

## Trauma Pharmacology Cheat sheet

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Primary Survey		
	<u>Assessment</u>	<u>Pharmacologic Management</u>
<b>Airway</b>	<ul style="list-style-type: none"> <li>● Position/patency</li> <li>● Need for protection</li> <li>● Obstruction of airway with foreign object/blood</li> </ul>	<p><b>Intubation meds</b></p> <ul style="list-style-type: none"> <li>● Etomidate 0.3 mg/kg</li> <li>● Ketamine 1-2 mg/kg                             <ul style="list-style-type: none"> <li>○ (caution in TBI)</li> </ul> </li> <li>● Propofol 1-2 mg/kg                             <ul style="list-style-type: none"> <li>○ (caution in hypoTN)</li> </ul> </li> <li>● Succinylcholine 1.5 mg/kg                             <ul style="list-style-type: none"> <li>○ (caution ↑ K+)</li> </ul> </li> <li>● Rocuronium 1 mg/kg (range 0.6 - 1.2 mg/kg)                             <ul style="list-style-type: none"> <li>○ Duration 45-90 mins</li> <li>○ Have Post-intubation sedation plan prior to RSI</li> </ul> </li> <li>● Post-Intubation Analgesia &amp; Sedation                             <ul style="list-style-type: none"> <li>○ Fentanyl 25-100 mcg q 5-30 min PRN</li> <li>○ Hydromorphone 0.2-1 mg q2h PRN</li> <li>○ Propofol infusion starting rate 5-50 mcg/kg/min</li> </ul> </li> </ul> <p><b>Chest Tube Insertion</b></p> <ul style="list-style-type: none"> <li>● Lidocaine 1-2% 5-10 mL</li> <li>● Ketamine 0.3 mg/kg IV (pain dose, sub-dissociative)</li> <li>● Fentanyl 0.5-1 mcg/kg</li> <li>● Midazolam 0.5-2 mg</li> </ul>
<b>Breathing</b>	<ul style="list-style-type: none"> <li>● Apnea/poor effort</li> <li>● Signs of pneumothorax</li> <li>● ? bilateral breath sounds</li> </ul>	
<b>Circulation</b>	<ul style="list-style-type: none"> <li>● HR, BP</li> <li>● Pulses,</li> <li>● ? Diaphoretic</li> <li>● Cold extremities</li> <li>● Source of bleeding</li> <li>● eFAST (US)</li> <li>● TEG/ROTEM</li> <li>● Anticoagulation therapy</li> <li>● Last dose of anticoagulation therapy</li> </ul>	<p><b>Shock</b></p> <ul style="list-style-type: none"> <li>● Blood product</li> <li>● Warm IV fluids &lt;1-2 L unless told by otherwise</li> <li>● Tranexamic acid (TXA) 1g in 50 mL 0.9% NaCL x 1 over 10 min followed by 1 g over 8 hours                             <ul style="list-style-type: none"> <li>○ 2<sup>nd</sup> bag should come from inpatient pharmacy</li> </ul> </li> </ul> <p><b>Massive Transfusion Protocol</b></p> <ul style="list-style-type: none"> <li>● For every 2 – 4 units of blood product give:                             <ul style="list-style-type: none"> <li>● Calcium gluconate 2-3 g OR</li> <li>● Calcium chloride 1-3 g</li> </ul> </li> </ul>

		<p>Anticoagulation Reversal</p> <ul style="list-style-type: none"> <li>● Vitamin K antagonist/warfarin <ul style="list-style-type: none"> <li>○ Vitamin K 10 mg IV</li> <li>○ Prothrombin Complex Concentrate <ul style="list-style-type: none"> <li>▪ Fixed dose <ul style="list-style-type: none"> <li>● 1000 units for non-ICH bleed</li> <li>● 1500 for ICH bleed</li> <li>● an additional 500 units for INR &gt; 7 or &gt; 100 kg; also if goal INR not achieved after initial dose</li> </ul> </li> </ul> </li> </ul> </li> <li>● Factor Xa Inhibitors <ul style="list-style-type: none"> <li>○ Prothrombin Complex Concentrate (25-50 units/kg)</li> </ul> </li> </ul>
<p><b>Disability</b></p>	<p><b><u>Glascow Coma Scale (GCS)</u></b></p> <ul style="list-style-type: none"> <li>● &lt;8? ☹️RSI</li> </ul> <p><b><u>Severe Head Injury</u></b></p> <ul style="list-style-type: none"> <li>● GCS &lt;8</li> <li>● Responds only to pain or unresponsive</li> </ul> <p><b><u>Impending herniation/ ICP</u></b></p> <ul style="list-style-type: none"> <li>● Unilateral fixed and dilated pupils</li> <li>● Cushing triad <ul style="list-style-type: none"> <li>○ ↑ BP</li> <li>○ ↓ HR</li> <li>○ Irregular respirations</li> </ul> </li> </ul> <p><b><u>Neurogenic Shock</u></b></p> <ul style="list-style-type: none"> <li>● ↓ HR, ↓ BP</li> <li>● Abnormal tone</li> </ul> <p><b><u>Carbon Monoxide Poisoning</u></b></p> <ul style="list-style-type: none"> <li>● HX of burning of any fuel with inadequate oxygen, Suicide attempt using automobile exhaust, Burn victims with</li> </ul>	<p>RSI * See in Airway section</p> <p><b><u>Impending herniation/ICP Reduction</u></b></p> <ul style="list-style-type: none"> <li>● Hypertonic Saline <ul style="list-style-type: none"> <li>○ 3% 3-5 mL/kg <ul style="list-style-type: none"> <li>▪ ~250-500 mL</li> <li>▪ Peripheral access allowed</li> </ul> </li> <li>○ 23.4 % <ul style="list-style-type: none"> <li>▪ 30-45 mL</li> <li>▪ need central access</li> </ul> </li> </ul> </li> <li>● Mannitol <ul style="list-style-type: none"> <li>○ 0.5-1 gram/kg <ul style="list-style-type: none"> <li>▪ Check for crystallization</li> <li>▪ Require in-line 0.22-micron filter</li> <li>▪ Avoid in hypotension</li> </ul> </li> </ul> </li> </ul> <p><b><u>Burn Activations</u></b></p> <ul style="list-style-type: none"> <li>● CO poisoning <ul style="list-style-type: none"> <li>○ Oxygen <ul style="list-style-type: none"> <li>▪ 100% FIO2</li> <li>▪ Intubation</li> </ul> </li> <li>○ Deep sedation for ventilator synchrony</li> </ul> </li> </ul> <p><b><u>Cyanide Poisoning</u></b></p> <ul style="list-style-type: none"> <li>● Decontamination</li> <li>● ABCs</li> </ul>

	<p>smoke inhalation.</p> <ul style="list-style-type: none"> <li>● Altered mental status</li> <li>● O2 saturations not accurate</li> <li>● Blood gas</li> <li>● Carboxyhemoglobin</li> </ul> <p><b><u>Cyanide Poisoning</u></b></p> <ul style="list-style-type: none"> <li>● Hx of smoke inhalation, fires burning plastics, wools, silk and other natural and synthetic polymers, long infusion of Sodium nitroprusside, fumigant in airplanes, buildings, ships.</li> <li>● Rapid loss of consciousness</li> <li>● Altered mental status</li> <li>● Lactate &gt; 8 mmol/L is 94% sensitive for cyanide toxicity</li> </ul>	<ul style="list-style-type: none"> <li>● Indications for Antidote <ul style="list-style-type: none"> <li>○ altered mental status, seizures, hypotension or metabolic acidosis with high suspicion of cyanide exposure</li> </ul> </li> <li>● Cyanokit (hydroxocobalamin) <ul style="list-style-type: none"> <li>○ 5g (70 mg/kg for peds) hydroxocobalamin diluted in 200 mL of NS IV over 15 minutes. Hang to gravity, does not connect to Smartpump.</li> <li>○ Preparation instructions in the box</li> <li>○ It also turns urine and secretions red, which can interfere with labs and dialysis</li> <li>○ May not be available and alternative is sodium nitrite and sodium thiosulfate (Nithiodote kit)</li> </ul> </li> </ul>
<p><b>Exposure &amp; Environment</b></p>	<p>Medical team should examine all body parts</p> <p>Open Fractures</p> <ul style="list-style-type: none"> <li>● Which Grade of open Fracture</li> <li>● Type I Fracture <ul style="list-style-type: none"> <li>○ An open fracture with a wound less than 1 cm long and clean</li> </ul> </li> <li>● Type II Fracture <ul style="list-style-type: none"> <li>○ An open fracture with a laceration greater than 1 cm long without extensive soft tissue damage</li> </ul> </li> <li>● Type III Fracture <ul style="list-style-type: none"> <li>○ IIIa: High energy fracture, &gt; 10 cm in size with extensive soft tissue damage, contamination, severe comminution, and adequate soft tissue coverage</li> <li>○ IIIb: criteria above plus</li> </ul> </li> </ul>	<p><b><u>Open Fracture Antibiotics</u></b></p> <ul style="list-style-type: none"> <li>● Grade 1+2 <ul style="list-style-type: none"> <li>○ Cefazolin 2 g (3 g if &gt; 120 kg) IV q8h <ul style="list-style-type: none"> <li>▪ Reconstitute with 5-10 ml of SWFI/NS per 1g</li> </ul> </li> <li>○ Alt: vancomycin or clindamycin 900 mg IV q8h <ul style="list-style-type: none"> <li>▪ Duration 24 hours</li> </ul> </li> </ul> </li> <li>● Grade 3 <ul style="list-style-type: none"> <li>○ Ceftriaxone 2 g q24h IV <ul style="list-style-type: none"> <li>▪ Reconstitute with 10 ml of SWFI/NS per 1g</li> </ul> </li> <li>○ Alt: vancomycin or clindamycin 900 mg IV q8h AND gentamicin 5 mg/kg IV q24h</li> <li>○ Alt 2: Clindamycin 900 mg IV q8h + levofloxacin 500 mg IV q24h</li> </ul> </li> <li>● Soil or fecal material <ul style="list-style-type: none"> <li>○ Add to above: Penicillin G 4 million units IV q4h</li> <li>○ Alt: Ceftriaxone 2g q24h IV+ Metronidazole 500 mg IV q8h</li> </ul> </li> </ul>

	<p>requires free tissue flap or rotational flap coverage</p> <ul style="list-style-type: none"> <li>○ IIIc: criteria above plus major vascular injury requiring repair</li> </ul> <p>Pain Score</p> <ul style="list-style-type: none"> <li>● Scale 1-10</li> </ul> <p><b>Tetanus status (5-10 years since last dose?)</b></p>	<ul style="list-style-type: none"> <li>● Salt water contamination (Vibrio spp.) <ul style="list-style-type: none"> <li>○ Add to above: Doxycycline 100 mg q12h</li> </ul> </li> <li>● Freshwater contamination (to replace above abx) <ul style="list-style-type: none"> <li>○ Piperacillin/tazobactam 4.5 g IV q8h</li> <li>○ Alt: Levofloxacin 500 mg IV q24h + metronidazole 500 mg IV q8h</li> </ul> </li> </ul> <p>Tetanus Prophylaxis</p> <ul style="list-style-type: none"> <li>○ TD/TDAP if &gt; 5 years for dirty wound or &gt;10 years for clean wound</li> </ul> <p>Analgesia</p> <ul style="list-style-type: none"> <li>● Fentanyl 0.5-2 mcg/kg <ul style="list-style-type: none"> <li>○ Tradition 50 mcg</li> </ul> </li> </ul>
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<p><b>Tips and Comment</b></p>	<ul style="list-style-type: none"> <li>● Stay calm and focus on the algorithm</li> <li>● Know when the right time to make a recommendation</li> <li>● Anticipate pharmacotherapy needs 5-10 minutes ahead</li> <li>● Be sure to look for open fractures (even small ones)</li> <li>● Closed Loop Communication is best</li> </ul> <p><b><u>Things to focus on:</u></b></p> <ul style="list-style-type: none"> <li>● Analgesia</li> <li>● RSI meds</li> <li>● Post-intubation sedation</li> <li>● Anticoagulation reversal</li> <li>● Open fractures</li> <li>● Tetanus Prophylaxis</li> </ul>
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