Supplemental Digital Content 1: Complete list of scenarios and their five critical key messages.

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| Scenario for residents of anesthesiology and intensive care |
|  First year of residency:  |
| Scenarios | Critical key messages |
| Moderate pneumothorax occurring during an intra-hospital transport of an intubated and ventilated patient. | 1. Recognize the real desaturation2. Ventilate at 100% oxygen3. Check the whole ventilation circuit4. Diagnose the pneumothorax (auscultation, percussion)5. No invasive procedure if hemodynamic and oxygenation is preserved |
| Accidental extubation occurring during an intra-hospital transport of an intubated and ventilated patient. | 1. Ventilate manually with a self-inflating bag at 100% oxygen 2. Try to intubate the patient3. Do not insist to intubate if ventilation is preserved4. Come back to the ICU as soon as possible5. Call for help to prepare for difficult intubation in the ICU |
| Tension pneumothorax with hemodynamic instability occurring during an intra-hospital transport of an intubated and ventilated poly-traumatic patient.  | 1. Diagnose the unilateral tension pneumothorax2. Ventilate at 100% oxygen3. Needle aspiration of pneumothorax with a catheter 4. Keep the catheter in the pleura 5. Call for help in the ICU to prepare for pleural drainage |
| Endotracheal tube mucus obstruction occurring during an intra-hospital transport of an intubated and ventilated patient. | 1. Ventilate 2. Recognize the endotracheal tube obstruction3. Extubate the patient4. Ventilate the patient5. Call for help to re-intubate the patient |
|  Second year of residency: |
| Scenarios | Critical key messages |
| Young female admitted to the emergency department with septic shock and obstructive acute pyelonephritis. | 1. Administer fluid loading with crystalloid 2. Quickly administer IV norepinephrine 3. Recognize the obstructive acute pyelonephritis4. Start intravenous antibiotics5. Call for emergent urinary drainage procedure |
| Young male admitted to the intensive care unit with cardiogenic shock caused by acute and severe myocarditis complicated with a paroxystic atrial fibrillation. | 1. Perform an echocardiography to confirm cardiogenic shock2. Monitor cardiac output to follow efficiency of treatments3. Administer IV inotropes to correct the cardiogenic shock4. Treat immediately the aggravating factors (such as abnormal rhythm to be shocked) 5. Quickly discuss the need for extracorporeal circulatory assistance  |
| Anaphylactic shock occurring in the operating room after antibiotic prophylaxis for emergent ectopic pregnancy. | 1. Stop all potential causal agents2. Administer fluid loading with crystalloid 3. Titrate with IV epinephrine boluses4. If refractory to epinephrine, administer IV norepinephrine5. Draw blood sample to attest the anaphylaxis (Histamine-tryptase-specific IgE)  |
| Cardiac arrest caused by acute massive pulmonary thromboembolism occurring in the medical hospitalization unit after standing up following 3 days of bed rest. | 1. Recognize cardiac arrest and initiation of cardiopulmonary resuscitation2. Consider of the massive pulmonary thromboembolism etiology with the anamnesis3. Perform an echocardiography to confirm the diagnosis 4. Administer fibrinolytic agent if no contraindication5. Administer symptomatic treatment of massive pulmonary embolism (catecholamine, protective ventilation…) |
|  Third year of residency: |
| Scenarios | Critical key messages |
| Cardiac arrest caused by cardiac tamponade on hemopericardium occurring in the surgical hospitalization unit 4 days after cardiac surgery. | 1. Treat asystole (CPR and epinephrine bolus)2. Administer a electric shock on the ventricular fibrillation 3. Perform trans-thoracic echography to help diagnose the etiology of cardiac arrest4. Confirm the cardiac tamponade on the echography5. Perform immediate percutaneous pericardiocentesis |
| Local anesthetic toxicity with convulsion and cardiac arrest occurring in an adult elective patient during orthopedic surgery.  | 1. Administer immediate seizure treatments (IV benzodiazepine)2. If respiratory arrest: ventilation and intubation3. Administer IV bolus of intralipid 20%4. If cardiac arrest: IV bolus of small doses of epinephrine (+/- norepinephrine) 5. Prepare for long cardiopulmonary resuscitation  |
| Peripartum hemorrhage with hemorrhagic shock during vaginal delivery with epidural. | 1. Diagnose the hemorrhage (>500ml)2. Treat the cause of uterine atony (oxytocin, uterine massage, urinary retention)3. Quickly administer IV sulprostone if atony remains despite oxytocin4. Administer blood products (red blood cells and frozen plasma) and correct coagulopathy5. Quickly consider surgical / embolization techniques  |
| Malignant hyperthermia occurring in the operating room. | 1. Recognize the malignant hyperthermia2. Stop the cause (halogenated…)3. Ventilate at 100% oxygen of exterior circuit4. Administer IV dantrolene5. Transfer the patient to the ICU |
| Sudden atrial fibrillation with hemodynamic instability occurring in a cardiac patient admitted to the ICU with septic shock and acute pneumoniae | 1. Plan the inital care strategy at the admission of the this critical patient 2. Diagnose the sudden atrial fibrillation with hemodynamic instability3. Administer appropriate sedation 4. Administer a synchronous electrical shock5. Control the factor favoring atrial fibrillation |
| Incidental curarization occurring after an error of syringe label in the operation room for an elective patient scheduled for inguinal hernia repair with spinal anesthesia.  | 1. Treat actively intraoperative hypotension2. Recognize apnea and ventilate the patient3. Search the etiology of the sudden apnea and unresponsiveness4. Consider error of syringe label, throw away all suspected syringes5. Administer sedative and inform the surgeon |
| Fourth year of residency: |
| Scenarios | Critical key messages |
| Patient with acute epiglottitis and asphyxia with a cannot intubate cannot ventilate situation. | 1. Recognize the obstructive respiratory failure 2. Approach the trolley for difficult intubation 3. Follow the difficult oxygenation algorithm4. Call for help5. Perform a cricothyrotomy |
| Patient with an emergent cesarean delivery and a cannot intubate but can ventilate situation. | 1. Check with surgeon if time remains to do a spinal anesthesia2. Approach the difficult intubation trolley 3. Pre-oxygenate for FeO2 >90%4. Rapid sequence intubation with succinylcholine5. If difficult intubation, do not insist to intubate and ventilate with a laryngeal mask |
| Patient with unstable C1 fracture surgery, and a need for intubation fiberscope procedure.  | 1. Keep head still in the spinal axis during all the procedure 2. Keep spontaneous ventilation and oxygenation during all the intubation procedure 3. Perform appropriate local anesthesia of superior airway track4. Associate conscious sedation5. Use short acting, quick-release sedation  |
| Infant with a severe laryngospasm occurring during awakening after elective testicular surgery. | 1. Recognize the laryngospasm as the cause of the desaturation2. Ventilate manually with an inflating bag at 100% oxygen3. Check and free upper airway track obstruction (mucus)4. Ventilate with an appropriate continuous positive airway pressure5. If needed, administer small doses of IV propofol |
| Fifth year of residency: |
| Scenarios | Critical key messages |
| Parturient with a sudden cardiac arrest caused by paroxystic amniotic embolism, associated with coagulation disorder and hemorrhage.  | 1. Start cardiopulmonary resuscitation immediately2. Intubate and oxygenate the patient with 100% oxygen3. Quick fetal extraction4. Treat coagulopathy5. Insert central line and arterial line to administer and monitor for catecholamine |
| Infant with hemorrhage on an IV line leak hidden under the surgical drapes.  | 1. Recognize hypovolemia2. Administer intravenous fluid boluses3. Check with the surgical team for surgical etiology 4. Check for an anesthesia etiology of hemorrhage5. Call for help to find the cause |
| Patient with a defibrillator perturbation occurring with the surgical electrocoagulation during an emergent cervical surgery for cellulitis.  | 1. Check for critical distance between electrocoagulation and the defibrillator (15 cm)2. The electrocoagulation may inhibit the pacemaker3. The magnet will reprogram the pacemaker mode into asynchroneous 4. The magnet will have no effect on the pacemaker of a defibrillator5. A rythmologist must reprogram the defibrillator before the surgery |
| Cardiopulmonary arrest caused by a sudden ventricular fibrillation occurring in the post-anesthesia care unit. | 1. Start cardiopulmonary resuscitation2. Call for help3. Defibrillate4. Switch performers for chest compressions every 2 minutes5. Administer intravenous bolus of 1 mg of epinephrine + 300 mg of amiodarone after the 3rd shock |
| Scenario for residents of pediatric intensive care |
| Scenarios | Critical key messages |
| A pediatric septic shock with purpuric meningitis arriving in the emergency department. | 1. Diagnose the septic shock2. Insert an intravenous line (or intra osseous if needed)3. Administer intravenous fluid boluses4. Draw blood samples for blood culture5. Start intravenous antibiotics as soon as possible |
| Infant with seizure and loss of consciousness in a shaken baby syndrome admitted to the emergency department  | 1. Recognize the criteria for the severity of the seizure 2. Call for help3. Immediate seizure treatments with correct oxygenation of the infant4. Immediate bedside measurements (temperature, dextro and point of care hemoglobin) 5. Call for cerebral CT scan immediately |
| Infant with hypovolemic shock with acute gastroenteritis in the emergency department.  | 1. Recognize the signs of shock in the infant 2. Diagnose the hypovolemic shock3. Insert an IV catheter (or intra osseous if needed)4. Administer intravenous fluid boluses5. Evaluate the effectiveness of the fluid bolus and re-administer in needed  |
| Neonate intubated and ventilated for post-operative admission in the intensive care unit and desaturation caused by selective intubation.  | 1. Auscultation and observation of EtCO22. Ventilate with a self-inflating bag at 100% oxygen 3. Check ventilator and the endotracheal tube position 4. Suction in the endotracheal tube5. Prepare for technical procedure (laryngoscopy…) |
| Infant with cardiogenic shock and supra ventricular tachycardia admitted to the intensive care unit. | 1. Recognize clinical cardiogenic shock2. Consider the etiology of the cardiogenic shock 3. Analyze cardiac rhythm and diagnose paroxysmal supraventricular tachycardia4. Call for help5. Immediate treatment of paroxysmal supraventricular tachycardia (vagal maneuvers, medications, electric shock) |