

Operating Room Crisis Checklists

>> **Do not remove book from this room** <<



Based on the OR Crisis Checklists at www.projectcheck.org/crisis. All reasonable precautions have been taken to verify the information contained in this publication. The responsibility for the interpretation and use of the materials lies with the reader.



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SUSPECTED EVENT

Air Embolism – Venous

Anaphylaxis

Bradycardia – Unstable

Cardiac Arrest – Asystole/PEA

Cardiac Arrest – VF/VT

Failed Airway

Fire

Hemorrhage

Hypotension

Hypoxia

Malignant Hyperthermia

Tachycardia – Unstable

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1 Air Embolism – Venous

Decreased end-tidal CO₂, decreased oxygen saturation, hypotension

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Turn FiO₂ to 100%**
- 3 **Turn off nitrous oxide**
- 4 **Stop source of air entry**
 - ▶ Fill wound with irrigation
 - ▶ Lower surgical site below level of heart, if possible
 - ▶ Search for entry point (including open venous lines)
- 5 **Consider...**
 - ▶ Positioning patient with left side down
 - Continue appropriate monitoring while repositioning
 - ▶ Placing bone wax or cement on bone edges
 - ▶ Transesophageal echocardiography (TEE) if diagnosis unclear
 - ▶ Using ET_{CO}₂ to monitor progression and resolution of embolus or for assessment of adequate cardiac output

Critical CHANGES

If **PEA** develops, go to ▷ CHKLST 4

2 Anaphylaxis

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

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Give epinephrine bolus** (may be repeated)
- 3 **Open IV fluids and/or give fluid bolus**
- 4 **Remove potential causative agents**
- 5 **Turn FiO₂ to 100%**
- 6 **Establish/secure airway**
- 7 **Consider...**
 - ▶ Turning off volatile anesthetics if patient remains unstable
 - ▶ Vasopressin for patients with continued hypotension despite repeated doses of epinephrine
 - ▶ Epinephrine infusion for patients who initially respond to bolus doses of epinephrine but experience continued symptoms
 - ▶ Diphenhydramine
 - ▶ H2 blockers
 - ▶ Hydrocortisone
 - ▶ Tryptase level: Check within first hour, repeat at 4 hr and at 18–24 hrs post reaction
 - ▶ Terminate procedure

DRUG DOSES and treatments

Epinephrine:	BOLUS: 10 – 100 mcg, repeat as necessary (dilute 1 mg in 250 mL = 4 mcg/mL)
	INFUSION: 1 – 10 mcg/min
Vasopressin:	1 – 2 units IV
Diphenhydramine:	25 – 50 mg IV
H2 blockers:	Ranitidine: 50 mg IV Cimetidine: 300 mg IV
Hydrocortisone:	100 mg IV

Common CAUSATIVE AGENTS

- Neuromuscular blocking agents
- Antibiotics
- Latex products
- IV contrast

Critical CHANGES

- If **cardiac arrest**, go to:
- ▷ CHKLST 4 Cardiac Arrest – Asystole / PEA
 - ▷ CHKLST 5 Cardiac Arrest – VF/VT

3 Bradycardia – Unstable

HR < 50 bpm with hypotension, acutely altered mental status, shock, ischemic chest discomfort, or acute heart failure

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Turn FiO₂ to 100%**
 - ▶ Verify oxygenation/ventilation adequate
- 3 **Give atropine**
- 4 **Stop surgical stimulation** (if laparoscopy, desufflate)
- 5 **If atropine ineffective:**
 - ▶ Start epinephrine or dopamine infusion
 - or –
 - ▶ Start transcutaneous pacing
- 6 **Consider...**
 - ▶ Turning off volatile anesthetics if patient remains unstable
 - ▶ Calling for expert consultation (e.g., Cardiologist)
 - ▶ Assessing for drug induced causes (e.g., beta blockers, calcium channel blockers, digoxin)
 - ▶ Calling for cardiology consultation if myocardial infarction suspected (e.g., ECG changes)

DRUG DOSES and treatments

Atropine: 0.5 mg IV, may repeat up to 3 mg total
 Epinephrine: 2 – 10 mcg/min IV
 – or – Dopamine: 2 – 20 mcg/kg/min IV

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 patient-specific dosing

TRANSCUTANEOUS PACING instructions

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
(adjust based on clinical response once pacing is established)
5. Start at 60 mA of PACER OUTPUT and increase until electrical capture
(pacer spikes aligned with QRS complex)
6. Set final milliamperes 10 mA above initial capture level
7. Confirm effective capture
 - Electrically: assess ECG tracing
 - Mechanically: palpate femoral pulse (carotid pulse unreliable)

Critical CHANGES

If **PEA** develops, go to ▶ CHKLST 4

During RESUSCITATION

Airway: Assess and secure
 Circulation:

- Confirm adequate IV or IO access
- Consider IV fluids wide open

4 Cardiac Arrest – Asystole / PEA

Asystole

PEA



Non-shockable pulseless cardiac arrest

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
 - ▶ **Say:** “The top priority is high-quality CPR”
- 2 **Put backboard under patient, supine position**
- 3 **Turn FiO₂ to 100%, turn off volatile anesthetics**
- 4 **Start CPR and assessment cycle...**
 - ▶ **Perform CPR**
 - “Hard and fast” about 100–120 compressions/min to depth of 2–2.3 inches
 - Ensure full chest recoil with minimal interruptions
 - 10 breaths/minute, do not overventilate
 - ▶ **Give epinephrine**
 - Repeat epinephrine every 3–5 minutes
 - ▶ **Assess every 2 minutes**
 - Change CPR compression provider
 - Check ETCO₂
 - If: < 10 mm Hg, evaluate CPR technique
 - If: Sudden increase to > 40 mm Hg, may indicate return of spontaneous circulation
 - Check rhythm; if rhythm organized check pulse
 - If: Asystole/PEA continues:
 - Resume CPR and assessment cycle (restart Step 4)
 - Read aloud Hs & Ts (see list in right column)
 - If: VF/VT
 - Resume CPR
 - go to ▷ CHKLST 5

DRUG DOSES and treatments

Epinephrine: 1 mg IV, repeat every 3–5 mins.

TOXIN treatment

Local anesthetic: • Intralipid 1.5 mL/kg IV bolus
 • Repeat 1–2 times for persistent asystole
 • Start infusion 0.25–0.5 mL/kg/min for 30–60 minutes for refractory hypotension

Beta-blocker: Glucagon 2–4 mg IV push

Calcium channel blocker: Calcium chloride 1 g IV

HYPERKALEMIA treatment

1. Calcium gluconate • 30 mg/kg IV
 - or -
 Calcium chloride • 10 mg/kg IV
2. Insulin • 10 units regular IV with
 1–2 amps D50W as needed
3. Sodium bicarbonate if pH < 7.2 • 1–2 mEq/kg slow IV push

Hs & Ts

- | | | |
|---------------------------|-----------------------------------|---|
| • Hydrogen ion (acidosis) | • Hypoxia | • Toxin (local anesthetic, beta blocker, calcium channel blocker) |
| • Hyperkalemia | • Tamponade (cardiac) | |
| • Hypothermia | • Tension pneumothorax | |
| • Hypovolemia | • Thrombosis (coronary/pulmonary) | |

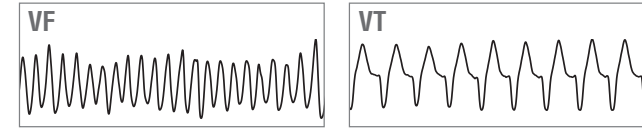
During CPR

Airway: Bag-mask sufficient (if ventilation adequate)

Circulation: • Confirm adequate IV or IO access
 • Consider IV fluids wide open

Assign roles: Chest compressions, Airway, Vascular access, Documentation, Code cart, Time keeping

5 Cardiac Arrest – VF/VT



Shockable pulseless cardiac arrest

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
 - ▶ **Say:** “Shock patient as soon defibrillator arrives”
- 2 **Put backboard under patient, supine position**
- 3 **Turn FiO₂ to 100%, turn off volatile anesthetics**
- 4 **Start CPR — defibrillation — assessment cycle**
 - ▶ **Perform CPR**
 - “Hard and fast” about 100–120 compressions/min to depth of 2–2.3 inches
 - Ensure full chest recoil with minimal interruptions
 - 10 breaths/minute, do not overventilate
 - ▶ **Defibrillate**
 - Shock at highest setting
 - Resume CPR immediately after shock
 - ▶ **Give epinephrine**
 - Repeat epinephrine every 3–5 minutes
 - ▶ **Consider giving antiarrhythmics for refractory VF/VT** (amiodarone preferred, if available)
 - ▶ **Assess every 2 minutes**
 - Change CPR compression provider
 - Check ETCO₂
 - If: < 10 mm Hg, evaluate CPR technique
 - If: Sudden increase to > 40 mm Hg, may indicate return of spontaneous circulation
 - Treat reversible causes, consider reading aloud Hs & Ts (see list in right column)
 - Check rhythm; if rhythm organized check pulse
 - If: VF/VT continues: Resume CPR–defibrillation–assessment cycle (restart Step 4)
 - If: Asystole/PEA: go to ▷ CHKLST 4

DRUG DOSES and treatments

Epinephrine: 1 mg IV, repeat every 3–5 mins.

ANTIARRHYTHMICS

Amiodarone: • 1st dose: 300 mg/IV/IO
• 2nd dose: 150 mg/IV/IO

Magnesium: 1 to 2 g IV/IO for Torsades de Pointes

DEFIBRILLATOR instructions

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

Hs & Ts

- | | | |
|---------------------------|-----------------------------------|---|
| • Hydrogen ion (acidosis) | • Hypoxia | • Toxin (local anesthetic, beta blocker, calcium channel blocker) |
| • Hyperkalemia | • Tamponade (cardiac) | |
| • Hypothermia | • Tension pneumothorax | |
| • Hypovolemia | • Thrombosis (coronary/pulmonary) | |

During CPR

- Airway:** Bag-mask sufficient (if ventilation adequate)
- Circulation:**
 - Confirm adequate IV or IO access
 - Consider IV fluids wide open
- Assign roles:** Chest compressions, Airway, Vascular access, Documentation, Code cart, Time keeping

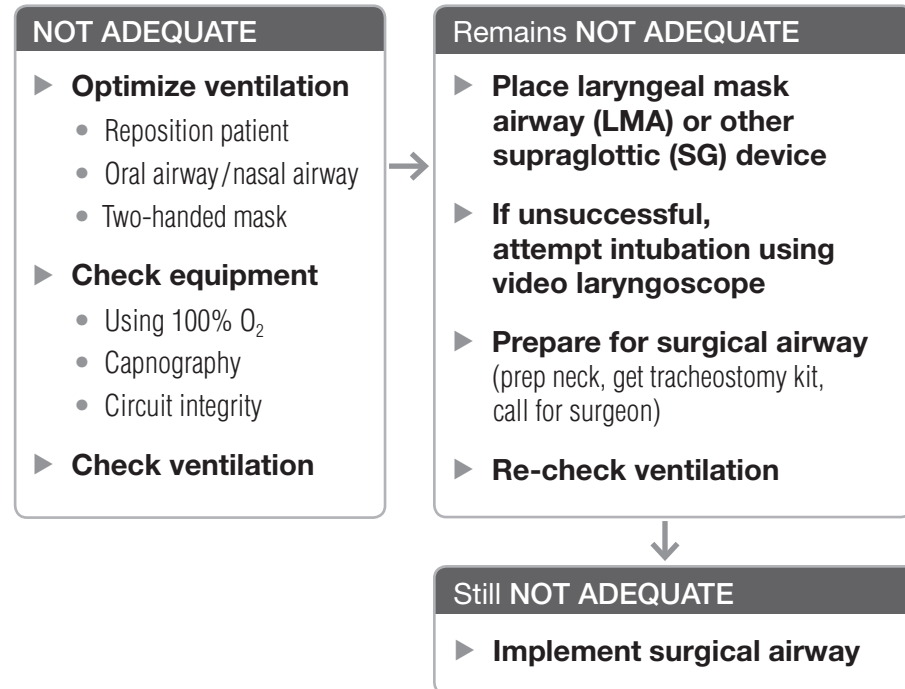
6 Failed Airway

2 unsuccessful intubation attempts by an airway expert

START

- 1 **Call for expert anesthesiology help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Get Difficult Airway Cart and a video laryngoscope**
- 3 **Bag-mask ventilate with 100% oxygen**
- 4 **Is ventilation adequate?**

Ventilation **NOT ADEQUATE**



← Switch list if ventilation status changes →

Ventilation **ADEQUATE**

- ▶ **Consider awakening patient or alternative approaches to secure airway...**
 - Operation using LMA, face mask
 - Video laryngoscope
 - LMA as conduit to intubation
 - Return to spontaneous ventilation
 - Different blades
 - Intubating stylet
 - Fiberoptic intubation
 - Light wand
 - Retrograde intubation
 - Blind oral or nasal intubation
- ▶ **If awakening patient, consider:**
 - Awake intubation
 - Do procedure under regional/local
 - Cancel the case

7 Fire

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

START

- 1 **Call for help** and **activate fire alarm**
 - ▶ **Ask:** "Who will be the crisis manager?"
- 2 **Get fire extinguisher to have if needed**

If AIRWAY fire

- 3 **Attempt to extinguish fire**
 - ▶ Shut off medical gases
 - ▶ Disconnect ventilator
 - ▶ Remove endotracheal tube
 - ▶ Remove flammable material from airway
 - ▶ Pour saline into airway
- 4 **After fire extinguished**
 - ▶ Re-establish ventilation using self-inflating bag with room air
 - If unable to re-establish ventilation, go to ▶ CHKLST 6
 - Avoid N₂O and minimize FiO₂
 - ▶ Confirm no secondary fire
 - Check surgical field, drapes and towels
 - ▶ Assess airway for injury or foreign body
 - Assess ETT integrity (fragments may be left in airway)
 - Consider bronchoscopy
- 5 **Assess patient status** and **devise ongoing management plan**
- 6 **Save involved materials/devices** for review

If NON-AIRWAY fire

- 3 **Attempt to extinguish fire**
 - FIRST ATTEMPT**
 - ▶ Avoid N₂O and minimize FiO₂
 - ▶ Remove drapes/all flammable materials from patient
 - ▶ Extinguish burning materials with saline or saline-soaked gauze
 - DO NOT use**
 - Alcohol-based solutions
 - Any liquid on or in energized electrical equipment (Laser, ESU/Bovie, anesthesia machine, etc.)
 - ▶ If equipment fire, use fire extinguisher
- 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
- 4 **After fire extinguished**
 - ▶ Maintain airway
 - ▶ 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
- 5 **Assess patient status** and **devise ongoing management plan**
- 6 **Save involved materials/devices** for review

8 Hemorrhage

Acute massive bleeding

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Open IV fluids** and **assess for adequate IV access**
- 3 **Turn FiO₂ to 100%** and **turn down volatile anesthetics**
- 4 **Call blood bank**
 - ▶ Activate massive transfusion protocol
 - ▶ Assign 1 person as primary contact for blood bank
 - ▶ Order blood products (in addition to PRBCs)
 - 1 FFP : 1 PRBC
 - If indicated, 6 units of platelets
- 5 **Request rapid infuser** (or pressure bags)
- 6 **Discuss management plan** between surgical, anesthesiology, and nursing teams
- 7 **Call for surgery consultation**
- 8 **Keep patient warm**
- 9 **Send labs**

CBC, PT/PTT/INR, fibrinogen, lactate, arterial blood gas, potassium, and ionized calcium

- 10 **Consider...**
 - ▶ Electrolyte disturbances (hypocalcemia and hyperkalemia)
 - ▶ Uncrossmatched type O-neg blood if crossmatched blood not available
 - ▶ Damage control surgery (pack, close, resuscitate)
 - ▶ Special patient populations (see considerations below)

DRUG DOSES and treatments

HYPOCALCEMIA treatment

Give calcium to replace deficit (calcium chloride or calcium gluconate)

HYPERKALEMIA treatment

- | | |
|-----------------------------------|--|
| 1. Calcium gluconate | • 30 mg/kg IV |
| - or - | |
| Calcium chloride | • 10 mg/kg IV |
| <hr/> | |
| 2. Insulin | • 10 units regular IV with 1–2 amps D50W as needed |
| <hr/> | |
| 3. Sodium bicarbonate if pH < 7.2 | • 1–2 mEq/kg slow IV push |

SPECIAL PATIENT POPULATIONS

OBSTETRIC:

- Empirical administration of 1 pool of cryoprecipitate (10 cryo units)
- Check fibrinogen (goal is 200 mg/dL)

< 100 mg/dL	Order 2 more pools of cryoprecipitate
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100 – 200 mg/dL	Order 1 more pool of cryoprecipitate
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TRAUMA:

Give either...

- Antifibrinolytic tranexamic acid: 1000 mg IV over 10 minutes followed by 1000 mg over the next 8 hours
 - or –
- Aminocaproic acid: 4–5 g in 250 mL NS/RL IV over first hour followed by a continuing infusion of 1 g in 50 mL NS/RL IV per hour over 8 hours

NON-SURGICAL UNCONTROLLED BLEEDING despite massive transfusion of PRBC, FFP, platelets and cryo:

- Consider giving Recombinant Factor VIIa: 40 mcg/kg IV
 - Surgical bleeding must first be controlled
 - **use with CAUTION** in patients at risk for thrombosis
 - **DO NOT use** when PH is < 7.2

9 Hypotension

Unexplained drop in blood pressure refractory to initial treatment

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Check...**
 - ▶ Pulse
 - ▶ Blood pressure
 - ▶ Equipment
 - ▶ Heart rate
 - If BRADYCARDIA, *go to* ▷ CHKLST 3
 - ▶ Rhythm
 - If VF / VT, *go to* ▷ CHKLST 5
 - If PEA, *go to* ▷ CHKLST 4
- 3 **Run IV fluids wide open**
- 4 **Give vasopressors** and titrate to response
 - ▶ MILD hypotension:
Give ephedrine or phenylephrine
 - ▶ SIGNIFICANT / REFRACTORY hypotension:
Give epinephrine bolus, consider starting epinephrine infusion
- 5 **Turn FiO₂ to 100%** and **turn down volatile anesthetics**
- 6 **Inspect surgical field for bleeding**
 - If BLEEDING, *go to* ▷ CHKLST 8

- 7 **Consider actions...**
 - ▶ Place patient in Trendelenberg position
 - ▶ Obtain additional IV access
 - ▶ Place arterial line

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* ▷ CHKLST 2
- Recent drugs given
- Dose error
- Drugs used on the field (i.e., intravascular injection of local anesthetic drugs)
- Wrong drug

DRUG DOSES and treatments

Ephedrine:	5 – 25 mg IV, repeat as needed
Phenylephrine:	80 – 200 mcg IV, repeat as needed
Epinephrine:	BOLUS: 4 – 8 mcg IV (dilute 1 mg in 250 mL = 4 mcg/mL)
	INFUSION: 0.1 – 1 mcg/kg/min IV

Breathing

- Increased PEEP
- Hypoventilation
- Hypoxia *go to* ▷ CHKLST 10
- Persistent hyperventilation
- Pneumothorax
- Pulmonary edema

Circulation

- Air embolism *go to* ▷ CHKLST 1
- Bradycardia *go to* ▷ CHKLST 3
- Malignant hyperthermia *go to* ▷ CHKLST 11
- Tachycardia *go to* ▷ CHKLST 12
- Bone cementing (methylmethacrylate effect)
- Myocardial ischemia
- Emboli (pulmonary, fat, septic, amniotic, CO₂)
- Severe sepsis
- Tamponade

10 Hypoxia

Unexplained oxygen desaturation

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis 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
- 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 issue...**
 - ▶ Draw blood gas
 - ▶ Suction (to clear secretions, mucus plug)
 - ▶ Remove circuit and use ambu-bag
 - ▶ Bronchoscopy

7 Consider causes...

- ▶ Is Airway / Breathing issue suspected?

NO airway issue suspected

Circulation

- Embolism
 - Pulmonary embolus
 - Air embolism – Venous *go to* ▷ CHKLST 1
 - Other emboli (fat, septic, CO₂, amniotic fluid)
- Heart disease
 - Congestive heart failure
 - Coronary heart disease
 - Myocardial ischemia
 - Cardiac tamponade
 - Congenital/anatomical defect
- Severe sepsis
- If hypoxia associated with hypotension, *go to* ▷ CHKLST 9

Drugs / Allergy

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

YES airway issue suspected

Airway / Breathing

- Aspiration
- Atelectasis
- Bronchospasm
- Hypoventilation
- Laryngospasm
- Obesity/positioning
- Pneumothorax
- Pulmonary edema
- Right mainstem intubation
- Ventilator settings, leading to auto-peep

Additional DIAGNOSTIC TESTS

- Fiberoptic bronchoscope
- Chest xray
- Electrocardiogram
- Transesophageal echocardiogram

11 Malignant Hyperthermia

In presence of triggering agent: unexpected, unexplained increase in end-tidal CO₂, unexplained tachycardia/tachypnea, prolonged masseter muscle spasm after succinylcholine. Hyperthermia is a late sign.

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** "Who will be the crisis manager?"
- 2 **Get Malignant Hyperthermia Kit**
- 3 **Call MH Hotline 1.800.644.9737**
- 4 **Assign dedicated person to start mixing dantrolene**
- 5 **Request chilled IV saline**
- 6 **Turn off volatile anesthetics and transition to non-triggering anesthetics**
 - **DO NOT** delay treatment to change circuit or CO₂ absorber
- 7 **Turn FiO₂ to 100%**
- 8 **Hyperventilate patient** at flows of 10 L/min or more
- 9 **Terminate procedure**, if possible
- 10 **Give dantrolene**
- 11 **Give bicarbonate** for suspected metabolic acidosis (maintain pH >7.2)
- 12 **Treat hyperkalemia**, if suspected
- 13 **Treat dysrhythmias**, if present
 - Standard antiarrhythmics are acceptable; **DO NOT use** calcium channel blockers
- 14 **Send labs**
 - Arterial blood gas
 - Electrolytes
 - Serum creatine kinase (CK)
 - Serum/urine myoglobin
 - Coagulation profile
- 15 **Initiate supportive care**
 - ▶ Consider cooling patient if temperature > 38.5°C:
 - **STOP** cooling if temperature < 38°C
 - Lavage open body cavities
 - Nasogastric lavage with cold water
 - Apply ice externally
 - Infuse cold saline intravenously
 - ▶ Place Foley catheter, monitor urine output
 - ▶ Call ICU

DRUG DOSES and treatments

Dantrolene	<ul style="list-style-type: none"> • 2.5 mg/kg, repeat up to 10 mg/kg until symptoms subside • Rarely, may require up to 30 mg/kg
Ryanodex®	<ul style="list-style-type: none"> • Reconstitute 250 mg vials with 5 cc sterile water each (shake until orange/opaque) • 2.5 mg/kg = 0.05 mL/kg • 70 kg patient dose = 3.5 mL
Dantrium® or Revonto®	<ul style="list-style-type: none"> • Reconstitute 20 mg vials with 60 cc sterile water each • 2.5 mg/kg = 7.5 mL/kg • 70 kg patient dose = 525 mL

Bicarbonate	<ul style="list-style-type: none"> • 1 – 2 mEq/kg, slow IV push (for suspected metabolic acidosis)
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HYPERKALEMIA treatment

Calcium gluconate	<ul style="list-style-type: none"> • 30 mg/kg
- or -	
Calcium chloride	<ul style="list-style-type: none"> • 10 mg/kg IV
Insulin	<ul style="list-style-type: none"> • 10 units regular IV • 1 – 2 amps D50W

TRIGGERING AGENTS

- Inhalational anesthetics
- Succinylcholine

DIFFERENTIAL diagnosis (consider when using high doses of dantrolene without resolution of symptoms)

Cardiorespiratory	Iatrogenic	Neurologic	Toxicology
<ul style="list-style-type: none"> • Hypoventilation • Sepsis 	<ul style="list-style-type: none"> • Exogenous CO₂ source (e.g., laparoscopy) • Overwarming • Neuroleptic Malignant Syndrome 	<ul style="list-style-type: none"> • Meningitis • Intracranial bleed • Hypoxic encephalopathy • Traumatic brain injury 	<ul style="list-style-type: none"> • Radiologic contrast neurotoxicity • Anticholinergic syndrome • Cocaine, amphetamine, salicylate toxicity • Alcohol withdrawal
Endocrine			
<ul style="list-style-type: none"> • Thyrotoxicosis • Pheochromocytoma 			

12 Tachycardia – Unstable

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

START

- 1 **Call for help and a code cart**
 - ▶ **Ask:** “Who will be the crisis manager?”
- 2 **Turn FiO₂ to 100%** and **turn down volatile anesthetics**
- 3 **Analyze rhythm**
 - If wide complex, irregular: treat as VF, *go to* ▷ CHKLST 5
 - Otherwise: prepare for cardioversion
- 4 **Prepare for immediate synchronized cardioversion**
 1. Sedate all conscious patients unless deteriorating rapidly
 2. Turn monitor/defibrillator ON, set to defibrillator mode
 3. Place electrodes on chest
 4. Engage synchronization mode
 5. Look for mark/spike on the R-wave indicating synchronization mode
 6. Adjust if necessary until SYNC markers seen with each R-wave
- 5 **Cardiovert at appropriate energy level**
 1. Determine appropriate energy level using Biphasic Cardioversion table at right; begin with lowest energy level and progress as needed
 2. Select energy level
 3. Press charge button
 4. Press and hold shock button
 5. Check monitor; if tachycardia persists, increase energy level
 6. Engage synchronization mode after delivery of each shock
- 6 **Consider expert consultation**

BIPHASIC CARディオVERSION energy levels

CONDITION	ENERGY LEVEL (progression)
Narrow complex, regular	50 J → 100 J → 150 J → 200 J
Narrow complex, irregular	120 J → 150 J → 200 J
Wide complex, regular	100 J → 150 J → 200 J
Wide complex, irregular	Treat as VF: <i>go to</i> ▷ CHKLST 5

Critical CHANGES

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

Defibrillation doses:

Biphasic: Follow manufacturer recommendation; if unknown use highest setting

Monophasic: 360J

If **cardiac arrest**, go to:

▷ CHKLST 5 Cardiac Arrest – VF/VT

▷ CHKLST 4 Cardiac Arrest – Asystole/PEA

During RESUSCITATION

Airway: Assess and secure

Circulation:

- Confirm adequate IV or IO access
- Consider IV fluids wide open