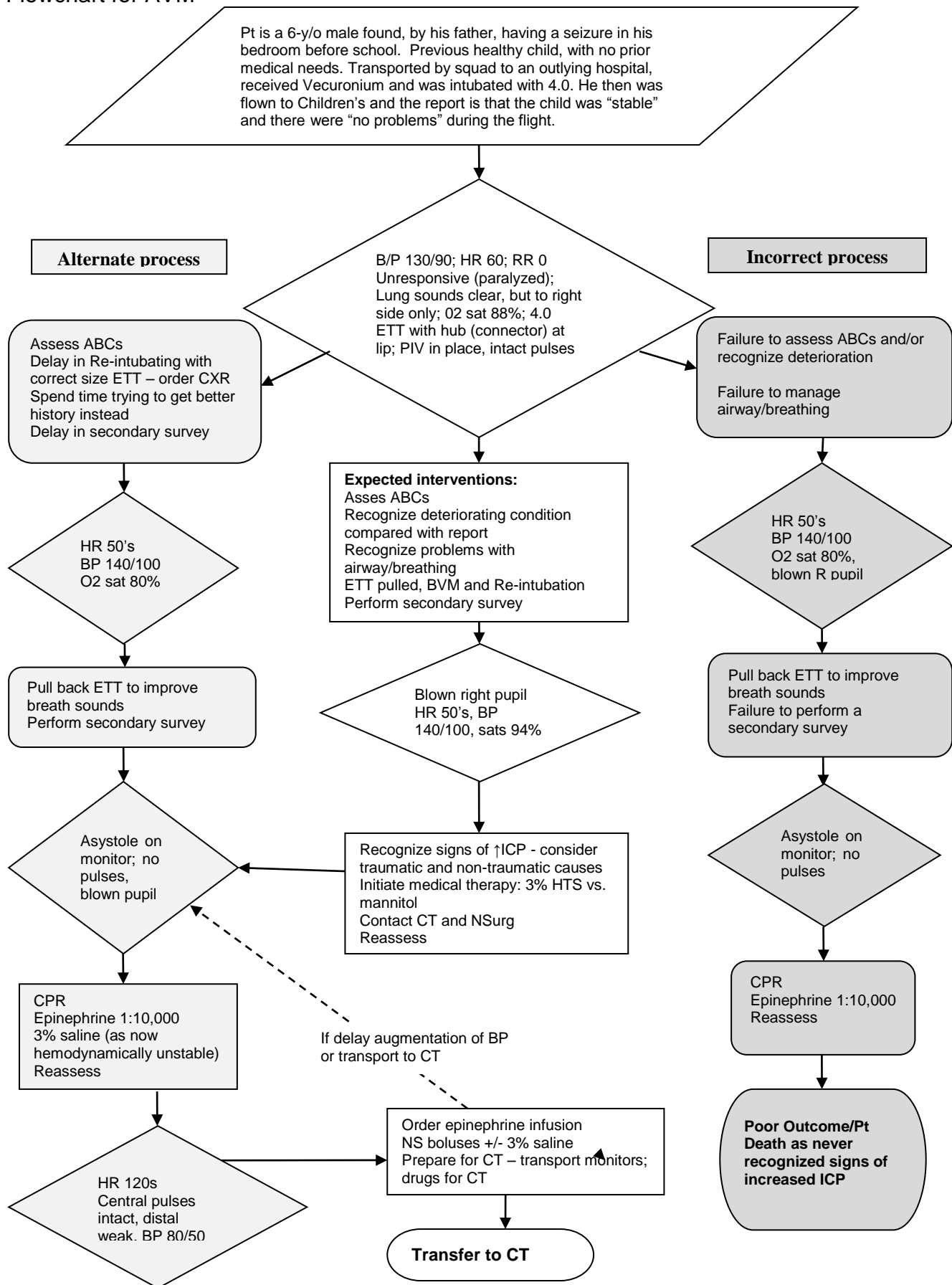


<p>Goals and objectives Technical and non-technical</p> <p>Case: Spontaneous rupture cerebral AVM and right mainstem intubation at outside hospital</p>	<ol style="list-style-type: none"> 1. Recognition of airway problem: intubated patient who is presenting with hypoxia <ol style="list-style-type: none"> a. What is differential diagnosis (i.e. DOPE)? b. What are initial management techniques? 2. Differential diagnosis of new-onset seizures and/or altered mental status 3. Recognition of possible increased intracranial pressure <ol style="list-style-type: none"> a. What are the clinical signs? b. What are the initial management techniques? c. Does recognition of increased ICP change your differential diagnosis for new-onset seizures? 4. Non-technical: <ol style="list-style-type: none"> a. Establishment of team leader b. Establishment of shared mental model/situation awareness c. Closed loop communication d. Use of assertive statements e. Identification of latent threats
<p>Target participants (roles, specialty)</p>	<p>Emergency Department (ED) Providers</p>
<p>Clinical setting (ED, OR, patient room) sim lab or insitu</p>	<p>ED: In situ, Sim Lab</p>
<p>Basic scenario information (outline)</p>	<p>Brought to resuscitation bay as “Medical Team” by aeromedical transport from outside hospital already intubated and billed as new-onset seizures and “stable” in transport</p> <p>Scenario Background: <i>Past Medical History:</i> None <i>Drug Allergies:</i> None <i>Medications:</i> None reported <i>Chief Complaints:</i> seizure</p> <p>Your patient is a 6-year old male, who was found, by his father, having a seizure in his bedroom before school. Previously healthy child with no prior medical needs. He was transported by squad to an outlying hospital, received Vecuronium and was intubated with 4.0 uncuffed ETT. He then was flown to Children’s and the report is that the child was “stable” and there were “no problems” during the flight.</p> <p><u>Initial exam:</u> B/P 130/90; HR 60; RR 0; sats 88% 4.0 ETT with hub (connector) at lip (the ETT tip is currently in the right main stem) Lung sounds clear on right side, no breath sounds on the left PIV in place, intact pulses Unresponsive</p> <p><u>Case progression:</u> Move to recovery if correct treatment is provided, although will develop asystole despite appropriate initial care <u>Worse</u> if appropriate care is not provided, there is a delay in care (if over 4 minutes without expected interventions) or if incorrect intervention(s) performed Signs of deterioration: decreased HR, increasing BP, decreased distal pulses, declining saturations If patient arrests, then go to pulseless asystole requiring CPR, epinephrine bolus(s) and medical intervention to reduce ICP</p>
<p>Simulator to be used</p>	<p>Child (Meti or Gaumard)</p>
<p>Fluids and medications</p>	<p>As in the ED setting, will have access to all the medications available in the Pyxis, as well as ability to order medications from Pharmacy (i.e. antibiotics) IVF: NS or LR Hyperosmolar therapy: mannitol and/or 3%NS Epinephrine 1:10,000 Epinephrine (or other inotrope) infusion to raise MAP (to sustain CPP)</p>
<p>Equipment needed (IV’s, ET tubes, Chest tubes,)</p>	<p>General: Personal protective equipment (gloves, gowns, etc) Monitor and associated equipment (BP cuff, pulse oximetry cable, etc.) Warming blankets/Bear Hugger Defibrillator</p>

	<p>Backboard IVF pump, syringe pumps x 2, Rapid Infuser, Hotline</p> <p>IV Supplies: Angiocaths, tubing, syringes, tape and IV practice arm</p> <p>Airway Supplies: BVM, oxygen source Laryngoscope blades, ET Tubes, stylets, Tape</p>
Paperwork, labs, X rays and EKG's, photos, videos	<p>Lab Values: I-stat pH 7.10, pCO2 54, BD -7, gluc 105, Na 137, K 4.5, iCa 1.1</p> <p>X-Rays: Chest (tube placement) available, Left Lung collapse (one with ETT in right main stem and one with ETT in trachea if ETT pulled back or re-intubated)</p> <p>Head CT: diffuse intracranial bleed due to non-operable ruptured AVM</p>
Medication intervention	<p>Must initiate hyperosmolar therapy: mannitol 0.5-1 g/kg, 3% HTS at 3-8ml/kg</p> <p>Anticipate need for adrenergic support (epinephrine infusion 0.1-1mcg/kg/min, 0.05-0.1 mcg/kg/min for Norepinephrine)</p> <p>Anticonvulsants: phosphenytoin 20 mg/kg loading infusion, as prophylaxis</p>
Airway intervention (oxygen, BVM, intubation)	<p>Identify displaced/misplaced ETT: patient has right main stem intubation that has been prolonged leading to left lung collapse and hypoxia; should pull tube back until patient improves/equal breath sounds</p> <p>Correct Pre-Existing Incorrect ETT Size: patient has significant air leak - given age, a 5.0 cuffed or 5.5 uncuffed ETT is indicated; tube should be exchanged</p>
Physiologic intervention (CPR)	<p>Fluid resuscitation for maintenance of CPP and decrease of ICP</p> <p>CPR</p> <p>Assisted Ventilation and Oxygenation</p>
Procedures and other interventions	<p>Re-Intubation</p> <p>IO or central venous access in order to safely deliver inotropes</p> <p>Arterial line appropriate if delay to ICU bed or high rate of pressors required</p>
Number of and education of instructors	<p>1 facilitator</p> <p>1-2 simulation specialist</p> <p>1 AV specialist</p>
Evaluation tools and measurement points	<p>Standard Debriefing Checklist</p>
Advance organizer/pretest and how delivered	<p>Not applicable</p>
Personnel-simulation specialist, Actors/family members	<p>Consider actor as non-significant figure as no parents will be available (came by aircare)</p>
Estimated time to run simulation and debriefing	<p>Simulation 10 minutes</p> <p>Debriefing 10 minutes</p>
Need for reevaluation (time frame)	<p>Not applicable</p>

Flowchart for AVM



Process may transition from one line to another (incorrect to desirable or vice versa), especially if team performs incorrect actions – i.e. intubation is esophageal or right main stem, incorrectly performs CPR, incorrect selection of medications, etc. It is not possible to depict/guess all expected team actions on this flowchart.

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