3.5 - 6 hours<br>☐ GCS ≤8 or severe HA or anticoagulant use w/in 48 hrs or PMH of ICH/aneurysm<br>☐ Travel time ≤30 min scene to CSC<br>☐ **Closest Stroke Center (Comprehensive or Primary)**<br>☐ Onset <3.5 or > 6 hours with acute S&S of stroke<br>☐ Criteria for Comprehensive, but > 30 minutes from closest CSC | | |
| **Critical Criteria - Check if occurred during an attempt** | | |
| Failure to initiate or call for transport of the patient within 10 minute time limit | ☐ | ☐ |
| Failure to take or verbalize body substance isolation precautions | ☐ | ☐ |
| Failure to determine scene safety before approaching patient | ☐ | ☐ |
| Failure to voice and ultimately provide appropriate oxygen therapy | ☐ | ☐ |
| Failure to assess/provide adequate ventilation | ☐ | ☐ |
| Failure to find or appropriately manage problems associated with airway, breathing, hypoperfusion | ☐ | ☐ |
| Does Secondary assessment before assessing and treating threats to airway, breathing, and circulation | ☐ | ☐ |
| Failure to determine the primary problem/accurately do stroke screen and recognize stroke equivalents | ☐ | ☐ |
| Uses or orders a dangerous or inappropriate intervention | ☐ | ☐ |
| Exhibits unacceptable affect with patient or other personnel | ☐ | ☐ |

***Factually document below your rationale for checking any of the above critical criteria.***

_____

_____

_____

_____

**Scoring:** All steps must be independently performed in correct sequence with appropriate timing and all starred (*) items must be explained/ performed correctly in order for the person to demonstrate competency. Any errors or omissions of these items will require additional practice and a repeat assessment of skill proficiency.

**Rating: (Select 1)**

☐ **Proficient**: The paramedic can sequence, perform and complete the performance standards independently, with expertise and to high quality without critical error, assistance or instruction.

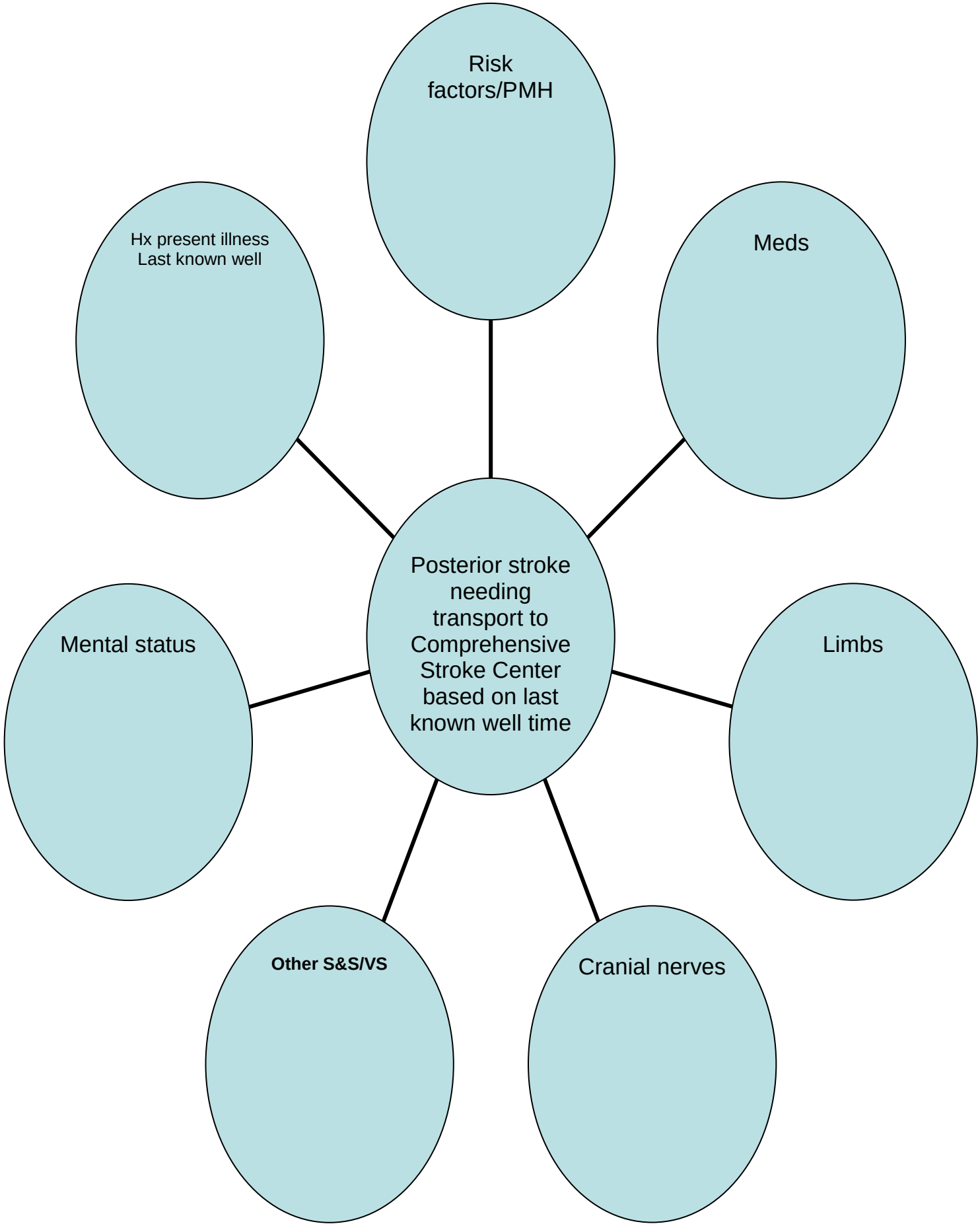
☐ **Competent:** Satisfactory performance without critical error; minimal coaching needed.

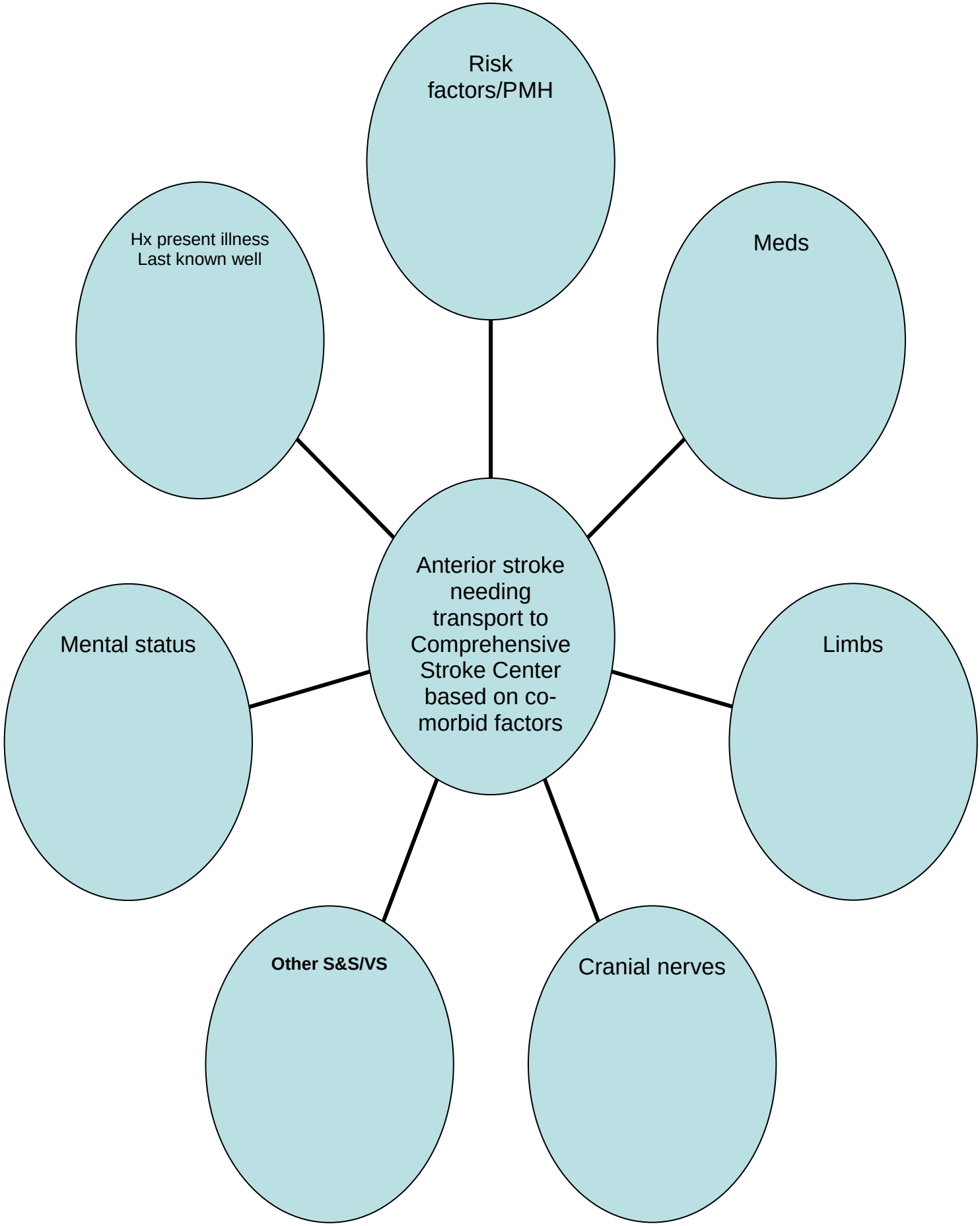
☐ **Practice evolving/not yet competent:** Did not perform in correct sequence, timing, and/or without prompts, reliance on procedure manual, and/or critical error; recommend additional practice

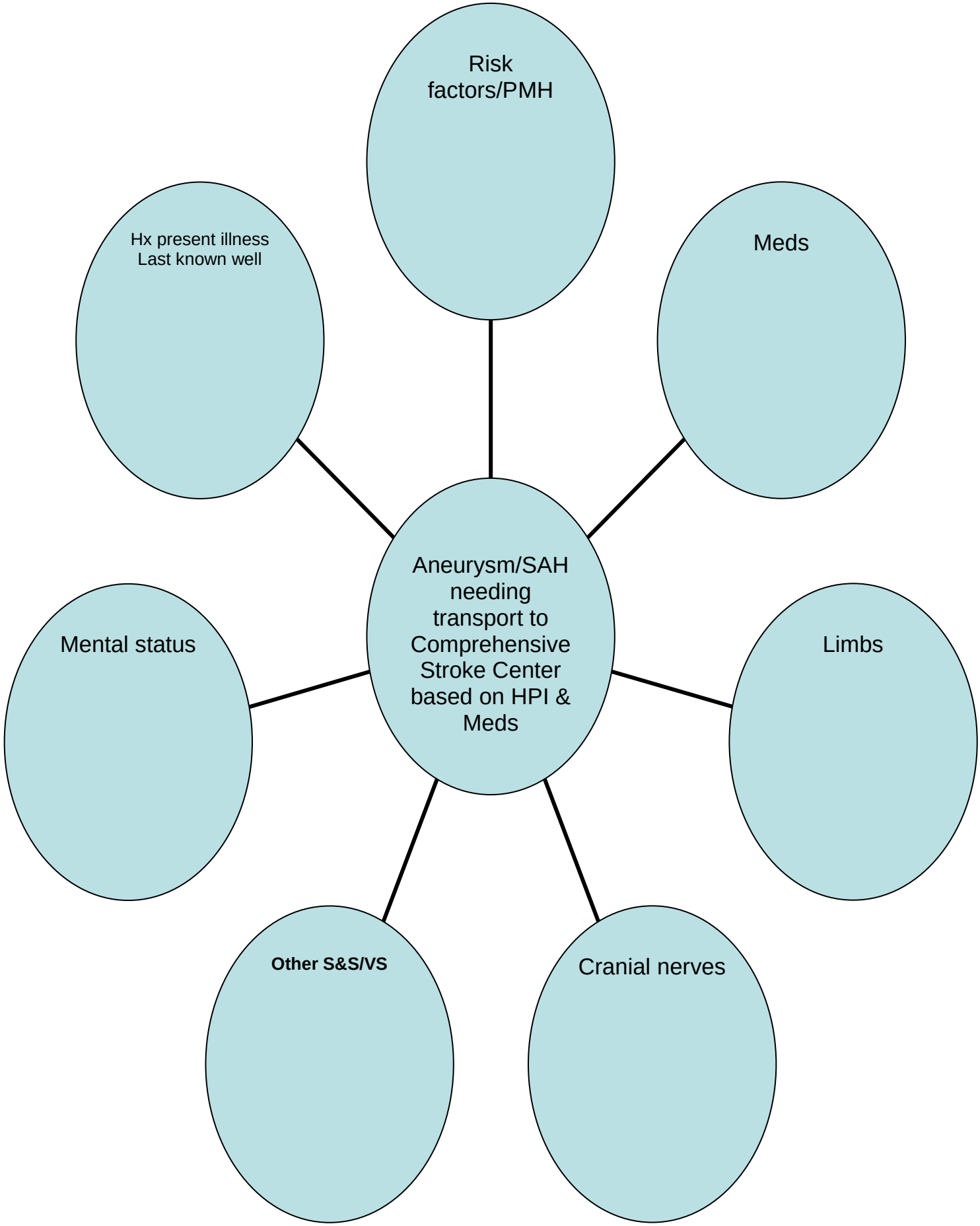
CJM 12/16

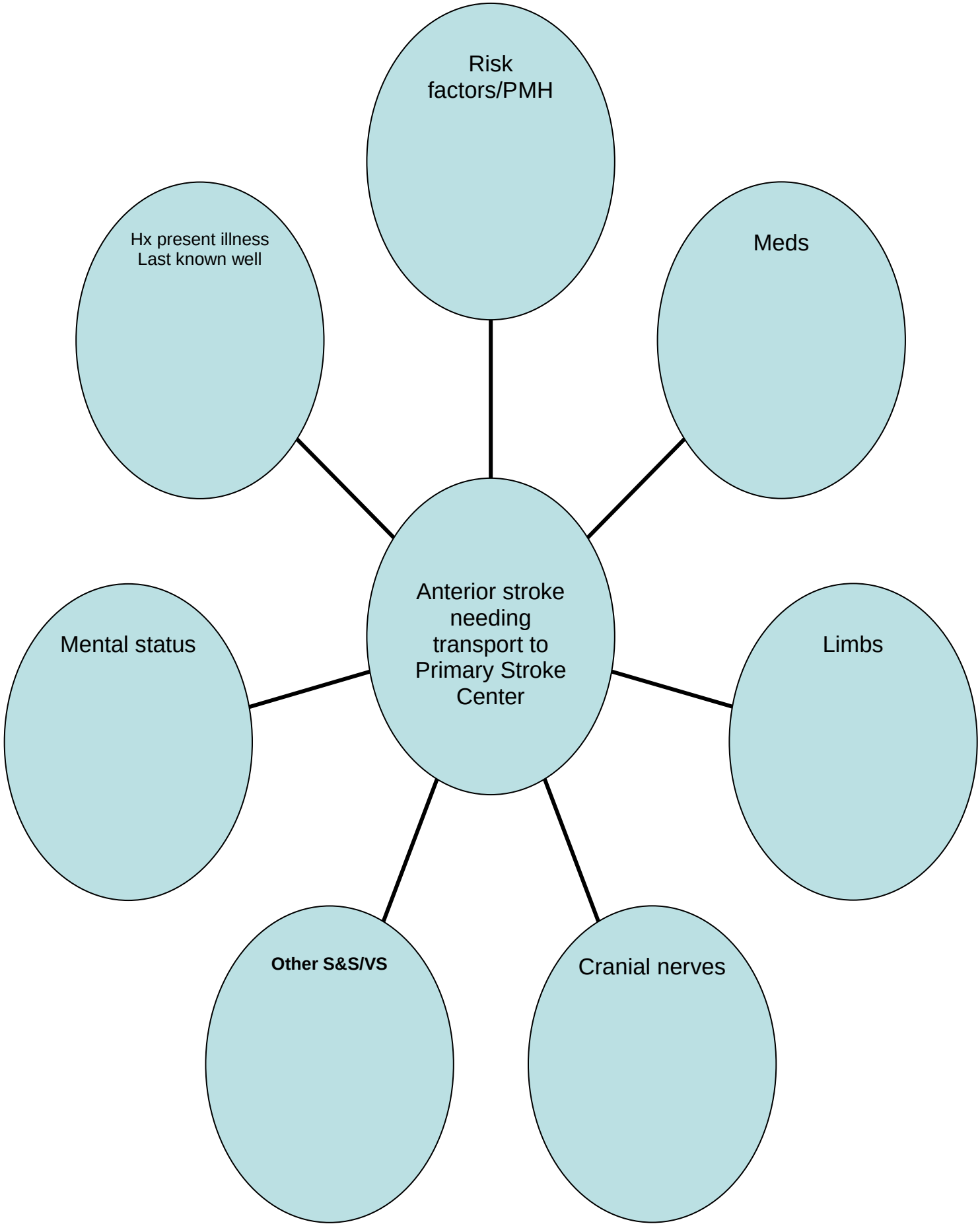
_____

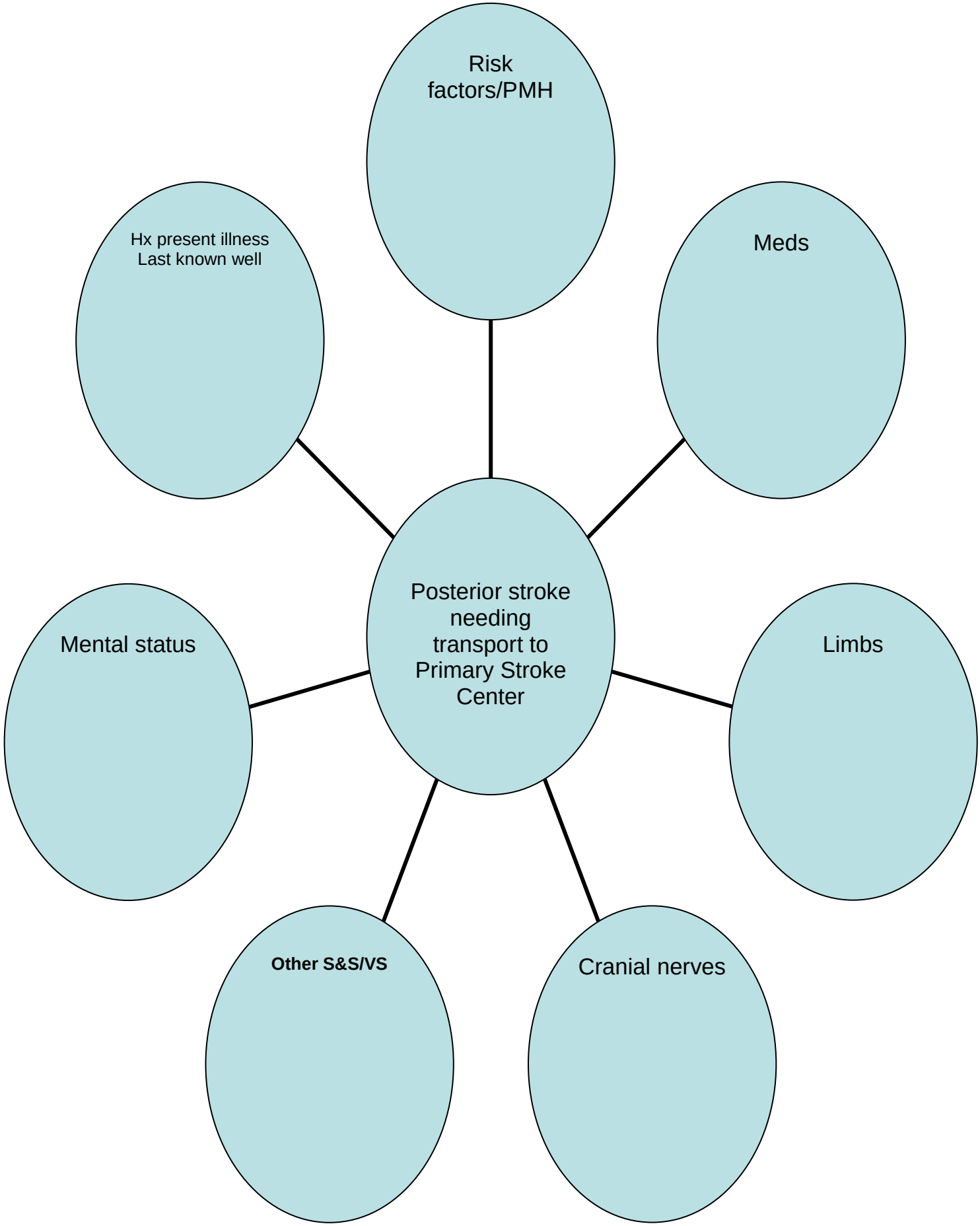
Preceptor (PRINT NAME - signature


Risk factors/PMH
Hx present illness
Last known well
Meds
Posterior stroke needing transport to Comprehensive Stroke Center based on last known well time
Mental status
Limbs
Other S&S/VS
Cranial nerves


Risk factors/PMH
Hx present illness
Last known well
Meds
Anterior stroke needing transport to Comprehensive Stroke Center based on co-morbid factors
Mental status
Limbs
Other S&S/VS
Cranial nerves


Risk factors/PMH
Hx present illness
Last known well
Meds
Aneurysm/SAH needing transport to Comprehensive Stroke Center based on HPI & Meds
Mental status
Limbs
Other S&S/VS
Cranial nerves


Risk factors/PMH
Hx present illness
Last known well
Meds
Anterior stroke needing transport to Primary Stroke Center
Mental status
Limbs
Other S&S/VS
Cranial nerves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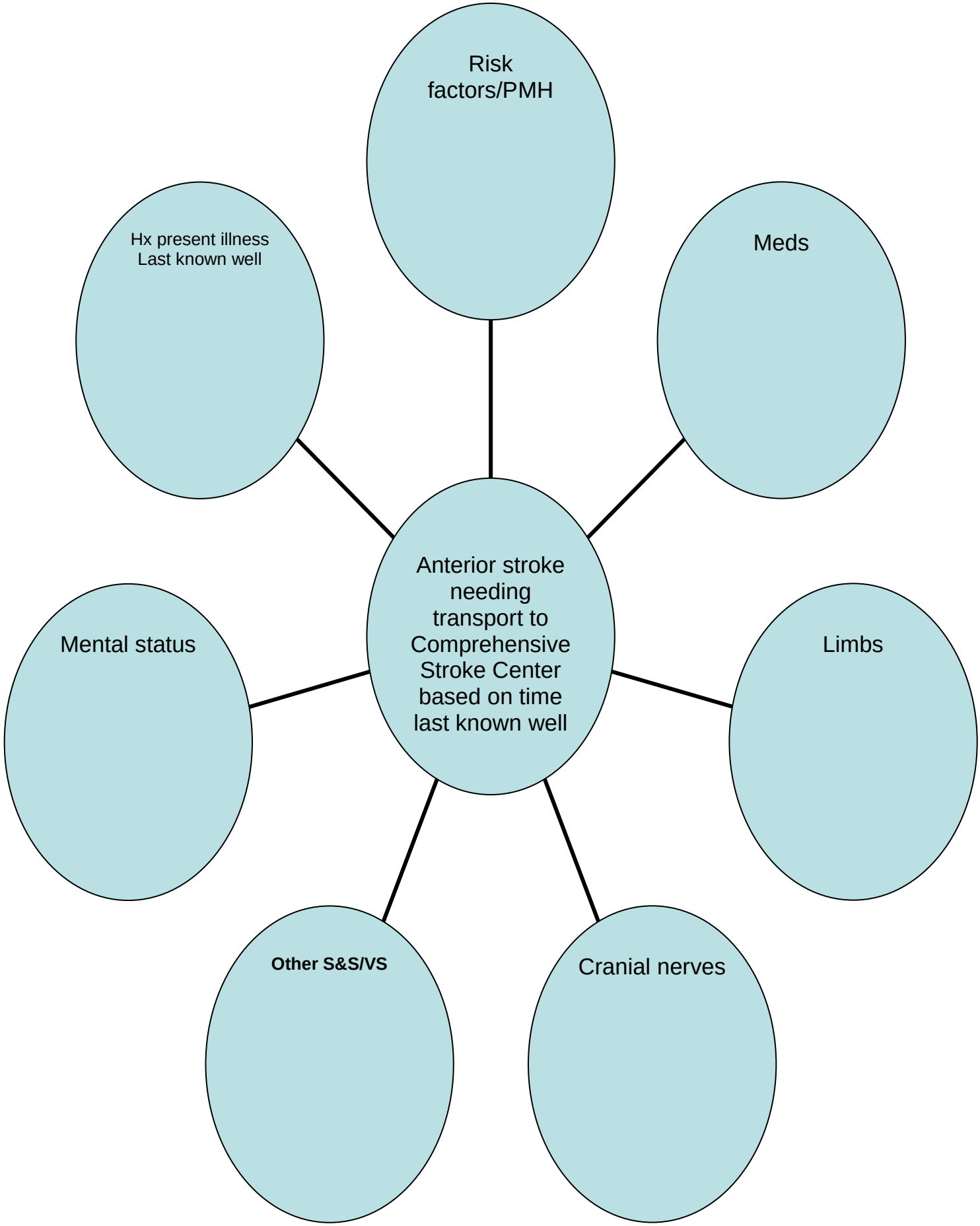
Cranial nerves


Risk factors/PMH
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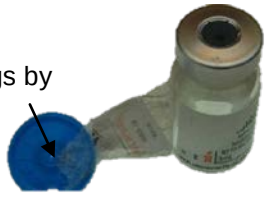
Other S&S/VS
Cranial nerves

# 2016 SOP - Ask the EMS MD Q&A

| SOP section | Questions and Answers |
|---|---|
| **EMS Scopes of Practice** | ***Q: With the upcoming changes in scopes of practice for the EMTBs, does that impact the ALS release of care if a BLS provider is initiating the care?***<br>A: Yes. A refusal of care is categorized as ALS or BLS depending on the level of care needed, given to or refused by the patient. Putting those new levels of care into effect will only happen as EMTs receive education and are credentialed to provide care that has previously been defined as ALS, but is now BLS in the new SOPs. We expect a time of transition on this throughout the System (and State) as EMTs receive education and have their scopes of practice expanded. Whether a refusal is ultimately categorized as ALS or BLS will need to be considered on a case by case basis depending on the care given to the patient and the authorized scope of practice of the responding team members.<br>***Q: When a 12L & cardiac monitor is entered for the patient, Elite will not make this an ALS run. How do we change that?***<br>A: Will address with CARS committee. Acquiring a 12 L is now considered BLS after the EMTs have been competencied, but interpreting a rhythm or 12L is still ALS. This needs to be a multi-select box moving forward. |
| **General patient assessment and IMC**<br>**pp. 3&4** | ***Q: Has the System elected to remove regular nasal cannulas for oxygen delivery in favor of using all capnography cannula sensors?***<br>A: No. If a patient's condition indicates the need for $ETCO_2$ monitoring (ventilation, perfusion or metabolic deficits), we encourage the use of the nasal cannula sensor in spontaneously breathing patients. Otherwise, traditional $O_2$ NCs are still approved on the Drug & Supply List.<br>***Q. A King tube that is used to secure an airway is NOT considered an intubation or advanced airway? Does it also require the need to have capnography available to use a King? All of our MedEngines do not have monitors with the capability of monitoring capnography. Or will that still be an acceptable practice with the knowledge that an ambulance will be on scene shortly after? Are we going to have to pull all the airway supplies (other than BLS adjuncts) off of engines if we are unable to get capnography monitors***?<br>A. A King airway is considered an advanced airway in the NWC EMSS.<br>By System procedure, it needs to have proper placement confirmed by end tidal $CO_2$ (quantitative waveform capnography) on all ALS ambulances.<br>M9 policy (MedEngines) allows an $ETCO_2$ detector or capnography to confirm King placement – therefore if you have the colorimetric devices to detect $ETCO_2$, you are meeting standards.<br>There should be no ET tubes on an ALS engine (except by waiver). Laryngoscope blades are authorized on all for direct laryngoscopy and FB removal with Magill forceps.<br>***Q: Why does the system prefer ampules for fentanyl?***<br>  <br>**A:** On a national basis, fentanyl is one of the more commonly tampered drugs by EMS personnel. Safe practice guidelines recommend using ampules to avoid the possibility of drug diversion. Photo is of a vial of fentanyl replaced with water. There is a pinhole puncture in the cap center where a small needle was inserted to withdraw the drug. We encourage providers to carefully inspect all drug packaging before preparing for patient use to ensure the 6 Rs of med administration. Vials are OK if that is what a hospital stocks; careful vigilance is needed. |
| **Emergency Drugs**<br>Fentanyl, norepinephrine and ketamine on Medengines | Q: ***What's the rationale for adding fentanyl and norepinephrine to the ALS Med Engines? I know we had taken the narcotics off years ago due to the fact that an ambulance would be there shortly to administer if needed. Is ketamine being added to the Med Engines for excited delirium only, since they are not intubating unless they have a waiver?***<br>A: Fentanyl was added back because the ambulances are not always there before folks with fractures need to be moved and we have System members on waivers right now allowing them to carry it on non-transport vehicles. We had huge push back when it was removed. Same reason for the norepinephrine. When folks need it, they need it now, not when an ambulance can arrive. Ketamine is being added for excited delirium as an urgently needed first line drug. |

| SOP section | Questions and Answers |
|---|---|
| | ***Q: Keep the albuterol for crush, but give us Duonebs for simplicity.***<br>A. This is an area we will be watching this year. Albuterol alone is needed not only for crush, but also for hyperkalemia in all circumstances where an IV may not be placed or based on OLMC order. We will monitor use data when one or both are given and also do a cost comparison on each drug separately vs. the Duoneb formulation. The determination to add ipratropium to all nebs on all patients was not made until right before the protocols were issued. We'll know within a couple of months if we should change out how it is carried on the rigs. |
| **Withholding or Withdrawing Resuscitative Efforts** | ***Q: There are some hospice agencies telling family members to take a picture of the form and keep it on their cell phone to show the ED or EMS. Is that legal and how should we transmit the picture to OLMC if they want to see it? While hospital radios are set up to receive 12 leads, there may be IT issues if we are having the email address used by non EMS providers to send things to the ED.***<br>A: That is not the intent of the law. Phone app copies are not mentioned in the EMS Rules. In order for a contract or agreement to be legal and binding, a full copy of it must be available for viewing at one time and in one document so there is no chance that a portion of it could have been adulterated, modified or changed without knowledge. On the **Illinois POLST website** under their Q&A, they answer the following: "The original document should remain with the patient at all times, even during transfers. However, copies of a valid form are acceptable." If EMS is presented with a cell phone photo of the 1st two pages of the POLST (or older DNR) form. Call OLMC and explain the patient's situation. We really need to find the hospice folks that are saying this and ask them to ensure that full forms are with the patients at all times.<br>***Q: A King airway is considered an advanced airway by our EMS System. What if it is not specified in the POLST form? Can it be inferred?***<br>A. Yes. If they don't want to be intubated, we should not insert a King.<br>***Q: If a patient has a POLST form with comfort care marked, and EMS has given IV fluids and/or IV fentanyl, can we discontinue the IV and execute a refusal without calling OLMC?***<br>A. No, this is technically an ALS refusal and needs to be called in. The IV can be discontinued and the refusal of care should be accepted.<br>***Q: In regards to allowing someone with a valid POLST form to expire (called for a patient that doesn't want any interventions done), how long must units remain on scene after any comfort measures are applied? Are units available to leave right away, or, if death is imminent, should they remain on scene to get a time of death from OLMCD right away?***<br>A. Evaluate each case on its own merits, as there is a legal, and then there is an ethical/patient-centered answer. Legally, EMS is required to provide assessment, care, and patient disposition within their scope of practice following local protocols. Thus, if the patient's immediate needs have been satisfied and a reliable caregiver remains with the patient (to avoid an allegation of abandonment) and appropriate consent can be given for a refusal of transport, EMS should call OLMC, execute a refusal, and may leave. This is particularly appropriate if you have limited resources and need to be in service for other emergent calls.<br>From a humane perspective, if resources within your agency allow you to stay on scene until you are able to explore why the patient/caregiver called you; determine if they have any concerns, fears, or expectations as to why they would wish you to stay that are reasonably within your power to address, it would be compassionate to do so. It is not reasonable to take a crew out of service for longer than 30 minutes in these situations. Explain that you would be happy to transport them for further care or wait temporarily until their hospice worker could be called or another adult (friend, family member) could come to the scene if they just want someone else to be there. If death is imminent, staying on scene for a short time (not to exceed 30 min as that is how long we would work a cardiac arrest on scene) is a reasonable thing to do. |
| **Termination of Resuscitation** | ***Q: When responding to a cardiac arrest with no CPR being performed, who is the credible person to say if it was witnessed or not and how long the person has been down?***<br>A. EMS needs to use their best judgment to determine the most credible historian – family member, bystander, or caregiver. Each patient needs to be evaluated to determine if they need to have CPR started or not based on the presence or absence of long-term indications of death (triple zero criteria). It is generally believed that if there is any doubt as to how long they have been down in the absence of triple zero findings or a DNR order, that we should attempt resuscitation. |

| SOP section | Questions and Answers |
|---|---|
| **Drug Assisted Intubation (DAI)** | ***Q: Will drugs for DAI have the same effect on capnography waveforms as midazolam (Versed)? Curare cleft?***<br>A: Drugs, themselves, don't impact capnography. However, if ventilation is impacted by the drugs, then the $ETCO_2$ reading/waveform will change accordingly. Any sedating drug has the potential of causing ventilatory depression. Monitor $ETCO_2$ carefully on all patients receiving sedation.<br>***Q: Are we to use ketamine if Etomidate does not work? We tried ketamine and it didn't seem to work very fast.***<br>A: Etomidate remains the main drug for DAI sedation in adults unless contraindicated.<br>Ketamine is indicated as the first line sedating drug for patients with a severe asthma attack (because it causes bronchodilation) and children (because etomidate is not always approved for them).<br>If ketamine is dosed and given correctly it acts within 30 seconds but has a different effect on patients than etomidate, so paramedics may not be seeing the type or nature of sedated state that they are used to with etomidate. Neither drug provides neuromuscular blockade, so it is doubtful that ketamine would be a better agent and provide additional help if etomidate does not work.<br>***Q. If all of the lidocaine is removed, what are we going to use on the conscious patient prior to the saline flush when starting an IO?***<br>A. Lidocaine is not being removed from the Drug and Supply List, just as a premed for DAI. It is still indicated as a local anesthetic for IO infusions if the patient is conscious and/or responsive to pain. Please see drug appendix in new SOPs. |
| **Allergic reaction Anaphylaxis:** | ***Q: For all SOPs where epinephrine is indicated – is the goal to achieve a SBP of 90 or respiratory adequacy?***<br>A. The goal for all patients is cardiorespiratory stability – thus the answer is yes to both. Care should be provided to achieve a state of adequate ventilation, oxygenation, and perfusion for that person - whatever the MAP needs to be for their age, size, and situation as assessed by mental status, skin signs, vital signs, $SpO_2$ and $ETCO_2$. |
| **Asthma/COPD** | ***Q: What is the reason (science) why the 2nd dose of ipratropium is permitted?***<br>A: The initial dose, while effective, is not the highest dose permitted. We are following a dosing protocol similar to in-hospital uses. This also follows the KISS principle – just keep dosing the same for easier recall.<br>***Q: Magnesium IVPB: Are we going to be given a chart depending on tubing, drip, drip rate to calculate dose over 10 minutes?***<br>A: **It is not the System's intent that we use the premix IVPB option** on a regular basis as the traditional, more concentrated IV bolus dosing has worked well for us. The IVPB option is offered because several Systems in Region IX have switched to the premixed drips. In our System, it was accepted in case the more concentrated magnesium sulfate is on backorder and unavailable and the only formulation we can get is the premixed drips. **The dosing is deceptively simple**. If the 50 mL premix bags are put on minidrip tubing and run wide open (5 mL/min), the medication will run in over ~10 minutes. This approach has worked very well for the Delnor System.<br>***Q: Nowhere in the asthma SOP does it indicate DAI or the use of ketamine***<br>A. Many pages of the SOPs must be integrated with each other for full application and implementation including the drug appendix. Under the asthma page it says:<br>▪ **Airway/Oxygen:** Assess need for DAI if near apnea, coma or depressed mental status, exhaustion, severe hypoxia ($SpO_2$ < 90); hypercapnia ($ETCO_2$ ≥ 60 mmHg); hemodynamic instability, impending respiratory failure or arrest.<br>No individual condition page of the SOPs specifies the drugs to be given when DAI is indicated, it simply says consider need for DAI (pulmonary edema, AMS, etc..) The expectation is that members will follow the DAI protocol if the procedure is performed. The drug appendix also spells out the full profiles for etomidate and ketamine if anyone would like additional information. |
| **V-Fib / Pulseless VT** | ***Q: Can I use the ResQPOD on children?***<br>A: There are no specific age limitations in the ResQPOD's product labelling. The AHA recommends adult CPR procedures for patients reaching puberty and above. The ResQPOD may be effective in patients of all ages; however, it has only been tested clinically in adults ages 18 |

| SOP section | Questions and Answers |
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| | years and above. Animal studies in a pediatric model of cardiac arrest, have demonstrated that the ResQPOD effectively enhances circulation in 10 kg piglets in cardiac arrest. Anecdotal data suggest that the ResQPOD can be used safely in children 20 lbs (10 kg) or larger. As long as there is an adequate seal within the ventilation circuit during chest compressions, the ResQPOD should work effectively. It is the ultimate decision of the prescribing physician to determine in what ages of patients the ResQPOD should be used. Dr. O approves ResQPod in children over age 12/adolescents.<br><br>***Q: We respond to a cardiac arrest with 4 to 6 people every time. The first 2 in start CPR and place pads. That leaves 2 to 4 extra people still on scene. One could get an IO and the other could start airway. Why are we wasting time with two nasals and an oral with a NRM? I would rather see us bagging with a ResQPod and getting ready to intubate. This is more beneficial than the 2 nasals and oral and NRM. Why is this being taught?***<br>A. The most important concept in contemporary resuscitation science is rapid, sustained, and uninterrupted quality CPR creating forward blood flow and perfusion to vital organs. Adequate oxygenation without overinflating the chest or interrupting CPR is critical. Intubation practically cannot be accomplished without an interruption in CPR and frequently results in hyperventilation once accomplished (thus impairing the effectiveness of CPR). There is an abundance of data that shows this. You don't necessarily need 2 nasals and 1 oral, but BLS airways are becoming the mainstay of airway management in out of hospital cardiac arrest. At the point where ventilations are appropriate, you do need to verify adequate chest rise and a rate that does not exceed 10 BPM, but even that is not always recommended in the early resuscitation period as positive pressure ventilations reduce blood return back to the heart and reduce the effectiveness of CPR. Thus the latest research points to the value of apneic oxygenation for the first few minutes in a witnessed arrest. This is an area of great change in resuscitation science and we create all our protocols to be as evidence-based as possible. |
| **Drug OD/Poisoning**<br>Use of KETAMINE | ***Q Will ketamine have any negative effect on someone with excited delirium due to say, PCP use/overdose?***<br>A. PCP is not a contraindication to ketamine. In fact, it is a good indication to use ketamine if a patient has developed excited delirium. We would encourage all System members to read the great article published in JEMS on Nov. 1, 2016. Henderson, L. (2016). Ketamine considerations for prehospital use. JEMS, 41(11). It can be accessed on line at JEMS.com: http://www.jems.com/articles/print/volume-41/issue-11/features/ketamine-considerations-for-prehospital-use.html?cmpid=enl_JEMS_NOW_2016-11-03&email_address=cmattera@nch.org&eid=288509605&bid=1578345<br><br>Q: ***How is an IN dose of ketamine possible if a 132 lb adult should receive 2.4 mL X 2 equaling 4.8 mL and MA per nostril is 1 mL?***<br>A: In the absence of an IV, several alternate medication routes (IM and IN) may need to be used concurrently. Advantages of IN delivery:<br>• Painless; ease of use; no needles needed<br>• Nose-brain pathway allows direct delivery to the cerebral spinal fluid (great advantage with excited delirium)<br>In general, IN volumes should avoid runoff into the throat or out of the nostril. This allows more absorption and higher bioavailability. The ideal volume for one nostril is 0.25 to 0.3 mL, though we accept 1 mL per nostril, knowing that runoff and drug loss may occur at this higher volume and the patient may need re-dosing of the drug.<br>The military has done significant research on IN ketamine for pain and sedation. They allow re-dosing via the IN route **every 90 seconds** up to 5 sprays.<br>**DIVIDED DOSING OPTIONS for NWC EMSS**<br>For treatment of ***excited delirium*** in the absence of an IV (likely): the total dose needs to be **divided between 2 IM injections** (into the vastus lateralus muscle, through clothing if necessary like an autoinjector), ***and*** MULTIPLE **IN sprays. This allows division of the total drug volume into manageable amounts per route.**<br>Max drug amounts using this combination (50mg/mL drug concentration):<br>• 50 mg (1 mL) IN in each nostril (total IN dose 100 mg); may repeat X 1 in 90 sec prn *PLUS*<br>• 150 mg (3mL) IM in each leg (total IM dose 300 mg)<br>This would achieve the max dose of 500 mg for even the largest patients.<br>This approach is not practical for patients with severe asthma or children needing sedation prior to DAI. In these instances, an IV or IO needs to be placed and ketamine given by those routes. |

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| | ***Q: We have an army medic who has used ketamine extensively. He does not believe that giving ketamine without midazolam first is a good idea due to a patient who had a bad hallucination. After hearing this, our department is skeptical about solely using ketamine due to this possibly life-threatening side effect. Is this something that can be explored?***<br><br>A. Ketamine is a drug that has been around for many years and a great deal is known about it. Many high-performing EMS systems around the US and in several foreign countries are using this medication for several conditions. It is a rapidly acting drug when given by IN, IV, and IM routes. For the most part, the drug is very safe and there are minimal side effects associated with its use. In fact, the combination of safety, rapid onset, effective sedation (and pain control), and minimal side effects make it a particularly useful drug in EMS for patients with many conditions, including "excited delirium".<br><br>"Excited Delirium" is a condition associated with extreme agitation, aggressive and often violent behavior, confusion, insensitivity to pain, unexpected physical strength, and commonly hyperthermia. Law enforcement is often first on the scene and are attempting to restrain and subdue the patient. The most common cause is a stimulant drug such as cocaine, methamphetamine, PCP, MDMA, and other adrenergic-type stimulants. This condition may result in death, and is a true medical emergency requiring rapid sedation and transport to a hospital. In the past we have used midazolam in patients like this, but the onset after IM or IN administration is much longer than the onset of ketamine, and the sedation effects not as good. The longer these patients remain agitated, fight, and resist the efforts to help them, the greater the risk of sudden decompensation and death.<br><br>Ketamine can cause increased salivation, so be aware of the need for suctioning your patient after using ketamine. It does not usually cause significant respiratory depression, but on rare occasions has resulted in respiratory/depression arrest and patients need to be monitored carefully and may need assisted ventilation (including airway placement) for a brief period of time after receiving higher doses of the drug. This is especially true if other drugs have been administered such as benzodiazepines or opioids.<br><br>Another potential adverse effect is something called **emergence reactions**, where patients can have vivid hallucinations, dreams or nightmare-like experiences **as the drug wears off**. If this occurs, administering a small dose of midazolam (contact OLMC) can be helpful to treat this phenomenon.<br><br>**While some people have advocated giving midazolam before administering ketamine, this is not routinely recommended for 2 reasons**: First, studies have been done comparing midazolam plus ketamine to ketamine alone, and the emergence reactions were no less frequent. Secondly, as noted above, there is more potential respiratory depression when these drugs are combined and we would like to avoid this in our patients<br><br>For typical anxiety and agitation in our psychiatric patients, we will continue to use midazolam when pharmacologic treatment is warranted. Ketamine is reserved for those cases of extreme and violent agitation described above.<br><br>Because ketamine is also a bronchodilator and typically does not cause respiratory depression or hypotension, it is a better choice for drug-assisted intubation (DAI) in the asthmatic patient who needs to be intubated. For other patients requiring intubation, we will continue to use etomidate. |
| **Psychological emergencies** | ***Q: Some hospitals have eliminated the use of leather restraints because they cannot be cleaned and are using other devices for single patient use. Are leather restraints still approved for EMS?***<br><br>A. A thorough literature search through EMS journals and textbooks all allow for leather restraints for violent and combative patients, so we are within the national standards of care in allowing them as an option for this type of patient. Our policies also allow for soft restraints and commercial disposable options. The patients on whom full limb restraints are applied do not usually have visible blood or body secretions that would provide a cross contamination risk and I am not aware of any instances over the years when care has been called into question or compromised over their inappropriate use. If they do become soiled or contaminated, they would have to be cleaned and disinfected or thrown away and not reused. Individual hospitals may adopt policies that meet their very specific practice standards and we fully support and respect that as well. |

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| | ***Q. If ketamine is not an option for excited delirium, violent, severe agitation in patients with schizophrenia, psychosis, or bipolar mania, what is our backup option to use?***<br>A. Ketamine is used cautiously in patients with a psychotic mental illness history, therefore midazolam remains our alternate sedative. It is listed in the SOP appendix as a sedative for agitation and anxiety. Depending on the patient's history and severity at the moment, OLMC may still order ketamine if the patient's temp is very high and they are in imminent risk of dying from excited delirium. |
| **Stroke**<br>**p. 35 & 36** | ***Q: If you find1 or 2 positive findings while performing the stroke screen, can you stop, consider a stroke and start transport or packaging, or do you have to complete the prehospital stroke screen?***<br>A: You should complete the screen since the information is useful to the receiving hospital and may be the determining factors between transporting to a Comprehensive vs. a Primary Stroke Center. It doesn't (or should not) take that long (<90 sec); others can be preparing to transport while the assessment is completed. See the stroke assessment checklist at the back of the January CE independent study materials on stroke and the full neuro assessment in a stroke patient skill sheet attached to this handout. |
| **Shock**<br>**Norepinephrine** | ***Q: If norepinephrine is so potent (and possibly so dangerous), why do we not have a pump?***<br>A: Learning curve, cost, and maintenance of proficiency for a little-used drug make a pump not reasonable. All/many of our drugs are "potent" and we need to maintain the skillset of continuous/accurate administration. EMS should be able to accurately adjust a drip manually to 2 mL/min. (usual dose) The concentration of the drip and dosing was selected very carefully to enable safe and easy EMS dosing.<br>***Q: It would be very difficult to titrate a drip rate of norepinephrine IO on a pressure infuser. There is a norepinephrine dose alternative of 0.03 mg IVP with caution but it doesn't say how often this should be given.***<br>A. The IVP option is a one-time only dose. It is not repeated. However, you should be able to administer a norepinephrine drip the same as you did a dopamine drip on an IO line even if the bag is in a pressure infuser. If it cannot be titrated appropriately, transport expeditiously so the hospital can start a peripheral IV line for ongoing drug therapy.<br>***Q: Why don't you just give us labels to put on the norepinephrine bags?***<br>A. Great idea! They've been created and will be distributed with the January CE classes. |
| **Spine trauma** | ***Q: The SOP states that patients in car crashes with no injuries must be collared and allowed to self-extricate. If SSMR conditions are not met, are collars necessary for all MVA patients as the SOP implies?***<br>A. The SOPs do not say *must.* Collars are only used if EMS determines that spine precautions are indicated based on patient reliability and physical exam findings. If there is no injury suspected or likely by exam in a reliable patient, no spine precautions are needed, including no c-collar. |
| **Peds Airway Adjuncts** | ***Q: Peds DAI, why premedicate with fentanyl for pain if ketamine also has these properties? Is this too much?***<br>A: That is a good point! Most RSI/DAI protocols include a provision for providing appropriate analgesia prior to sedation if needed. Fentanyl is routinely included, as many sedatives do not have any analgesic properties. When we made the transition to re-allowing DAI in children and determined that ketamine was a better sedating agent than midazolam, the premedication with fentanyl could have been eliminated. Most children needing urgent airway management are due to medical causes, so from a practical standpoint, prior pain management is not usually a consideration. However, if intubating a child with severe trauma, going straight to ketamine and omitting the fentanyl is very reasonable. Call OLMC control to confirm that medication approach and we will remove fentanyl from this page for future editions of the protocol. |

General

***Q: What happens if the IN devices cannot be replaced (due to the nationwide recall)?***

A: The System issued System Memo #362 and Clinical Practice Alert **MAD Supplemental Instructions for continued use of Recalled Lots** on December 15, 2016 (memo is posted to the System website: www.nwcemss.org . The good news is that we have alternative routes for every drug that is currently given via a MAD device, so no patient should receive care inconsistent with our standards. See below.

Date: December 15, 2016 **System Memo: # 362**

To: All Chiefs; Provider EMSCs, Hospital EMSCs/Educators; Paramedics & EMTs; ECRNs

From: Connie J. Mattera, M.S., R.N., EMT-P
EMS Administrative Director

RE: **MAD Supplemental Instructions for continued use of Recalled Lots**

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The Teleflex company has issued Supplemental Instructions for Continued Use of Recalled Lots of the MAD Devices. A copy of the full recall notice is attached to this System Memo.

Dr. Ortinau believes these steps to be reasonable when there is time to check the device (pain management). If a patient is in urgent need of a drug (active seizures), an alternative drug delivery route (IM, IV) will likely need to be considered.

Please pass this information to all EMS personnel (EMTs, paramedics, and ECRNs).
It may have the most urgent use if IN naloxone is needed.

**To continue the use of products affected by this recall please follow the below pre-test procedure.** This pre-test is not required for lots not affected by this recall.

**Ensuring Appropriate Device Output:**

Prior to use, please test the device as follows:

- Attach a syringe containing 1mL of either sterile water or sterile saline to the device. (May use preloaded syringes of NS for IV flush)
- Briskly compress the plunger on the syringe so as to deliver the liquid through the device and observe how the liquid comes out at the [distal] end.
- If the liquid sprays in a fine mist then the device is atomizing as intended and may be used.
- If testing the device demonstrates streaming, select another MAD device for testing and use.

Note: These supplemental instructions are being provided to ensure adequate supply of these products due to medical necessity. If you chose not to use the affected products, please follow the return procedures included in the original recall notice.

The U.S. Food and Drug Administration has approved the distribution of the affected stock with the Supplemental Instructions. Please contact Teleflex Customer Service at 1-866-246-6990 or e-mail recalls@teleflex.co, with questions or to process returns.