

Implementing the ABCD's During a Code Blue Response
in an Adult Patient
Self - Instructional Module

Objectives

1. List the components of SBAR
2. Recognize the process for initiating a Rapid Response
3. Describe the process for initiating a Code Blue Response
4. Define the responders responsibilities during a code blue
5. Identify ACLS medications that may be utilized during a code blue
6. Indicate the equipment that may be utilized during a code blue
7. Explain documentation guidelines during and after a code blue
8. Describe end of code blue care
9. Discuss post resuscitation care
10. Participate in crash cart review session
11. Interpret 6 basic EKG rhythms

Purpose

This self learning module is designed for the purpose of increasing nurses understanding of Code Blue Response by outlining accountabilities and practices related to staff, equipment, and processes pertaining to Code Blue issues.

Scope

Registered Nurses and Licensed Practical Nurses.

Activity

This educational activity has multiple components:

- Self Instructional module with written exam
- Crash Cart and monitor/defibrillator review session offered on each unit and validated by the unit educator. Completion of this component includes:
 - Participation in crash cart review
 - Demonstrate use of Likepak monitor/defibrillator
 - Demonstration of telemetry application
 - EKG rhythm identification written exam and evaluation

Thank you

SBAR

SBAR is a situational briefing tool that logically organizes information so it can be transferred to others in an accurate and efficient manner. SBAR fosters critical thinking and eliminates information from getting lost in translation.

- S – Situation (why are you calling)
- B – Background (why is the patient in the hospital)
- A – Assessment (your impression of the situation)
- R – Recommendation (suggestions you may have)

Initiating a Rapid Response

Rapid Response is a dedicated group of individuals that responds to emergency situations within the hospital in order to try to decrease mortality and morbidity on our patients.

The Rapid Responders:

- Intervene in a potential code/emergency situation
- Rely on bedside nurses who are highly sensitive to signs that a patient's condition is deteriorating, and empowered to call others to action.

Notification Criteria

- Respiratory Rate >10 or <24
- Wet lungs
- Shortness of breath
- Respiratory distress
- Heart rate persistently > 120
- Heart rate <40
- Arrhythmia – Priority 1 & 2 alarms (described in Housewide Telemetry protocol)
- Systolic Blood Pressure <90 mmHg
- Mean Arterial Pressure (MAP) < 60 mmHg
- Chest Pain
- Mental Status Change
- Anxiety/Agitation
- Seizures
- Urine Output <30ml/hr X 2 hours

Activation of Rapid Response

- Staff indicates criteria to activate Rapid Response
- Staff calls “3333” (operator) and states, “Rapid Response needed in room number ____”
- Operator activates code pagers with message “1111 – *Patient's room number*”
- Assigned Rapid Responders will report to patient room

Who are the Rapid Responders?

- Registered Nurse (Critical Care Services staff nurse, Clinical Nurse Manager or Charge Nurse, Nursing Supervisor)
- Respiratory Therapist
- Designated Intern

Roles and Responsibilities

- Rapid Response Registered Nurse
 - Arrive with tool kit
 - Function as a team leader in the absence of physician
 - Remain at bedside until patient is stabilized or transferred to appropriate level of care
 - Follow up visits 4 hours after the call for all patients not transferred to the ICU/CCU or 2C/N
 - Document on Rapid Response documentation form
- Respiratory Therapist
 - Arrive with tool kit
 - Function as part of the team regarding respiratory issues
- Intern
 - Team leader
- Bedside Nurse
 - Obtain manual vital signs
 - Print labs
 - Glucometer at bedside
 - Provide current situation/medical background of patient
 - Remain at bedside to care for patient
- Unit Secretary
 - Dial “3333” and state, “Rapid Response needed in room number ____”
 - Print Rapid Response Progress note

Rapid Response is not used in Lieu of:

- Code blue procedure for cardiopulmonary arrest
- Formal or informal critical care consult when indicated
- Perform routine admission, discharge, transfer, transport functions or IV start

Exclusions to the Program

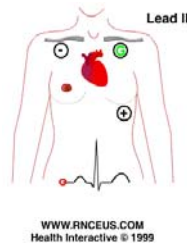
- Emergency Department
- ICU/CCU
- Operating Room
- PACU
- OB/Nursery with the exception of Post-Partum

Initiating a Code Blue

Code Blue refers to a patient in cardiac arrest, respiratory arrest, or any emergency situation that require resuscitation and intervention. Patient survival and positive outcomes depend on rapid assessment of the situation and initiation of basic and advanced life support measures.

The first person to recognize that a patient has arrested should:

- Call for help from team members
- Dial 3333 and state “code blue on _____ (nursing unit)” or delegate someone to call a code. The code will be announced overhead and a message will be sent to all designated pagers.
- Begin CPR immediately
- Staff members will assist by:
 - Obtaining crash cart/defibrillator and immediately bring to the patient’s bedside
 - Place backboard under the patient as soon as possible to provide a hard, level surface for chest compressions thus will increase cardiac output
 - Retrieve ambu bag, which is located in the RED box on bottom of the crash cart and provide ventilations
 - Apply electrodes and lead wires to patients chest as follows:
 - RA electrode (white) is applied to the right shoulder close to the junction of the right arm and torso.
 - LA electrode (black) is applied to the left shoulder close to the junction of the left arm and torso.
 - LL electrode (red) is applied below the heart in the abdominal region.



- Monitor patient and EKG tracing
- Placement of #18 or #20 gauge IV catheter may be necessary. If a central line is required, the kit is located in the 3rd drawer of the crash cart. Barrier devices are located in the supply pyxis and/or drawer 3 of the crash cart: sterile towels and gloves face shields, gowns, and cap.

Responders

Director of the Code: All house staff that is near the site of the Code Blue shall respond. Physician staff may be dismissed from the Code Blue scene after the “physician in charge” is determined. The physician in charge *must be clearly identified* as being in charge. Responsibilities include:

- Direct all activities of the resuscitation effort
- Delegate or directly participate in airway management, vascular access, medication orders, and maintaining Advanced Cardiac Life Support (ACLS) interventions

Recording Nurse: The nurse assigned to the patient should be the person that documents all the events of the code for reasons of continuity in documentation and ability to provide information regarding the patients hospitalization, current treatments, medications and the events that occurred immediately before the code.

The recording nurse is responsible for:

- Ensuring the patient chart is brought to the room when the code is called
- Utilizing the Resuscitation Record to document events of the resuscitation effort, and assists with utilization of the Crash Cart including medication and IV preparation
- Place the *completed* Resuscitation Record in the chart. Progress notes should indicate patient condition prior to resuscitation “code call”. If necessary a “late entry” describing patient condition prior to the resuscitation event should be recorded. A notation must be made in the progress notes referring to the Resuscitation Record for events of the resuscitation
- Ensuring the family and physician has been contacted
- Transport patient to Critical Care Unit

Medication Nurse: This “hands on” nurse is responsible for:

- Initiating BLS-HCP measures according to American Heart Association (AHA) standards
- Provide ACLS measures
 - Initiate cardiac monitoring
 - Locate/apply quick-comb redi-pak that can be utilized for defibrillation, cardioversion, transcutaneous pacing, and viewing the cardiac rhythm.
 - Assess for patent IV and/or assist with the initiation of IV route
 - Prepare, label and administer medications per physician order
 - Assemble equipment for intubation and suctioning

Respiratory Therapist: Three respiratory care staff is assigned each shift to respond to Code Blue. Respiratory Therapists responsibilities include:

- Perform BLS-HCP according to AHA standards
- Maintain airway by suctioning and manual ventilation before intubation
- Assist physician with intubation and securing endotracheal tube (ETT)
- Obtaining blood sample for arterial blood gas analysis

- Set up oxygen and ventilation equipment
- Assist with transport to critical care unit
- Ensure proper paperwork is completed for the Respiratory Care Department

Anesthesiologist: If the physician is unable to intubate the patient, the operator may page an anesthesiologist (call 3375 to confirm an anesthesiologist was contacted) to intubate the patient, ensure an adequate airway and to facilitate ventilation.

Unit Secretary: The unit secretary must remain at the nurse's station to contact the appropriate personnel upon request, place orders in the computer, and answer the telephone.

Charge Nurse/Nursing Supervisor: The supervising nurse acts as a resource facilitator for the code team. The resource facilitator is responsible for:

- Communicating with personnel regarding equipment and ancillary service needs.
- Coordination of the initial resuscitation effort, assisting the recording and medication nurse
- Checking on and removing any other patients or visitors in the room as necessary
- Making space for the resuscitation effort
- Clearing unnecessary staff from the room
 - Those who are not listed as team members and who are not actively participating in the resuscitation effort.
- Coordinating the transfer effort by contacting Registrar and/or ICU/CCU to facilitate transfer of the patient after resuscitation.
- Directing actions of the "runner".
- Monitoring of the continued care of other patients
- Notifying the attending physician, and patient's family.
- Assisting with evaluation of the resuscitation effort.

Nurse Assistant: One nurse assistant could be delegated to remain outside of the room to assume the role of "runner". The responsibilities may include:

- Running errands
- Obtaining supplies/equipment
- Transferring patients to another area.

The remaining nurse assistants will remain on their assigned unit. When the NA is utilized as a runner, provide specific instructions regarding *what* is wanted, *where* it is located and how *quickly* you want it.



ACLS Medication Summary

Medications administered during a code depend on the cause of arrest, cardiac rhythm and patient's response. The goal of treatment with medications is to reestablish and maintain cardiac function, correct hypoxemia, and suppress cardiac ectopics

Most Frequently Used Code Drugs		
Drug	Indication	Adult Dosage
Amiodarone	Ventricular Fibrillation (VF) Pulseless Ventricular Tachycardia (VT) Ventricular Tachycardia (VT) <i>Amiodarone IVPB is obtained in Pharmacy</i>	<ul style="list-style-type: none"> • <i>Cardiac Arrest:</i> 300mg IV in 3-5 minutes (dilute to 20-30ml D5W). Consider repeating 150mg IV in 3-5 minutes. Max cumulative dose: 2.2g IV/24 hours. • <i>Wide Complex Tachycardia (stable):</i> <ul style="list-style-type: none"> • 150mg (diluted) rapid IV over first 10 minutes (15mg/min) • May repeat rapid 150mg dose every 10 minutes as needed • Slow infusion: 360 mg IV over 6 hours (1mg/min) • Maintenance infusion: 540mg IV over 18 hours (0.5mg/min)
Atropine	Bradycardia Asystole Pulseless electrical activity (PEA)	<ul style="list-style-type: none"> • <i>Asystole or PEA:</i> 1mg IV. Repeat every 3-5 minutes. Max total dose: 3 doses (3mg) • <i>Bradycardia:</i> 0.5 mg IV every 3-5 minutes as needed., max 0.04mg/kg • ETT: 2-3mg diluted in 10ml normal saline
Epinephrine	Ventricular Fibrillation (VF) Pulseless VT Asystole Pulseless Electrical Activity (PEA)	<ul style="list-style-type: none"> • 1mg (10ml of 1:10,000 solution) IV every 3-5 minutes. Follow each dose with 20ml N.S. IV • ETT: 2-3mg diluted in 10cc N.S.

More Code Drugs

Drug	Indication	Adult Dosage
Adenosine	Narrow Complex Paroxysmal Supraventricular Tachycardia (PSVT)	<p>With patient in reverse Trendelenburg position:</p> <ul style="list-style-type: none"> Initial bolus of 6mg rapidly over 1-3 seconds, followed by 20ml normal saline, then elevate the extremity Repeat dose of 12mg in 1-2 minutes if needed A third dose of 12mg may be given in 1-2 minutes if needed
Calcium Chloride	Known or suspected hypercalcemia; hypocalcemia; antidote for calcium channel blocker or B-adrenergic blocker overdose; Prophylactically before IV calcium channel blockers to prevent hypotension	<ul style="list-style-type: none"> <i>Hyperkalemia, calcium channel blocker overdose, or IV prophylaxis before calcium channel blocker:</i> Slow IV push of 500-1000 mg/kg (5-10ml of a 10% solution).
Dopamine	Symptomatic Bradycardia (after atropine) Hypotension(SBP \leq 70-100 mmHg)with s/s shock	<i>See IV Drips section below</i>
Levophed	Hypotension SBP <70 with S/S shock	<i>See IV Drips section below</i>
Lidocaine	Ventricular Fibrillation (VF) Pulseless electrical Activity (PEA) Stable Ventricular Tachycardia (VT)	<ul style="list-style-type: none"> <i>Cardiac Arrest from VF/VT:</i> Initial dose: 1-1.5mg/kg IV. For refractory VF may give additional 0.5-0.75mg/kg IV, repeat in 5-10 minutes (max dose of 3mg/kg). Single dose of 1.5mg/kg IV ETT: 2-4mg/kg (<i>Also see IV Drips</i>)
Magnesium Sulfate	For use in cardiac arrest only if Torsades De Pointes or suspected hypomagnesemia is present	<ul style="list-style-type: none"> <i>Cardiac arrest for torsades de pointes or hypomagnesemia:</i> 1-2g (2-4ml of 50% solution) diluted in 10ml of D5W IV over 5 – 20 min. <i>Non-cardiac arrest with Torsade de pointes:</i> Loading dose of 1-2g mixed in 50-100ml of D5W over 5-60 minutes. Follow with 0.5-1g/h IV (titrate to control the torsades)
Nitroglycerin	Suspected ischemic pain or MI	<ul style="list-style-type: none"> <i>IV infusion:</i> 10-20mcg/min. Increase by 5 – 10 mcg/min every 5 – 10 minutes until desired response. <i>Onset of actions 1-2 minutes</i> <i>Sublingual:</i> 1 tablet (0.3-0.4mg) x3 at 5 minute intervals(<i>Also see IV Drips</i>)
Oxygen	Suspected ischemic chest pain	4 lpm per nc for uncomplicated MI; 100% oxygen during resuscitation

Drug	Indication	Adult Dosage
Procainamide	VF, Pulseless VT, may use for treatment of PSVT uncontrolled by adenosine/vagal maneuvers if BP is stable, stable wide complex tachycardia of unknown origin, atrial fibrillation with rapid rate in WPW syndrome	<ul style="list-style-type: none"> • <i>Recurrent VF/VT: 20mg/min IV infusion (max total dose: 17mg/kg). Also see IV Drips section</i>
Vasopressin	VF, pulseless VT	40 units IV single dose. <i>May be used as an alternative pressor to epinephrine for the 1st or 2nd dose. Epinephrine may be administer 10 minutes after vasopressin</i>
Verapamil	Alternative drug (after adenosine) to terminate Paroxysmal Supraventricular Tachycardia (PSVT) May control ventricular response in patients with atrial fib, atrial flutter, and multip focal atrial tachycardia.	<i>IV infusion:</i> <ul style="list-style-type: none"> • <i>Initial: 2.5-5mg IV bolus over 2 minutes</i> • <i>Second dose: 5-10mg if needed in 15-30 minutes. Max dose:20 mg</i>

ACLS Medication IV Drips

Drug	Concentration/Indication	Adult Dosage
Dopamine (Intropin)	Mix as: 800mg dopamine in 250cc D5W Concentration: 3200mcg/ml Indications: <ul style="list-style-type: none"> • Hypotension that occurs with symptomatic bradycardia • Hypotension that occurs after return of spontaneous circulation • Cardiogenic shock. May be used in bradycardia to increase HR. 	<ul style="list-style-type: none"> • 2 – 20 mcg/kg/min and titrate to patients response.
Lidocaine (Xylocaine)	Mix as: 2 grams of Lidocaine in 500 cc D5W Concentration: 4mg/ml Indications: <ul style="list-style-type: none"> • Significant ventricular ectopy (runs of VT, R on T, frequent or multiform PVC's) seen in the setting of AMI or ischemia • VT/VF that persists after defibrillation and administration of epinephrine • VT with pulse • Wide complex tachycardia of uncertain origin 	<ul style="list-style-type: none"> • <i>Maintenance infusion: 1-4mg/min (20-50mcg/kg per minute)</i> <p style="text-align: center;"><u>Infusion rates:</u></p> <p style="text-align: center;">15cc/hr=60mg/hr=1mg/min 30cc/hr=120mg/hr=2mg/min 45cc/hr=180mg/hr=3mg/min 60cc/hr=240mg/hr=4mg/min</p>
Norepinephrine (Levophed)	Mix as: 8 mg Norepinephrine in 250cc D5W Concentration: 32mcg/ml Indications: <ul style="list-style-type: none"> • Treatment of profound hypotension unresponsive to volume loading & dopamine 	<ul style="list-style-type: none"> • <i>IV Infusion only: 0.5-1mcg/min titrated to improve BP up to 30mcg/min</i>

Procainamide	Mix as: 1 gram Procainamide in 250cc D5W Or 2 grams Procainamide in 500 cc D5W Concentration: 4mg/ml Indications: Treatment of ventricular arrhythmias	<ul style="list-style-type: none"> • <i>Recurrent VF/VT:</i> 20mg/min IV infusion (max total dose of 17mg/kg). • Administer at 20mg/min until one of the following occurs: Arrhythmia suppression Hypotension QRS widens by >50% Total dose of 17mg/kg is given • <i>Maintenance Infusion:</i> 1-4mg/min • <i>Renal or cardiac dysfunction:</i> Max total dose: 12 mg/kg. <p style="text-align: center;"><u>Infusion Rates:</u> 15cc/hr=60mg/hr=1mg/min</p>
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Tracheal Administration of Resuscitation Medications

Certain medications can be administered via the tracheal tube if unable to obtain intravenous access. Tracheal doses of medications should be 2 to 4 times higher than the intravenous route. Resuscitation medications that can be given via tracheal tube are the “**ALE**” drugs.

Medication	Tracheal Administration
A tropine	2 to 3 mg diluted in 10 ml normal saline
L idocaine	2 to 4 mg/kg
E pinephrine	2 to 2.5 mg diluted in 10ml normal saline

Recommended Technique for Tracheal Drug Administration

- Prepare medication according to tracheal administration guidelines
- Stop chest compressions and inject the medication via the ETT
- Flush the ETT with 10 ml of normal saline when indicated
- Immediately attach the ventilation bag to the tracheal tube and ventilate forcefully 3 to 4 times to circulate the drug



Equipment Used in Codes Crash Cart

All adult crash carts in the hospital contain the same basic emergency equipment and medications. To open the crash cart, turn the red plastic lock located on the bottom drawer until it breaks. Flip up the bottom panel of the crash cart and push it back firmly until it stops to be able to open the remaining drawers on the cart.

Summary of Crash Cart Contents/Location

- 1st drawer: 1st line drugs
- 2nd drawer: 2nd line drugs
- 3rd drawer: equipment, central line trays
- Bottom drawer: equipment, ambu bag & intubation box

What is **not** in the crash cart?

- No Narcotics
- No Sedatives
- No Paralytics

Location	Medication/Equipment	Quantity
<u>Top of Cart</u>	Monitor/Defibrillator	1
Equipment	Quik combo redi-pak	1
	Electrodes	1 Pouch
	Suction Machine/ Canister	1
	Clip board with Dr. Blue sheets and gray charge slips	1
<u>Back of Cart</u>	Cardiac Back Board	1
	Extension cord	1
	* Oxygen tank is located on the side of the cart	
<u>Drawer 1</u>		
1st line resuscitation drugs	• Lidocaine 2% 100mg/5ml	2
	• Atropine 1mg (0.1mg/ml)	3
	• Epinephrine 1:10,000 syringe	12
	1mg/10ml (0.1mg/ml)	
	• Procainamide 1 gm	1
	• Vasopressin 20 units/1 ml	2
	• Dopamine 800mg/250ml D5W	1
	• Adenosine (Adenocard) 6mg/2ml (3mg/ml)	5
	• Amiodarone 150mg/3ml (50mg/ml)	3
	• D5W 250ml	1
	• NaCl 0.9% Flush Syringes 10ml	20
	• Labels I.V.	2

<p style="text-align: center;"><u>Drawer 2</u></p> <p>2nd line emergency drugs</p>	<ul style="list-style-type: none"> • Calcium Chloride 10% 10ml • NaCl 0.9% 20 ml • Furosemide (Lasix) 40mg/4ml • Norepinephrine (Levophed) 4mg/4ml (in plastic bag with D5W 250ml to mix) • Verapamil (Calan) 5mg/2ml • Hydrocortisone (Solu-Cortef) 250mg/2ml • Romazicon 0.5mg/5ml • Narcan 0.4mg/ml • Epinephrine 1:1,000 (1mg/ml) • Benadryl 50mg/ml • Regitine 5mg • 50% Dextrose 25 grams • 8.4% Sodium Carbonate 50meq • Dilantin 250mg/5ml • Mag SO4 50% 2ml 	<p style="text-align: right;">2 20 2 2 4 1 1 2 1 1 1 2 1 4 4</p>
<p style="text-align: center;"><u>Drawer 3</u></p> <p>Vascular Access Equipment; pacemaker wire, multilumen catheter</p>	<p>Needles: 19 gauge 1 ½ inch 20 gauge 1 ½ inch</p> <p>Syringes: 60cc 60cc Cath Tip 20cc 10cc 5cc 3cc</p> <p>Salem sump #18 Alcohol sponges Topper sponges</p> <p>Tapes: Non-allergenic 1 inch Dermaclear 1 inch</p> <p>IV equipment:</p> <p>Tourniquets 1 inch Jelco 14 gauge 16 gauge 18 gauge 20 gauge 22 gauge Scalp vein set 19 gauge 21 gauge</p> <p>PRN adaptor Exam gloves Face mask with shield Disposable eye protector</p>	<p style="text-align: right;">6 8 2 1 4 6 4 8 1 8 4 2 1 2 2 2 2 4 2 1 1 6 6 3 1</p>

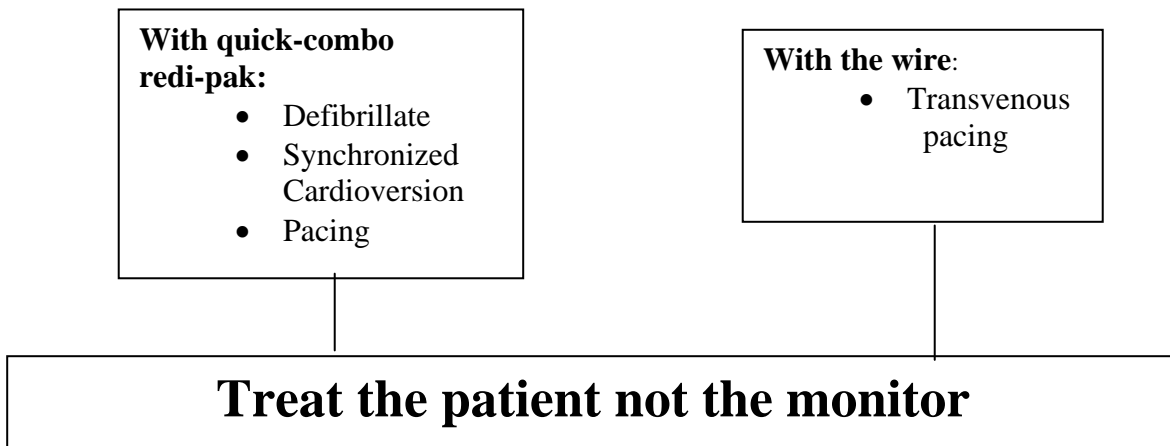
	#11 Scalpel with handle Temporary pacing kit 5 Fr. Multilumen Cath Pacemaker Kit includes: <ul style="list-style-type: none"> • Disposable pacing kit 6 Fr. • 8.5 Introducer cath Stop cock EKG monitor electrodes Vacutainer tubes (yellow, blue, gray, purple, red)	3 1 1 1 2 9 1 each
<u>Lower shelf</u> IV fluids & tubing/other equipment	Sterile gloves (6 1/2, 7, 7 1/2, 8) IV tubing (primary, secondary, extension) IV Fluids (0.9 N.S. 500cc & 1000cc) Lidocaine 2 Gms.500cc D5W Needle box Suction trays 14 Fr. Ambu respiratory bag: RED box Intubation tray: GRAY box	2 each 3 each 2 each 1 1 2 1 1

Medtronic Lifepak 20 Monitor/Defibrillator with Biphasic Technology

Delivers energy in 2 directions between the quick combo redi-pak pads

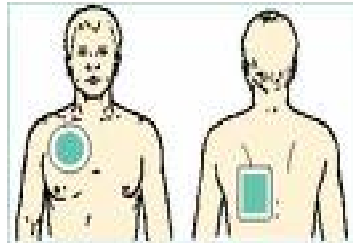
The monitor/defibrillator is located on top of the cart. The patient's cardiac rhythm can be monitored via the quick combo redi-pak or electrode and lead wires. The "lead" button or rotation of the speed dial is utilized to change the ECG lead ("Paddles refers to the quick combo redi-pak pads).

Electrical Intervention

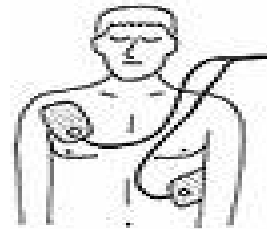


Defibrillation (AED or Manual)

Immediate defibrillation is the most effective therapy for the treatment of ventricular fibrillation and pulseless ventricular tachycardia. Defibrillation delivers an electrical current to the heart to completely depolarize the heart and the impulses that are causing the dysrhythmia are disrupted. The current can be delivered through the chest wall by use of the quick combo redi-pak connected to the defibrillator/monitor for AED or manual mode defibrillation. The Medtronic lifepak in the AED mode delivers joules of 200, 300, and 360 and can only be used in cardiac arrest (unconscious patient, pulseless and not spontaneously breathing). The joules can be changed when in the manual mode. Possible complications of defibrillation include burns and damage to the heart muscle.



Anterior/Posterior
Pad Placement



Anterio-Apical
Pad Placement

Special Considerations

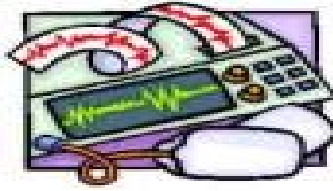
- **ICD/Pacemaker:** Avoid placing pads directly over the implanted device. Place at least 1 inch away from device.
- **Water:** Remove patient from free-standing water and dry the chest before defibrillation.
- **Topical medication patches/paste (i.e. nitroglycerine):** must be removed before defibrillation.

Synchronized Cardioversion

Cardioversion is similar to defibrillation, except that the delivery of energy is synchronized to occur during ventricular depolarization (QRS complex) to disrupt the rhythm, rather than depolarize the heart. Cardioversion can be performed with a lower energy level of 50 joules. Cardioversion would be utilized in an emergency situation to treat patients with ventricular tachycardia or atrial tachycardia who have a pulse but are symptomatic (hypotension, cool clammy skin and decreased level of consciousness). Elective cardioversion can also be utilized to treat atrial fibrillation and atrial flutter.

- The electrodes/lead wires and quick combo redi-pak must both be utilized for synchronized cardioversion
- Be sure to sedate the patient before cardioversion

Transcutaneous Cardiac Pacing



Transcutaneous cardiac pacing is a noninvasive treatment indicated for symptomatic bradycardia (HR <60), second and third degree heart blocks. Cardiac pacing stimulates the heart with externally applied cutaneous pads that deliver an electrical impulse that is conducted through the chest wall to stimulate the myocardium. The lifepak has the transcutaneous pacemaker option for either demand (synchronous) or non-demand (asynchronous) pacing modes.

- Demand mode: inhibits pacing when it senses the patients own beats.
- Non-demand mode: generates pacing impulses at the selected rate regardless of the patients EKG rhythm.

The electrodes/lead wires and quick combo redi-pak must both be utilized for pacing.

Advantages:

- Easy to initiate
- Fast to initiate
- Non-invasive

Disadvantages:

- May be uncomfortable for the patient

Considerations:

- Conscious patients may require analgesia for discomfort
- While pacing, avoid touching the gelled area of the quick combo redi-pak or patient to prevent electrical shock.
- Do not use pads for more than eight hours of continuous pacing
- The patient can be paced and defibrillated through the same set of pads

Transvenous Cardiac Pacing

The patient may require transvenous cardiac pacing which is a catheter that is inserted via venous access. The tip of the pacing catheter sits against the inner wall of the right atrium, right ventricle, or both the right atrium and right ventricle. The proximal end of the catheter is attached to the pulse generator. The venous access kit and pacemaker wire kit is located in the bottom drawer of the crash cart. The pacemaker generator is located in ICU/CCU or 2 Center. The settings on the generator are the same as transcutaneous pacing: (mA=output, rate, mode=demand or fixed).

Advantages:

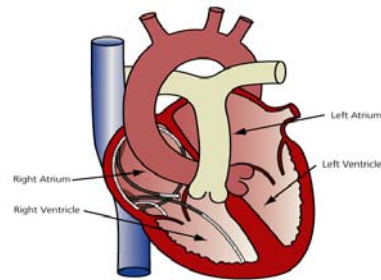
- The patient will tolerate better than transcutaneous pacing
- External/Non-invasive

Disadvantages:

- Takes longer to initiate than transcutaneous pacing
- Invasive

Transvenous Pacer Supplies:

- Central Line Kit: 3rd drawer
- Pacer wire: 3rd drawer
- Pulse generator (power supply for pacer wire): ICU/CCU or 2C



Recognition and Treatment of Dysrhythmias

Assessing the patient for hemodynamic compromising ECG changes are crucial in determining interventions and affect patient outcomes. In addition to monitoring the ECG rhythm, frequently assess the patients ABC's by:

- Initiate and maintain an adequate airway to ensure adequate breathing or ventilation
- Monitor blood pressure, pulse, respiratory rate, pulse oximetry (if pulse is present) and level of consciousness
- Monitor fluid and electrolytes (potassium, phosphorous, magnesium and calcium) because electrolyte abnormalities can result in dysrhythmias
- Treat the patient not the monitor

Normal Sinus Rhythm



Sinus rhythm is defined as a heart rate between 60 and 100 thus provides an adequate cardiac output and blood pressure

Interventions:

- Continue to monitor

Sinus Bradycardia



Assess for signs & symptoms of diminished perfusion with bradycardia (HR <60):
Chest pain, SOB, ↓ LOC, weakness, fatigue, dizziness, hypotension, and diaphoresis

Interventions:

- Check for pulse and blood pressure
- If patient is symptomatic the physician should see the patient immediately. Initiate appropriate emergency interventions.
- Determine cause and treat. Causes could include: ↑vagal stimulation, medications causing a negative chronotropic effect, hypoxia and ↑intracranial pressure
- Consider the need for atropine (1st drawer)
- Consider Transcutaneous Pacing

Sinus Tachycardia



Assess for signs & symptoms of diminished perfusion with tachycardia

(HR 100): Hypotension, syncope, blurred vision, chest pain, palpitations, anxiety, crackles, jugular vein distention, and S3

Interventions:

- Contact physician or call a code blue
- Consider the need for adenosine (1st drawer)
- Determine cause and treat
- There are numerous conditions that can cause sinus tachycardia and all should be considered during assessment, treatment and during response to treatment. Conditions that may cause sinus tachycardia include:
 - ♦ Cardiac dysrhythmia
 - ♦ Respiratory distress/Hypoxia
 - ♦ Metabolic disorder
 - ♦ Head injury/↑ICP
 - ♦ Emotions (anger, anxiety)
 - ♦ Medications/illicit drugs/poison
 - ♦ Pain
 - ♦ Acidosis
 - ♦ Compensatory (early shock)
 - ♦ Fever

Ventricular Tachycardia



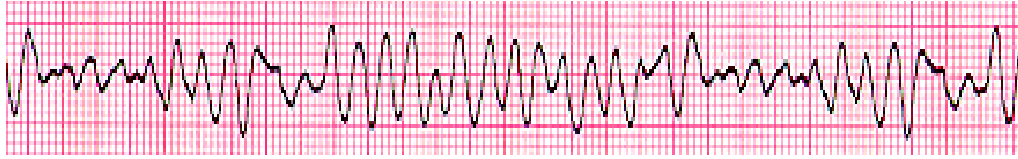
Description: Wide complex, fast and regular rhythm

Assess for signs and symptoms of diminished perfusion with VT: Hypotension, ↓ LOC leading to unresponsiveness, and SOB. Ventricular Tachycardia most often precedes cardiac arrest and the patient may be conscious or unconscious.

Interventions:

- Assess for pulse
- If the patient is stable (has a pulse) and does not have indications of diminished perfusion: administer medications
- If the patient is unstable with a pulse: cardiovert
- If the patient is unstable (pulseless): defibrillate

Ventricular Fibrillation



Description: Erratic electrical activity. No distinct rhythm

Signs and symptoms associated with ventricular fibrillation: The patient is in full cardiac arrest without a blood pressure or pulse.

Interventions:

- Treat for cardiac arrest
 - Initiate CPR according to AHA guidelines
 - Defibrillate: 200, 300, 360 joules
 - Consider administering
 - epinephrine or vasopressin (1st drawer)
 - lidocaine or amiodarone (1st drawer)

Asystole



Description: Absence of electrical activity “flat line”

Interventions:

- Check lead placement, assess for pulse
- Initiate CPR according to AHA guidelines
- Consider administering epinephrine and atropine (1st drawer)

Documentation of Code Events

A detailed chronological record of all interventions during the code must be documented on the resuscitation record. Please refer to the Policy in the hospital wide Policy & Procedure manual in the cardiology section for documentation guidelines.

Documentation must include:

- Time the code was called and time of the physicians arrival
- Staff in attendance at code (interns, residents, nurses)
- Time CPR was started
- Any actions taken
- Patient’s response (vital signs, cardiac rhythm)
- Time of intubation, tube size and lip line (LL) in centimeters (cm)
- Time of defibrillation and the energy used

- Time and sites of IV initiations
- Types and amounts of fluids administered
- Time of medications given
- EKG rhythm strips to document events and response to treatment
- Disposition: Patient condition following resuscitation or transfer to ICU

End of Code

The patient should be transferred to the critical care unit as soon as possible for post resuscitation care, which includes airway management, blood pressure maintenance, oxygenation, and control of dysrhythmias. Once the patient is transferred with cardiac monitoring, ensure documentation is thorough and complete.

End of code responsibilities also include:

- Ensure family is contacted. If the family is present during the code, assign a support person to inform them of the events during and after the code
- Ensure patient's physicians are contacted
- Clear room of equipment.
 - Use caution with blood and body fluids.
 - Sharps precautions.
- Take crash cart with all equipment (O2 tank, suction machine, red box, gray box, intubation supplies and clipboard) to sterile processing with a gray charge slip indicating the patients name and medical record number. A new crash cart will be issued.
- Support staff and have a debriefing session.

Post Resuscitation Care

In the event the patient is unable to be immediately transferred to the ICU, it is critical that the patient be monitored during the post resuscitation period. Some patients may respond after a code by becoming awake and alert while others may be unconscious. Remain with the patient while providing an ongoing physical assessment and monitoring the vital signs, pulse oximetry, and EKG rhythm. Continue to use the ABCD's (airway, breathing, circulation, defibrillation/drugs) to organize care with a goal of ensuring oxygenation and perfusion.

Criteria for monitoring the patient during the immediate post resuscitation period:

- Establish a nonhostile environment to restore cerebral function to optimize oxygenation and perfusion by:
 - maintaining normothermia; hyperthermia increases oxygen requirements
 - controlling seizures; increases oxygen requirements
 - elevating HOB >30 degrees to increase cerebral venous drainage and decrease intracranial pressure
- Treat hypotension per physicians orders: may impair recovery of cerebral function
 - Fluids
 - Inotropics

- Vasopressors
- Post resuscitation VF/Pulseless VT; administer medications/treatment per physician orders
 - Beta-adrenoreceptor blocking agents
 - Antiarrhythmics
 - Magnesium sulfate
 - Defibrillation
- Post resuscitation Tachycardia; continue to monitor the patient and follow physicians orders
- Post resuscitation Bradycardia; evaluate ABCD's and follow physicians orders
 - Atropine
 - Cardiac pacing
- Post resuscitation Premature Ventricular Contractions (PVC's); evaluate ABCD's & electrolytes

Troubleshooting the Code

Problem	Intervention
Unsure "who" is in charge	State, "Will the physician in charge please state and spell their last name"
Unsure "what" is happening	Ask clearly (i.e. please clarify drug dose)
Too loud	Request that <u>only</u> the physician in charge speak
Too many people	Request for anyone not directly involved in the code to leave
Confusing	Make sure <u>one</u> physician is in charge and giving orders
Patient not resuscitating	Think: optimal oxygenation & circulation <ul style="list-style-type: none"> ▪ Pulse with compressions? ▪ ABG results ▪
Unsure of "where" patient should go next	Ask physician if an ICU bed is needed

References

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