## Operating Room Crisis Checklists

The use of this manual is meant as a guideline and reference. It is not meant to be a substitute for training and experience.

Color code:
- Blue – Respiratory
- Red – Cardiac
- Green - Other
- Yellow - Reference

### 1. Failed Airway
### 2. Hypoxia
### 3. Bronchospasm
### 4. Pneumothorax
### 5. Hemorrhage
### 6. Hypotension
### 7. Tachycardia – Unstable
### 8. Bradycardia – Unstable
### 9. Cardiac Arrest – Asystole/PEA
### 10. Cardiac Arrest – VF/VT
### 11. Myocardial Ischemia
### 12. Malignant Hyperthermia
### 13. Air Embolism – Venous
### 14. Transfusion Reactions
### 15. Local Anesthetic Toxicity
### 16. Anaphylaxis
### 17. Fire
### 18. Total Spinal Anesthesia
### 19. Appendices - References

---

Operating Room
Crisis Checklists

>> Do not remove book from this room <<

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### 19. Appendices - References
1 Failed Airway

Two unsuccessful intubation attempts by airway expert

1. Call “Anesthesia STAT” and ask for an airway cart
   • Ask: “Who will be the Event manager?”
2. Get Difficult Airway cart and Video Laryngoscope
3. Bag mask ventilate with FiO2 100%
4. Is ventilation adequate?
5. Consider “Code Surgical Airway” early. (Page ACS)

Call “Code Surgical Airway”
X43000 West Campus
X72411 East Campus
## Failed Airway

Two unsuccessful intubation attempts by airway expert

### Ventilation

#### NOT ADEQUATE
- Optimize Ventilation
  - Reposition patient
  - Oral /nasal airway
  - Two-handed mask
- Check Equipment
  - FiO2 = 100%
  - Capnography
  - Circuit integrity
- Check Ventilation

#### Switch list if ventilation status changes

#### ADEQUATE
- Consider awakening patient or alternative approaches to secure airway...
  - Advanced Airway by Trained Staff Member
  - Abort Case

---

Remains NOT ADEQUATE

- Place i-gel supraglottic airway
- If unsuccessful, attempt intubation using video laryngoscope
- Prepare for surgical airway (prep neck, get cricothyroidotomy / tracheostomy kit, call for surgeon)
- Re-check ventilation

---

Still NOT ADEQUATE

- Implement surgical airway

---

Call “Code Surgical Airway”
X43000 West Campus
X72411 East Campus
Hypoxia

Unexplained Oxygen Desaturation

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Turn FiO2 to 100% at high gas flows
   • Confirm inspired FiO2 = 100% on gas analyzer
   • Confirm presence of end-tidal CO2 and changes in capnogram morphology
3. Hand ventilate to assess compliance
   • Be aware of patients with ARDS/Respiratory failure
4. Listen to breath sounds
5. Check
   • Blood pressure, PIP, pulse
   • ET tube position
   • Pulse oximeter placement
   • Circuit integrity: look for disconnection, kinks, holes
6. Consider actions to assess possible breathing issues
   • Draw blood gas
   • Suction (to clear secretions, mucus plug)
   • Remove circuit and use ambu-bag (self-inflating)
   • Bronchoscopy
   • Consider Respiratory Therapy Consult (RH Failure – May require Nitric oxide /Pharmacy consult)
   • Consider Milrinone / espoprostenol (Vieltri)
7. Consider Causes
   • Is Airway/Breathing issue suspected?
2 Hypoxia

Unexplained Oxygen Desaturation

No Airway issue suspected

Circulation
- Embolism
  - Pulmonary embolus
  - Air-embolism TAB 13
- Heart Disease
  - Congestive heart failure
  - Coronary heart disease
  - Myocardial ischemia TAB 11
  - Cardiac tamponade
  - Congenital / anatomical defect
- Sever sepsis
- If hypocalcemia associated with hypotension go to TAB 6

Drugs / Allergy
- Recent drugs given
- Dose error / allergy / anaphylaxis
- Dyes and abnormal hemoglobin (e.g., methemoglobin, methylene blue)

YES! Airway issue is suspected

Airway / Breathing
- Aspiration
- Atelectasis
- Bronchospasm – Go to TAB 3
- Hypoventilation
- Laryngospasm
- Obesity / positioning
- Pneumothorax – Go to TAB 4
- Pulmonary edema
- Right mainstem intubation
- Ventilator setting, leading to auto-peep

Additional DIAGNOSTIC TESTS
- Fiberoptic bronchoscope
- Chest x-ray
- Lung Ultrasound

Reconsider Your Diagnosis

EMERGENCY MANUAL

Version 1.0
March 31, 2020
3 Bronchospasm

*Increased PIP, wheezing, increased expiratory Time, increased EtCO2, upsloping capnography tracing*

**START**

1. Call “Anesthesia STAT” and consider a code cart
   - Ask: “Who will be the Event Manager?”
2. Increase FiO2 to 100%
3. Change I:E ratio to allow for adequate exhalation
   - Bronchospastic patients who develop sudden hypotension may be air-trapping. Consider temporary circuit disconnect
4. Deepen anesthetic (Sevoflurane or Propofol)
5. Rule out problems with ETT (Mucous plug, mainstem intubation)
6. Give Beta 2 Agonists via ETT
7. If severe give epinephrine (10 – 100 mcg IV - may repeat)
   - Or Give Epi-Pen (Omnicell)
8. Rule out anaphylaxis: Go to TAB 16
9. Consider ECMO if available: (Page “9-ECMO”)

**SUPPLEMENTAL Medications**

- Beta-2 agonist (albuterol)
- Epinephrine: 10 mcg IV and escalate
- Ketamine: 0.2 – 1.0 mg/kg IV
- Hydrocortisone: 100 mg IV
- Nebulized racemic epinephrine

**Reconsider Your Diagnosis**
4 Pneumothorax

Increased peak inspiratory pressures, tachycardia, hypotension, hypoxemia, Decreased or asymmetric breath sounds, hyper-resonance of chest to percussion, tracheal deviation (Late sign), increased JVD / CVP, have high index of suspicion for pneumothorax in trauma patients and COPD patients

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Increase FiO2 to 100%
3. Rule out mainstem intubation
4. Consider Ultrasound or STAT CXR
5. Do not delay Treatment if Hemodynamically Unstable
6. Call for Immediate Chest tube / Thoracostomy
   1. Call ACS (West X4300, East X72411)

Reconsider Your Diagnosis
5 Hemorrhage

Acute massive bleeding

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Open IV Fluids and assess adequate IV Access
3. Turn FiO2 to 100% and turn down volatile anesthetics
4. Call Blood Bank
   • Activate massive transfusion protocol
   • Consider Emergency Release for Blood/Product
   • Assign 1 person as primary contact for blood bank
   • Order and give blood products (in 2:1:1 ratio of PRBC/:FFP/PLT)
5. Call for Belmont or Level 1 Infuser
6. Discuss management plan between anesthesia, surgery and nursing teams
7. Replace products early
8. Keep patient warm
9. Send Labs
   • CBC, PT/PTT, INR, Fibrinogen, Lactate, Arterial blood gas, ionized calcium, potassium, Type and Cross

Consider
• Placing Arterial Line
• Electrolyte disturbances (hypocalcemia and hyperkalemia)
• Damage control surgery (pack, close, resuscitate)
• Reversal of anticoagulation (Tab A1 and A2)
• Page Perfusionist to set up Cell Saver
5 Hemorrhage

Acute massive bleeding

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HYPOCALCEMIA Treatment</strong></td>
</tr>
<tr>
<td><strong>Prevention:</strong> Give 500 – 1000 mg Ca Gluconate per unit of PRBC or FFP</td>
</tr>
<tr>
<td>Give calcium to replace deficit (calcium chloride or calcium gluconate)</td>
</tr>
<tr>
<td><strong>Calcium gluconate:</strong> 30 mg/kg IV</td>
</tr>
<tr>
<td><strong>Calcium chloride:</strong> 10 mg/kg IV</td>
</tr>
<tr>
<td><strong>HYPERKALEMIA Treatment</strong></td>
</tr>
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<td><strong>Calcium gluconate:</strong> 30 mg/kg IV</td>
</tr>
<tr>
<td><strong>Calcium chloride:</strong> 10 mg/kg IV</td>
</tr>
<tr>
<td><strong>Insulin:</strong> 10 units regular IV with 1 – 2 amps D5W as needed</td>
</tr>
<tr>
<td><strong>Sodium bicarbonate if pH &lt;7.2:</strong> 1 – 2 mEq/kg slow IV PUSH</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECIAL Patient Populations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRAUMA</strong></td>
</tr>
<tr>
<td>Tranexamic Acid</td>
</tr>
<tr>
<td>1000 mg IV over 10 min, followed by 100 mg over the next 8 hours.</td>
</tr>
<tr>
<td>Avoid acidosis, hypothermia and coagulopathy</td>
</tr>
<tr>
<td><strong>NON-SURGICAL UNCONTROLLED BLEEDING</strong></td>
</tr>
<tr>
<td>Despite massive transfusion of FFP, PRBC, Platelets and Cryo.</td>
</tr>
<tr>
<td>• Consider giving Recombinant Factor VIIa: 40 mcg/kg IV</td>
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</tbody>
</table>
6 Hypotension

Unexplained drop in blood pressure refractory to initial treatment

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Check....
   • Pulse
   • Blood pressure
   • Equipment
   • Heart Rate
     • Bradycardia: Go to TAB 8
     • Rhythm
       • If VF/VT go to TAB 10
       • If Asystole/PEA go to TAB 9
3. Run IV fluids wide open
4. Give vasopressors and titrate to response
   • MILD: ephedrine or phenylephrine
   • SIGNIFICANT/REFRACTORY: epinephrine bolus, consider infusion
5. Turn FiO₂ to 100% and turn down volatile anesthetics
6. Inspect surgical site for bleeding
   • (If bleeding go to TAB 5)
7. Consider Actions
   • Place patient in Trendelenburg position
   • Obtain additional IV access
   • Place arterial line, check electrolytes
   • TEE?
8. Consider Causes
   - Operative Field
     • Mechanical or surgical manipulation
     • Insufflation during laparoscopy
     • Retraction
     • Vagal stimulation
     • Vascular compression
   - Unaccounted Blood Loss
     • Blood in suction canister, Bloody sponges, Blood on the floor, Internal bleeding
   - Drugs/Allergy
     • Anaphylaxis go to TAB 16
     • Recent drugs given
     • Dose error
     • Drugs used on the field
     • Wrong drug
   - Breathing
     • Increased PEEP
     • Hypoventilation
     • Hypoxia go to TAB 2
     • Persistent hyperventilation
     • Pneumothorax go to TAB 4
     • Pulmonary edema
   - Circulation
     • Air embolism go to TAB 13
     • Bradycardia go to TAB 8
     • Tachycardia go to TAB 7
     • Bone cementing (methylmethacrylate effect)
     • Myocardial ischemia go to TAB 11
     • Emboli (pulmonary, fat, septic, amniotic CO₂)
     • Severe sepsis
     • Tamponade
     • Electrolytes
     • Endocrine
6 Hypotension

Unexplained drop in blood pressure refractory to initial treatment

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
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<tbody>
<tr>
<td>Ephedrine:</td>
<td>5 – 25 mg IV, repeat as needed</td>
</tr>
<tr>
<td>Phenylephrine:</td>
<td>80 – 200 mcg IV, repeat as needed</td>
</tr>
<tr>
<td>Epinephrine:</td>
<td>BOLUS: 4 – 8 mcg IV</td>
</tr>
<tr>
<td></td>
<td><em>(dilute 1 mg in 10 mL (100 mcg/mL), then 1 cc in 10cc NS (10 mcg/mL)</em></td>
</tr>
<tr>
<td></td>
<td>INFUSION: 0.1 – 1 mcg/kg/min</td>
</tr>
<tr>
<td>Calcium:</td>
<td>1 gram bolus Calcium Gluconate or Carbonate</td>
</tr>
<tr>
<td>Vasopressin:</td>
<td>1 – 2 Unit Bolus</td>
</tr>
<tr>
<td></td>
<td>Infusion: 1 – 4 U/Hr.</td>
</tr>
<tr>
<td>Norepinephrine:</td>
<td>Infusion: 8 – 30 mcg/min</td>
</tr>
<tr>
<td>Hydrocortisone:</td>
<td>100 mg IV</td>
</tr>
</tbody>
</table>

Reconsider Your Diagnosis
7 Tachycardia - Unstable

Persistent tachycardia with hypotension, ischemic chest pain, altered mental status or shock

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Turn FiO2 to 100% and turn down volatile anesthetics
3. Analyze rhythm
   • If wide complex, irregular: treat as VF/VT, go to TAB 10
   • Otherwise: prepare for cardioversion
4. Prepare for immediate synchronized cardioversion
   • Sedate all conscious patients unless deteriorating rapidly
   • Turn monitor / defibrillator ON, set to defibrillator mode
   • Place electrodes on chest
   • Engage synchronization mode
   • Look for mark/spike on the R-wave indicating synchronization mode
   • Adjust in necessary until SYNC markers seen with each R-wave
5. Synchronized Cardioversion at appropriate energy level
   • Select energy level - use Table at right
   • Press charge button
   • Press and hold shock button
   • Check monitor; if tachycardia persists, increase energy level
   • Engage synchronization mode after delivery of each shock
6. Consider expert consultation

Narrow complex tachycardia

Wide complex tachycardia

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March 31, 2020
Persistent tachycardia with hypotension, ischemic chest pain, altered mental status or shock

**SYNCHRONIZED CARDIOVERSION energy levels**

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>ENERGY LEVEL (progression in Joules)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow complex, regular</td>
<td>50 – 100 – 150 - 200</td>
</tr>
<tr>
<td>Narrow complex, irregular</td>
<td>120 - 150 - 200</td>
</tr>
<tr>
<td>Wide Complex, regular</td>
<td>100 - 150 - 200</td>
</tr>
<tr>
<td>Wide complex, irregular</td>
<td>Treats as VF/VT: go to <strong>TAB 5</strong></td>
</tr>
</tbody>
</table>

**SYNCHRONIZATION UNSUCCESSFUL**

If cardioversion needed and impossible to synchronize shock, use high-energy unsynchronized shocks

**Defibrillation doses**

Follow manufacturer recommendation. *If unknown use highest setting: 360 J*

If Cardiac arrest, go to:
- **TAB 10** Cardiac arrest – VF/VT
- **TAB 9** Cardiac arrest – systole/PEA

**During RESUSCITATION**

Airway: Assess and Secure
Circulation: Confirm adequate IV or Intraosseous access
Consider IV fluids wide open

---

Reconsider Your Diagnosis

EMERGENCY MANUAL

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March 31, 2020
8 Bradycardia - Unstable

**HR < 50 bpm with hypotension, ischemic chest pain, altered mental status or shock**

---

START

1. **Call “Anesthesia STAT” and ask for a code cart**
   - **Ask:** “Who will be the Event manager?”
2. **Turn FiO2 to 100%**
3. **Stop Surgical Stimulation**
   - Bradycardia secondary to insufflation: **desufflate**
   - Administer 0.4 mg Glycopyrrolate, or 0.4 mg Atropine.
4. **Give Epinephrine 10 – 50 mcg (may repeat)**
   - Consider Epinephrine Infusion
5. **If Epinephrine ineffective**
   - Transcutaneous pacing
   - Transvenous pacing
6. **Consider:**
   - Turn off volatile anesthetics if patient unstable
   - Calling for expert consultation (Cardiology)
   - Assessing for drug-induced causes (e.g. beta-blockers, calcium channel blockers, digoxin)
   - Calling for Cardiology consult if myocardial ischemia suspected (e.g. EKG Changes)
8 Bradycardia - Unstable

HR < 50 bpm with hypotension, ischemic chest pain, altered mental status or shock

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<tr>
<td><strong>Atropine:</strong> 0.5 mg IV, may repeat up to 3 mg total</td>
</tr>
<tr>
<td><strong>Epinephrine:</strong> 2-10 mcg/min IV</td>
</tr>
<tr>
<td><strong>Dopamine:</strong> 2 – 20 mcg/kg/min IV</td>
</tr>
<tr>
<td><strong>Glycopyrrolate:</strong> 0.1 mg IV q 2 – 3 min PRN</td>
</tr>
</tbody>
</table>

**OVERDOSE treatments**

**Beta-blocker:** Glucagon: 2 - 4 mg IV push
**Calcium channel blocker:** Calcium chloride: 1 g IV
**Digoxin:** Digoxin Immune FAB; consult pharmacy for specific dosing

**TRANSCUTANEOUS PACING Instruction**

1. Place pacing electrodes front and back
2. Connect 3-lead ECG from pacing defibrillator to the patient
3. Turn monitor/defibrillator to **PACER** mode
4. Set **PACER RATE** (ppm) to 80/minute
5. Start at 60 mA of **PACER OUTPUT** and increase until electrical capture
6. Set final current to 10 mA above initial capture level
7. Confirm effective capture: (Mechanical pulse, ECG)

**During RESUSCITATION**

**Airway:** Assess and Secure
**Circulation:** Confirm adequate IV or Intraosseous access
Consider IV fluids wide open

**Critical Changes**

If PEA develops go to TAB 9

**Reconsider Your Diagnosis**
9 Cardiac Arrest – Asystole/PEA

Non-shockable pulseless cardiac arrest – confirm pulse and rhythm

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
   • Say: “The top priority is high quality CPR.”
2. Put backboard under patient, supine position
3. Turn FiO2 to 100%
4. Start CPR and assessment cycle
   • Perform CPR
     • Greater than 100 (> 100) compressions per minute
     • Compression Depth 2 inches:
       • Ensure full chest recoil with minimal interruptions
     • 10 breaths/min: do not overinflate
   • Give epinephrine
     • Epinephrine IV every 3 - 5 minutes
   • Assess every 2 minutes
     • Check rhythm, if rhythm organized check pulse
     • Change CPR/Compression provider
     • Check EtCO2
       • If: < 10 mmHg, reevaluate CPR technique
       • If: Sudden increase > 40 mmHg, may indicate return of spontaneous circulation
     • Draw Labs – ABG, Electrolytes
     • Consider Ultrasound (TTE, TEE)
   • If Asystole/PEA continues
     • Resume CPR/Assessment Cycle (Restart Step 4)
     • Read aloud Hs & Ts (see list in right column)
   • If VF/VT
     • Resume CPR - Go to TAB 10

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9 Cardiac Arrest – Asystole/PEA

Non-shockable pulseless cardiac arrest – confirm pulse and rhythm

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<td><strong>Epinephrine:</strong> 1 mg IV, repeat every 3-5 minutes</td>
</tr>
<tr>
<td><strong>TOXIN treatment:</strong></td>
</tr>
<tr>
<td><strong>Local anesthetic:</strong> Intralipid 100 mL IV bolus (Assuming 70 KG weight)</td>
</tr>
<tr>
<td>Repeat 1 – 2 times for persistent asystole</td>
</tr>
<tr>
<td>Infusion 0.25 – 0.5 mL/kg/min for 30 – 60 TAB 15</td>
</tr>
<tr>
<td><strong>Beta-blocker:</strong> Glucagon 2 – 4 mg IV push</td>
</tr>
<tr>
<td><strong>Calcium channel blocker:</strong> Calcium chloride 1 g IV</td>
</tr>
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<td><strong>HYPERKALEMIA treatment:</strong></td>
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<th>Hs &amp; Ts</th>
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<tr>
<td><strong>H+ Ion (Acidosis)</strong></td>
</tr>
<tr>
<td><strong>Hyperkalemia</strong></td>
</tr>
<tr>
<td><strong>Hypothermia</strong></td>
</tr>
<tr>
<td><strong>Hypovolemia</strong></td>
</tr>
<tr>
<td><strong>Hypoxia</strong></td>
</tr>
<tr>
<td><strong>Tamponade (Cardiac)</strong></td>
</tr>
<tr>
<td><strong>Tension pneumothorax</strong></td>
</tr>
<tr>
<td><strong>Thrombosis (Pulmonary)</strong></td>
</tr>
<tr>
<td><strong>Thrombosis (Coronary)</strong></td>
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<tr>
<td><strong>Toxin (LA, β, Ca Blockers)</strong></td>
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<table>
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<tr>
<th>During CPR</th>
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<tbody>
<tr>
<td><strong>Airway:</strong> Assess and Secure</td>
</tr>
<tr>
<td><strong>Circulation:</strong> Confirm adequate IV or Intraosseous access</td>
</tr>
<tr>
<td>Consider IV fluids wide open</td>
</tr>
<tr>
<td><strong>Assign roles:</strong> Chest compressions, Airways, Vascular access, Documentation, Code cart, Time keeping, Reader, Medications</td>
</tr>
</tbody>
</table>

Reconsider Your Diagnosis
Cardiac Arrest – VF/VT

Shockable pulseless cardiac arrest – confirm pulse and rhythm

START

1. Call “Anesthesia STAT” and ask for a code cart
   - **Ask**: “Who will be the Event manager?”
   - **Say**: “Shock the patient as soon as defibrillator arrives”
2. Put backboard under patient, supine position
3. Turn FiO2 to 100%, turn off volatile anesthetics
4. Start CPR and assessment cycle
   - Greater than 100 (> 100) compressions per minute
   - **Compression Depth 2 inches**:
     - Ensure full chest recoil with minimal interruptions
   - **10 breaths/min**: do not overinflate
   - **Defibrillate**
     - Shock at highest setting – **360J**
     - Resume CPR immediately after shock
   - **Give epinephrine**
     - Epinephrine IV every 3 – 5 minutes
   - **Consider giving anti-arrhythmics for refractory VF/VT**
     - Amiodarone preferred if available
   - **Assess every 2 minutes**
     - Change CPR/Compression provider
     - Check EtCO2
       - If: < 10 mmHg, reevaluate CPR technique
       - If: Sudden increase > 40 mmHg, may indicate return of spontaneous circulation
     - Read aloud Hs & Ts (**see list in right column**)  
     - Check rhythm, if rhythm organized check pulse
     - **If VF/VT continues** Resume CPR/Defibrillation/Assessment Cycle
     - **If Asystole/PEA - Go to TAB 9**
     - **Check labs - ABG Electrolytes**
10 Cardiac Arrest – Asystole/PEA

**Shockable pulseless cardiac arrest – confirm pulse and rhythm**

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</tr>
<tr>
<td><strong>ANTIARRHYTHMICS</strong></td>
</tr>
<tr>
<td><strong>Amiodarone:</strong></td>
</tr>
<tr>
<td>1st dose: 300 mg IV/IO</td>
</tr>
<tr>
<td>2nd dose: 150 mg/IV/IO</td>
</tr>
<tr>
<td><strong>Magnesium:</strong> 1 to 2 grams IV/IO for Torsades de Pointes</td>
</tr>
</tbody>
</table>

**DEFIBRILLATION instructions**

1. Place electrodes on chest.
2. Turn defibrillator ON, set to DEFIB mode, and increase ENERGY LEVEL ...
   • Follow manufacturer recommendation; if unknown use highest setting; **360 J**
3. Deliver shock press CHARGE then press SHOCK.

**Hs & Ts**

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<th>Tamponade (Cardiac)</th>
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**During CPR**

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<tr>
<td>Consider IV fluids wide open</td>
<td></td>
</tr>
<tr>
<td>Assign roles:</td>
<td>Chest compressions, Airways, Vascular access, Documentation, Code cart, Time keeping, Reader, Medications</td>
</tr>
</tbody>
</table>

Reconsider Your Diagnosis

EMERGENCY MANUAL

Version 1.0
March 31, 2020
11 Myocardial Ischemia

Depression or elevation of ST segment, arrhythmias, regional wall motion abnormalities

START

1. Call “Anesthesia STAT” and ask for a code cart
   - Ask: “Who will be the Event Manager?”
2. Increase FiO2 to 100%
3. Check mechanical pulse and blood pressure
4. Verify Ischemia (Expanded or 12 lead EKG)
5. Treat Ischemia
   - Slow Heart rate (Consider Beta-blockers)
   - Optimize blood pressure
   - Assess volume status
6. Reassess ischemia (Consider etiology)
7. Prepare for arrhythmias, consider placing pads.
8. Consider TTE or TEE for monitoring volume status and regional wall motion abnormalities
   1. STEMI/CARDIOLOGY Consult – STAT
   2. Consider Arterial Line (ABG,CBC, Troponins, Electrolytes)
   3. Consider central venous access
   4. If hemodynamically unstable consider support (IABP, Perfusionists)
   5. Global assessment: Elicit opinions

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Myocardial Ischemia

Depression or elevation of ST segment, arrhythmias, regional wall motion abnormalities

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta-blocker:</strong></td>
</tr>
<tr>
<td><strong>NTG Infusion:</strong></td>
</tr>
<tr>
<td><strong>Heparin as indicated:</strong></td>
</tr>
<tr>
<td><strong>Aspirin:</strong></td>
</tr>
<tr>
<td><strong>Narcotic:</strong></td>
</tr>
<tr>
<td><strong>Vasopressin:</strong></td>
</tr>
<tr>
<td><strong>Infusion:</strong></td>
</tr>
<tr>
<td><strong>Epinephrine:</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Norepinephrine:</strong></td>
</tr>
</tbody>
</table>

Caveats

- Hold Beta-blocker for bradycardia or hypotension
- Hold NTG for hypotension
- If anemic give PRBC
- Discuss ASA with surgeon
- Treat pain with narcotics

ST Changes

- 0.5 mm down-sloping ST indicates ischemia
- 1 – 2 mm down-sloping ST indicates NSTEMI
- 2 mm elevation of ST indicates ischemia

Reconsider Your Diagnosis
12 Malignant Hyperthermia

In presence of triggering agent: unexplained increase in EtCO2, unexplained tachycardia / tachypnea, prolonged masseter muscle spasm after succinylcholine. Hyperthermia is a late sign.

START

1. Call “Anesthesia STAT” and ask for a code cart
   - Ask: “Who will be the Event manager?”
2. Get Malignant Hyperthermia Cart
3. Turn off volatile anesthetics and transition to non-triggering anesthetics
   - DO NOT delay treatment to change circuit or CO2 absorber
   - Charcoal filter on inspiratory and expiratory limb of circuit
   - Ventilate with ambu-bag (self inflating bag) FiO2 100%
   - Hyperventilate patient at flows of 10 L/min or more
4. Assign dedicated person to mix Ryanodex
5. Terminate procedure if possible
6. Give Ryanodex
7. Place Arterial Line
8. Send Labs – ABG, Electrolytes, CK, Coags, Serum and Urine Myoglobin)
9. Aggressive fluid resuscitation Initiate supportive care
   - Cool if temperature > 39°C (Stop if < 38°C)
   - Lavage open body cavities, cold NG lavage, Ice externally
   - Consider bicarbonate for suspected metabolic acidosis (pH <7.2)
   - Monitor urine output
   - Treat hyperkalemia if suspected
   - Treat dysrhythmias, if present.
     - DO NOT use Calcium channel blockers
10. Monitor in ICU for 24 hours
Malignant Hyperthermia

*In presence of triggering agent: unexplained increase in EtCO2, unexplained tachycardia / tachypnea, prolonged masseter muscle spasm after succinylcholine. Hyperthermia is a late sign.*

**DRUG DOSES and treatments**

**Ryanodex**
Reconstitute 250 mg vial with 5 cc sterile water (shake until orange/opaque)

**Dose:**
- 2.5 mg/kg = 0.05 mL/kg
- 70 kg patient = 3.5 mL

**Bicarbonate:**
1 – 2 mEq/kg. Slow IV push

**HYPERKALEMIA Treatment:**
- Calcium gluconate: 30 mg/kg IV
- Calcium chloride: 10 mg/kg
- Insulin: 10 units IV with 1 – 2 amps D5%W IV

**TRIGGERING AGENTS**

- Inhalational Anesthetics
- Succinylcholine

**DIFFERENTIAL DIAGNOSIS (Consider when using high doses of Ryanodex without resolution of symptoms)**

<table>
<thead>
<tr>
<th>Cardiorespiratory</th>
<th>Iatrogenic</th>
<th>Neurologic</th>
<th>Toxicology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoventilation</td>
<td>Exogenous CO2</td>
<td>Meningitis</td>
<td>IV Dye neurotoxicity</td>
</tr>
<tr>
<td>Pheochromocytoma</td>
<td>Overwarming</td>
<td>Intracranial bleed</td>
<td>Anticholinergic syndrome</td>
</tr>
<tr>
<td>Endocrine</td>
<td>Neuroleptic</td>
<td>Hypoxic encephalopathy</td>
<td>Cocaine, amphetamine, salicylate withdrawal</td>
</tr>
<tr>
<td>Thyrotoxicosis</td>
<td>Sepsis</td>
<td>Traumatic brain injury</td>
<td>Alcohol withdrawal</td>
</tr>
</tbody>
</table>

**Reconsider Your Diagnosis**
13 Air Embolism - Venous

*Decreased end-tidal CO2, decreased oxygen saturation, hypotension, precordial doppler (mill-wheel murmur), TEE (Bubbles detected in RA/RV)*

**START**

1. **Call “Anesthesia STAT” and ask for a code cart**
   - **Ask:** “Who will be the Event Manager?”
2. **Turn FiO\textsubscript{2} to 100%**
3. **Stop source of air entry**
   - Fill wound / surgical field with irrigation
   - Lower surgical site below level of heart, if possible
   - Search for entry point (including open venous lines, CO2 embolism during laparoscopy)
4. **Turn off nitrous oxide**
5. **Consider:**
   - Positioning patient with left side down
   - Continue appropriate monitoring while repositioning
   - Placing bone wax or cement on bone edges (in neurosurgery)
   - Transesophageal echocardiography (TEE) if diagnosis unclear
   - Using ETCO2 to monitor progression and resolution of embolus or for assessment of adequate cardiac output
13 Air Embolism - Venous

Decreased end-tidal CO2, decreased oxygen saturation, hypotension, precordial doppler (mill-wheel murmur), TEE (Bubbles detected in RA/RV)

SUPPLEMENTAL MONITORS

<table>
<thead>
<tr>
<th>Supplemental Monitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Precordial Doppler:</strong></td>
</tr>
<tr>
<td>Place at left sternal border</td>
</tr>
<tr>
<td>Listen for &quot;mill-wheel&quot; murmur</td>
</tr>
<tr>
<td><strong>TTE or TEE:</strong></td>
</tr>
<tr>
<td>Look for air entrained into right side of heart</td>
</tr>
<tr>
<td>Evaluate for patent foramen ovale</td>
</tr>
</tbody>
</table>

CRITICAL CHANGES

If PEA develops go to TAB 9

Reconsider Your Diagnosis

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Transfusion Reactions

Hemolytic reactions: Fever, back / flank pain, tachycardia, tachypnea, hypotension, dark urine, disseminated intravascular coagulation (DIC)

Febrile reactions: Fever, chills / rigors, headache, vomiting

Anaphylactic reactions: Hypotension, Urticaria / Hives, wheezing, tachycardia

Hypotensive Reactions to Angiotensin Converting Enzyme Inhibitors: Hypotension in reaction to transfusion in patients on ACE inhibitors

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Stop transfusion
3. Increase FiO2 to 100%
4. Support blood pressure with IV fluids and vasoactive medications if needed
5. Consult BLOOD BANK if advice needed
6. If Anaphylactic Reaction go to TAB 16
7. Consider hypotensive reaction to Angiotensin Converting Enzyme inhibitors
   • Treat with vasopressin bolus / infusion
8. TRALI or volume overload if evidence of lung injury (hypoxemia, pulmonary edema).
   • May require post-operative ventilation
Hemolytic reactions: Fever, back / flank pain, tachycardia, tachypnea, hypotension, dark urine, disseminated intravascular coagulation (DIC)

Febrile reactions: Fever, chills / rigors, headache, vomiting

Anaphylactic reactions: Hypotension, Urticaria / Hives, wheezing, tachycardia

Hypotensive Reactions to Angiotensin Converting Enzyme Inhibitors: Hypotension in reaction to transfusion in patients on ACE inhibitors

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Epinephrine:</strong></td>
</tr>
<tr>
<td>BOLUS: 10 – 100 mcg IV</td>
</tr>
<tr>
<td>Repeat as needed</td>
</tr>
<tr>
<td>(dilute 1 mg in 10 mL (100 mcg/mL), then 1 cc in 10cc NS (10 mcg/mL)</td>
</tr>
<tr>
<td><strong>Vasopressin:</strong></td>
</tr>
<tr>
<td>BOLUS: 1 – 2 units IV</td>
</tr>
<tr>
<td>Infusion: 1 – 4 U/Hr.</td>
</tr>
<tr>
<td><strong>Diphenhydramine:</strong></td>
</tr>
<tr>
<td>25 – 50 mg IV</td>
</tr>
<tr>
<td><strong>H2 Blockers:</strong></td>
</tr>
<tr>
<td>Famotidine: 20 mg IV</td>
</tr>
<tr>
<td><strong>Hydrocortisone:</strong></td>
</tr>
<tr>
<td>100 mg IV</td>
</tr>
<tr>
<td><strong>Albuterol:</strong></td>
</tr>
<tr>
<td>2 – 5 mg nebulized or Mini-dose inhaler</td>
</tr>
</tbody>
</table>

Reconsider Your Diagnosis
15 Local Anesthetic Toxicity

Tinnitus, metallic taste, altered mental status, fasciculations, seizures, hypotension, bradycardia, ventricular arrhythmias, cardiovascular collapse

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the crisis manager?”
2. Turn FiO$_2$ to 100% and turn down volatile anesthetics – stop local anesthetic
3. Call for Intralipid kit – (Omnicell under Lipid Emulsion)
4. Give Intralipid according to dosing on facing page
5. Treat seizure activity with Benzodiazepines
6. Monitor for hemodynamic instability – treat hypotension
   • Consider CPR if needed
7. Variable arrhythmias:
   • Consider reducing epinephrine doses (< 1 mcg/kg)
   • Avoid vasopressin, calcium channel blockers, beta-blocker, and local anesthetics
8. If refractory to treatment, alert personnel for potential cardiopulmonary bypass
9. Prolonged resuscitation is expected
10. Monitor the patient post event in the ICU
15 Local Anesthetic Toxicity

Tinnitus, metallic taste, altered mental status, fasciculations, seizures, hypotension, bradycardia, ventricular arrhythmias, cardiovascular collapse

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intralipid: Rapidly give: 1.5 mL/kg bolus of 20% Intralipid IV</td>
</tr>
<tr>
<td>Infusion: 0.25 mL/kg/min</td>
</tr>
<tr>
<td>May increase to maximum of 0.5 mL/kg/min</td>
</tr>
<tr>
<td>Note: Continue for at least 10 minutes after obtaining circulatory stability</td>
</tr>
</tbody>
</table>

SUPPLEMENTAL Drugs:

Epinephrine: BOLUS: 10 – 100 mcg IV
Repeat as needed
(dilute 1 mg in 10 mL (100 mcg/mL), then 1 cc in 10cc NS (10 mcg/mL)

Vasopressin: Bolus: 1 – 2 units IV
Infusion: 1 – 4 U/Hr.

Norepinephrine: Infusion: 8 – 30 mcg/min

Reconsider Your Diagnosis

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Anaphylaxis

Hypotension, bronchospasm, high peak-airway pressures, decrease or lack of breath sounds, tachycardia, urticaria

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Open IV fluids and/or give large fluid bolus
3. Remove potential causative agents
4. Turn FiO₂ to 100%
5. Give epinephrine bolus (may be repeated)
   • Epi-pens are available in OMNICELLS—consider as first line.
     • Dosing 300 mcg IM
   • Epinephrine 10 – 100 mcg IV
   • Start epinephrine infusion as needed
6. Establish/secure airway – Potential airway edema
7. Consider:
   • Turning off volatile anesthetics if patient remains unstable
   • Vasopressin for patients with continued hypotension despite repeated doses of epinephrine
   • Diphenhydramine, H2 blockers, Hydrocortisone
   • Tryptase level: (Yellow top tube) Check within first hour, repeat at 4 hr. and at 18–24 hrs. post reaction
     • Histamine Levels. (Rises within 10 minutes)
   • Terminate procedure.
8. ICU Admission for 24 hours post event
16 Anaphylaxis

*Hypotension, bronchospasm, high peak-airway pressures, decrease or lack of breath sounds, tachycardia, urticaria*

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Epinephrine:</strong></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Vasopressin:</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Diphenhydramine:</strong></td>
</tr>
<tr>
<td><strong>H2 Blockers:</strong></td>
</tr>
<tr>
<td><strong>Hydrocortisone:</strong></td>
</tr>
<tr>
<td><strong>Albuterol:</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Common CAUSATIVE Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neuromuscular blocking agents</td>
</tr>
<tr>
<td>Latex products</td>
</tr>
<tr>
<td>Chlorhexidine Surgical Scrub</td>
</tr>
</tbody>
</table>

Reconsider Your Diagnosis
1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Get Fire Extinguisher to have as needed.
3. Activate R.A.C.E. management of fire emergency
   • R: Move patients and assist visitors or impaired employees away from immediate danger
   • A: Alert others, Activate manual pull station, Call front desk of OR
   • C: Confine: Close doors and windows Contain smoke Turn off oxygen where appropriate
   • E: Extinguish fire with appropriate fire extinguisher
### Fire

**Evidence of fire (smoke, odor, flash) on patient or drapes, in patient’s airway, or in room**

<table>
<thead>
<tr>
<th>AIRWAY Fire</th>
<th>NON AIRWAY Fire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATTEMPT TO EXTINGUISH FIRE</strong></td>
<td></td>
</tr>
<tr>
<td>• Shut off medical gases</td>
<td></td>
</tr>
<tr>
<td>• Disconnect ventilator</td>
<td></td>
</tr>
<tr>
<td>• Remove endotracheal tube</td>
<td></td>
</tr>
<tr>
<td>• Remove flammable material from airway</td>
<td></td>
</tr>
<tr>
<td>• Pour saline into airway</td>
<td></td>
</tr>
<tr>
<td><strong>After fire extinguished</strong></td>
<td></td>
</tr>
<tr>
<td>• Re-establish ventilation using ambu bag with room air</td>
<td></td>
</tr>
<tr>
<td>• Confirm no secondary fire</td>
<td></td>
</tr>
<tr>
<td>• Check surgical field, drapes and towels</td>
<td></td>
</tr>
<tr>
<td>• Assess airway for injury or foreign body</td>
<td></td>
</tr>
<tr>
<td>• Assess ETT integrity (fragments may be left in airway)</td>
<td></td>
</tr>
<tr>
<td>• Consider bronchoscopy, airway humidification, bronchodilators.</td>
<td></td>
</tr>
</tbody>
</table>

**Assess patient status and devise ongoing management plan**

**Save involved materials/devices for review**

<table>
<thead>
<tr>
<th>ATTEMPT TO EXTINGUISH FIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Attempt</strong></td>
</tr>
<tr>
<td>• Avoid N₂O and minimize FiO₂</td>
</tr>
<tr>
<td>• Remove drapes / all flammable materials from patients</td>
</tr>
<tr>
<td>• Extinguish burning materials with saline or saline-soaked gauze</td>
</tr>
<tr>
<td>• Use fire extinguisher if appropriate</td>
</tr>
<tr>
<td>• <strong>DO NOT USE</strong></td>
</tr>
<tr>
<td>• Alcohol-based solutions</td>
</tr>
<tr>
<td>• Any liquid on or in energized electrical equipment (Laser, Bovie, anesthesia machine, etc.)</td>
</tr>
<tr>
<td>• If equipment fire use fire extinguisher</td>
</tr>
</tbody>
</table>

**Fire PERSISTS after 1 attempt**

• Use fire extinguisher (safe in wounds)

**Fire STILL PERSISTS**

• Evacuate patient
• Close OR door
• Turn OFF gas supply to room

**After fire extinguished**

• Maintain airway / FiO2 to 100%
• Assess patient for injury at site of fire, and for inhalational injury if not intubated
• Confirm no secondary fire
• Check surgical field, drapes and towels

**Assess patient status and devise ongoing management plan**

**Save involved material/devices for review**
18 Total Spinal Anesthesia

After Neuraxial Anesthesia Block: Unexpected rapid rise in sensory blockade, numbness or weakness in upper extremities (hand grip weak), dyspnea, bradycardia, hypotension (or nausea/vomiting), loss of consciousness, apnea, cardiac arrest

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event manager?”
2. Increase FiO2 to 100%
3. Give IV fluid bolus
4. Stop epidural infusion if present
5. If Cardiac Arrest: Start CPR
   • If VT/VF go to TAB 10
   • If Asystole / PEA go to TAB 9
   • Support ventilation and intubate if necessary
6. Treat significant bradycardia or hypotension
   • Severe Bradycardia: Epinephrine 10 – 100 mcg IV, increase as needed (FIRST CHOICE) go to TAB 8
   • Mild Bradycardia: Ephedrine 5 – 10 mg, Atropine 0.5 – 1 mg IV
   • Hypotension go to TAB 6
7. If parturient: Left uterine displacement, call OB and neonatology, prepare for possible emergent C-section, monitor fetal heart rate.
8. Consider sedation to prevent awareness

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Rapid reversal of antiplatelet and/or Target-specific oral anticoagulants

Surgical-trauma patients with life threatening hemorrhage and/or intracranial hemorrhage

START

**Antiplatelet Agents**
- Aspirin
- Clopidogrel (Plavix)
- Prasugrel (Efficient)
- Ticagrelor (Brilinta)
- Ticlopidine (Ticlid)
- Cilostazol (Pletal)

One apheresis platelet pack
Consider additional platelets if bleeding persists
Consider desmopressin (DDAVP) 0.3 mcg/kg IV over 15 min in 50 mL NS

**Direct Thrombin Inhibitors**
- Dabigatran (Pradaxa)
- Bivalirudin (Angiomax)
- Agatroban
  - PT may not be sensitive, PTT prolonged by high doses, INR can be falsely elevated

Based on TEG results, consider 2 units FFP ASAP
Consider DDAVP (desmopressin) 0.3 mcg/kg IV over 15 min in 50 mL NS

**Factor Xa Inhibitors**
- Rivaroxaban (Xarelto)
- Apixaban (Eliquis)
  - PT prolonged in a concentration-dependent manner; may not be sensitive

Consider prothrombin complex concentrate (4-factor Kcentra) 50 units/kg (maximum 5000 units) IV x 1 DO NOT REPEAT

**Laboratory Studies**
- PT/INR, Fibrinogen, PTT, Hemoglobin, Platelet Type and Cross
- Consider Rapid TEG

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Rapid reversal of antiplatelet and/or target-specific oral anticoagulants

Surgical-trauma patients with life threatening hemorrhage and/or intracranial hemorrhage

**Vitamin K Dependent Reversal**

**PT/INR, Fibrinogen/PTT**

**Trauma:** Hgb, PLT, Type and Cross

### INR < 1.4
- Reversal Adequate
- INR < 1.4

### INR > 1.4 - 1.9
- Admit to ICU
- Vitamin K 10 mg IV x 1 dose STAT
- Give 2 units FFP ASAP
- If platelet <60 give 1 apheresis platelet pack
- If Fibrinogen <100mg/dL give 10 u Cryoprecipitate or 2u additional FFP
- Repeat INR Q6h x 24h or until adequately reversed

### INR > 1.9
- Admit to ICU
- Vitamin K 10 mg IV x 1
- Give 2 units FFP
- Prothrombin complex Concentrate (4-factor) (Kcentra)
  - INR 2-4: 25 units/kg (Max 2500u)
  - INR 4-6: 35 units/kg (Max 3500u)
  - INR >6: 50 units/kg (Max 5000u)
- DO NOT REPEAT
- Consider Platelet transfusion
- Repeat INR Q 2 hours until < 1.4
- Consider TEG

**INR > 1.4**

**INR > 1.9**

Consider more FFP if clinically indicated
A2 Delayed Emergence

**Failure to return to normal consciousness in a timely fashion**

---

**START**

1. **Confirm** all anesthetic agents (IV/inhalational) are OFF

2. **Check for residual muscle relaxation**
   - Verify NMB reversal, TOF status.

3. **Consider:**
   - Take patient to PACU/ICU intubated
   - NMB Reversal with Sugammadex (High dose vs. low dose)
   - Opioid reversal: Naloxone
   - Benzodiazepine reversal: Flumazenil
   - Scopolamine reversal: Physostigmine (potential cholinergic crisis, including severe bradycardia responsive to atropine)

4. **Call for help**

5. **Neuro Exam**
   - **Look for focal neurologic deficits** (pupils, asymmetric movement, gagging, etc.)
   - Suspect Stroke (abnormal exam) obtain stat Head CT

6. **Check for medications swap or dosing error**

7. **Labs:** ABG, electrolytes, glucose, temperature

---

**EMERGENCY MANUAL**

Version 1.0
March 31, 2020
A2 Delayed Emergence

Failure to return to normal consciousness in a timely fashion

<table>
<thead>
<tr>
<th>Rule Out Other Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypoxemia</td>
</tr>
<tr>
<td>Hypercarbia</td>
</tr>
<tr>
<td>Hypothermia</td>
</tr>
<tr>
<td>Medication error</td>
</tr>
<tr>
<td>Hypermagnesemia</td>
</tr>
<tr>
<td>Hyponatremia</td>
</tr>
<tr>
<td>Hypoglycemia</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DRUG DOSES and treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narcan (Naloxone):</td>
</tr>
<tr>
<td>Flumazenil</td>
</tr>
<tr>
<td>Physostigmine</td>
</tr>
<tr>
<td>Sugammadex Doses:</td>
</tr>
<tr>
<td>Max dosen for reversal of rocuronium after induction</td>
</tr>
</tbody>
</table>

40 mcg IV (Max 400 mcg)
0.2 mg IV (Max 1 mg)
1 mg IV
4 mg/kg if TOF 1-2 post tetanic stimulation
2 mg/kg if TOF 2 twitches
16 mg/kg immediate reversal of rocuronium after induction
A3 Amniotic Fluid Embolism

Respiratory distress, decreased SaO2, cardiovascular collapse, coagulopathy, disseminated intravascular coagulopathy (DIC), seizures

START

1. Call “Anesthesia STAT” and ask for a code cart
   • Ask: “Who will be the Event Manager?”
2. Turn FiO2 to 100%
3. Cardiopulmonary arrest and C-section
   • Plan emergent delivery
   • Consider TTE or TEE
   • Support ventilation
4. Place patient in left uterine displacement (LUD)
5. Establish large volume IV Access
6. Prepare for emergent intubation
7. When possible place arterial line
8. Support circulation
   • IV fluids, vasopressors and ionotropes
9. Anticipate massive hemorrhage and DIC
10. Consider circulatory support (Page 9-ECMO)
## A3 Amniotic Fluid Embolism

*Respiratory distress, decreased SaO2, cardiovascular collapse, coagulopathy, disseminated intravascular coagulopathy (DIC), seizures*

<table>
<thead>
<tr>
<th>Rule Out Other Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia</td>
</tr>
<tr>
<td>Air Embolism</td>
</tr>
<tr>
<td>Anaphylaxis</td>
</tr>
<tr>
<td>Anesthetic Overdose</td>
</tr>
<tr>
<td>Cardiomyopathy/MI</td>
</tr>
<tr>
<td>Total spinal</td>
</tr>
<tr>
<td>Hemorrhage</td>
</tr>
<tr>
<td>Aspiration</td>
</tr>
<tr>
<td>Pulmonary Embolism</td>
</tr>
<tr>
<td>Sepsis</td>
</tr>
<tr>
<td>Local anesthetic toxicity</td>
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</tbody>
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Crisis Management

Call “Anesthesia Stat”

Designate the Event Manager and other roles

State the diagnosis and plan out loud

Primary Diagnosis Group Statement
Airway (Failed, Difficult, etc.), Respiratory (Hypoxia, pneumothorax, etc.) Cardiac (Ischemia, VF/VT, etc.)

Critical Abnormality Noted
Relevant Medical or Surgical History
Initial Treatment Initiated

Request Input

Avoid Critical Errors in Thinking
Reconsider your diagnosis

EMERGENCY MANUAL

Version 1.0
March 31, 2020
Contact Phone Numbers - HELP

<table>
<thead>
<tr>
<th>FROM OUTSIDE</th>
<th>EAST Campus</th>
<th>WEST Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>(617) 63X-XXXX</td>
<td>(617) 75X-XXXX</td>
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<tr>
<td>BLOOD BANK</td>
<td>74480</td>
<td>43300</td>
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<tr>
<td>STAT LAB</td>
<td>75227</td>
<td>43230</td>
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<tr>
<td>PACU</td>
<td>73905 Feldberg</td>
<td>42800</td>
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<tr>
<td>FRONT DESK</td>
<td>72411</td>
<td>43000</td>
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</table>

**STAT Help at night (West):** ICU attending
1) Open paging system or Anesthesia Intranet
2) Type “ICU” into ‘On-Call Schedule Search’
3) Find “ICU Attending On Call All Units” – these are all Anesthesia attendings except one (ER intensivist)
   - May also find Anesthesia Fellow/residents under ICU Fellow or ‘On Call’ TSICU/SICU Residents

Other: Late 3 attending *(see Qgenda)* - keep in mind this person is home call
If still need further help: Consider Heart/Transplant Team

**Help at night (East):** East Attending or OB Team
- Open Anesthesia Intranet -> Overnight tab -> East Attending and OB Attending/Residents

**OB Front Desk**
**Cardiology consult:** (i.e. acute coronary syndrome)
1) Open paging system -> type “cardiology daytime” -> Page the consult fellow or consult attending for questions/consults

**Pacemaker/ICD:**
1) Open paging system -> type “EP” -> click “view on call now” -> page EP consult fellow between hours of 8 AM to 5 PM
2) If after 5 PM -> type “cardiology off-hours” -> Page the Fellow (first option) 
   -One cardiology fellow is in house overnight to answer questions and provide assistance

Hint: If you know about these patients the day before, please page the EP fellow or cards consult fellow to let them know when/where you want them to meet the patient (i.e. preoperative holding 30-45 min before procedure starts)

**Suspected PE:**
1) Open paging system -> type “MASCOT” -> this gets on call cardiology fellow who will evaluate and contact Cards, Pulmonary, IR, Vascular, Heme/Onc, etc.

**Suspected inpatient stroke:**
1) Call (617) 632-1212 and ask for STROKE STAT
2) Open paging system -> type “STROKE” for ‘Stroke Fellow or Attending’

**Perfusion**
1) 9- ECMO (Cardiologist)

**Surgical Airway Consult**
1) ACS Call West X43000, East X42111
## Operating Room Crisis Checklists

The use of this manual is meant as a guideline and reference. It is not meant to be a substitute for training and experience.

Color code:
- Blue – Respiratory
- Red – Cardiac
- Green – Other
- Yellow – Reference

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<table>
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<tbody>
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<td>1.</td>
<td>Failed Airway</td>
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<tr>
<td>2.</td>
<td>Hypoxia</td>
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<td>3.</td>
<td>Bronchospasm</td>
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<td>4.</td>
<td>Pneumothorax</td>
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<td>5.</td>
<td>Hemorrhage</td>
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<tr>
<td>6.</td>
<td>Hypotension</td>
</tr>
<tr>
<td>7.</td>
<td>Tachycardia – Unstable</td>
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<tr>
<td>8.</td>
<td>Bradycardia – Unstable</td>
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<tr>
<td>9.</td>
<td>Cardiac Arrest – Asystole/PEA</td>
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<tr>
<td>10.</td>
<td>Cardiac Arrest – VF/VT</td>
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<tr>
<td>11.</td>
<td>Myocardial Ischemia</td>
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<td>12.</td>
<td>Malignant Hyperthermia</td>
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<td>13.</td>
<td>Air Embolism – Venous</td>
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<td>14.</td>
<td>Transfusion Reactions</td>
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<td>15.</td>
<td>Local Anesthetic Toxicity</td>
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<tr>
<td>16.</td>
<td>Anaphylaxis</td>
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<td>17.</td>
<td>Fire</td>
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<td>18.</td>
<td>Total Spinal Anesthesia</td>
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<td>19.</td>
<td>Appendices - References</td>
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