

Code Blue and Rapid Response Protocol

Cardiac or Respiratory Arrest

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updated 4/2014

Objectives

- Understand Pullman Regional Hospitals Rapid Response and Code Policy
- Describe each team members role
- Review American Heart Associations 2014 updates

Pearls of Successful Resuscitation

- Early recognition of deterioration
- High quality CPR with minimal interruptions
- Early Defibrillation
- Organized Rapid Response and Code Blue teams
- Clear understanding of one's role and ACLS guidelines

Updated Guidelines 2014

- Chest compression fraction (CCF) $>80\%$ - this is the ratio of compression time (hand on time)/total arrest time expressed in a percentage- want it greater than 80%
- Chest compression rate 100-120 (on target to $+20$)- the old stayin alive song matches these ratios perfectly again!
- Chest compression depth must be of $>$ or $=$ to 2 inches and at least one-third the anterior-posterior diameter of the chest in infants and children
- Full chest recoil; no residual leaning
- Avoid excessive ventilations rate $<$ or $=$ to 12 breaths per minute, minimal chest rise.

Rapid Response: When to Call

- Are you worried about your patient?
- **ACUTE** change in neurological status. **If yes,**
- activate RRT for **Code Stroke**
- **ACUTE** change in heart rate <40 or >130
- **ACUTE** change in systolic blood pressure to <90
- **ACUTE** change in respiratory rate <8 or >30
- **ACUTE** change in pulse oximetry to $<90\%$
- **ACUTE** change in level of consciousness
- **ACUTE** change in urine output to $<120\text{ml}$ in 4 hours

Process for Rapid Response

- Dial zero “o”
- Vocera
- Overhead page
- Response is less than 5 minutes
- ICU nurse will bring Rapid Response Team Kit and transport monitor
- Respiratory will bring 12 EKG
- Primary nurse will report to ICU and RT using SBAR
- Standing orders may be implemented if indicated

Adult

Used/Replaced	SUPPLY	PARR LEVEL	Top or bottom of kit
	Alcohol swab	6	Top
	Chlorohex sep	2	Top
	0.9%NS 10ml	2	Bottom
	IV start kit	2	Top
	InterLink Lever Lock needless adaptor	2	Top
	Twin Pack needless adaptor	2	Top
	10ml twin pack syringe	2	Top
	0.9NS 1,000	1	Bottom
	Continue flow solution set	1	Bottom
	20 g IV catheter	2	Top
Lab tubes			
	Green	1	Top
	Red	1	Top
	Blue	1	Top
	Purple	1	Top
Respiratory			
	Nebulizer:adult	1	Top
	NRB mask: adult	1	Bottom
	NC: adult	1	Bottom
	ABG kit 5ml	2	Bottom
	Albuterol unit dose	1	Top

Pediatric Supplies (birth to 8 years of age)

Used/Replaced	SUPPLY	PARR LEVEL	Top or bottom of kit
	Alcohol swab	6	Top
	Chlorohex sep	2	Top
	0.9%NS 10ml	2	Bottom
	IV start kit	2	Top
	InterLink Lever Lock needless adaptor	2	Top
	Twin Pack needless adaptor	2	Top
	10ml twin pack syringe	2	Top
	0.9NS 1,000	1	Bottom
	Continue flow solution set	1	Bottom
	24 g IV catheter (BD)	2	Top
Pediatric Lab tubes			
	Green	1	Top
	Red	1	Top
	clear	1	Top
	Purple	1	Top
Respiratory			
	Nebulizer:Child	1	Top
	NRB mask: Child	1	Bottom
	NC: Child	1	Bottom
	ABG kit: 1ml	2	Bottom
	Albuterol unit dose	1	Top

Standing Orders

- CT and creatinine for neuro
- ACLS/PALS guidelines
- Oxygen
- Fluid bolus
- SVN
- ABG
- CXR
- EKG
- Labs (CBC, MG+, BMP, Lactate
- Narcan
- Glucose

Code Blue

- Patient is having either a medical emergency, cardiac or respiratory difficulties
- Respiratory arrest: no breathing or inadequate respirations
- Cardiac arrest: the heart has stopped beating or is in a rhythm which has no flow or low flow

Process

- Calling a code
 - outside of building call 911
 - non-patient areas: dial 5555 and say “code blue”
your area in the hospital
 - patient care area: push code blue button

Equipment

- Code cart locations:
 - ED rooms 1 and 3
 - ICU
 - Birthplace
 - PACU
 - Imaging
 - extra cart in Resource and Materials

Roles

- Physician Team Leader
- Nurse Team Leader
- Respiratory
- Lab
- CNA
- MSU nurse
- Birthplace nurse
- Second ICU nurse
- Clinical Coordinator
- Pharmacy
- Unit Secretary

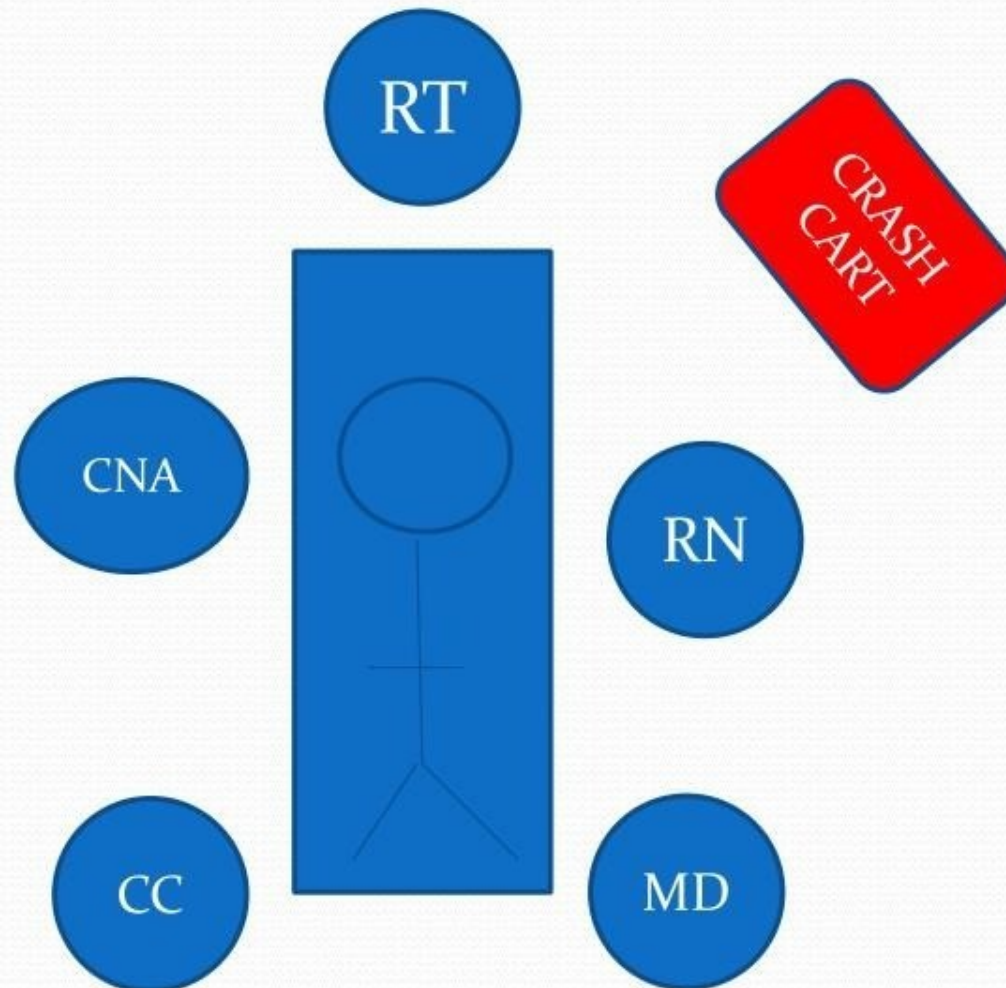
Chain of Command

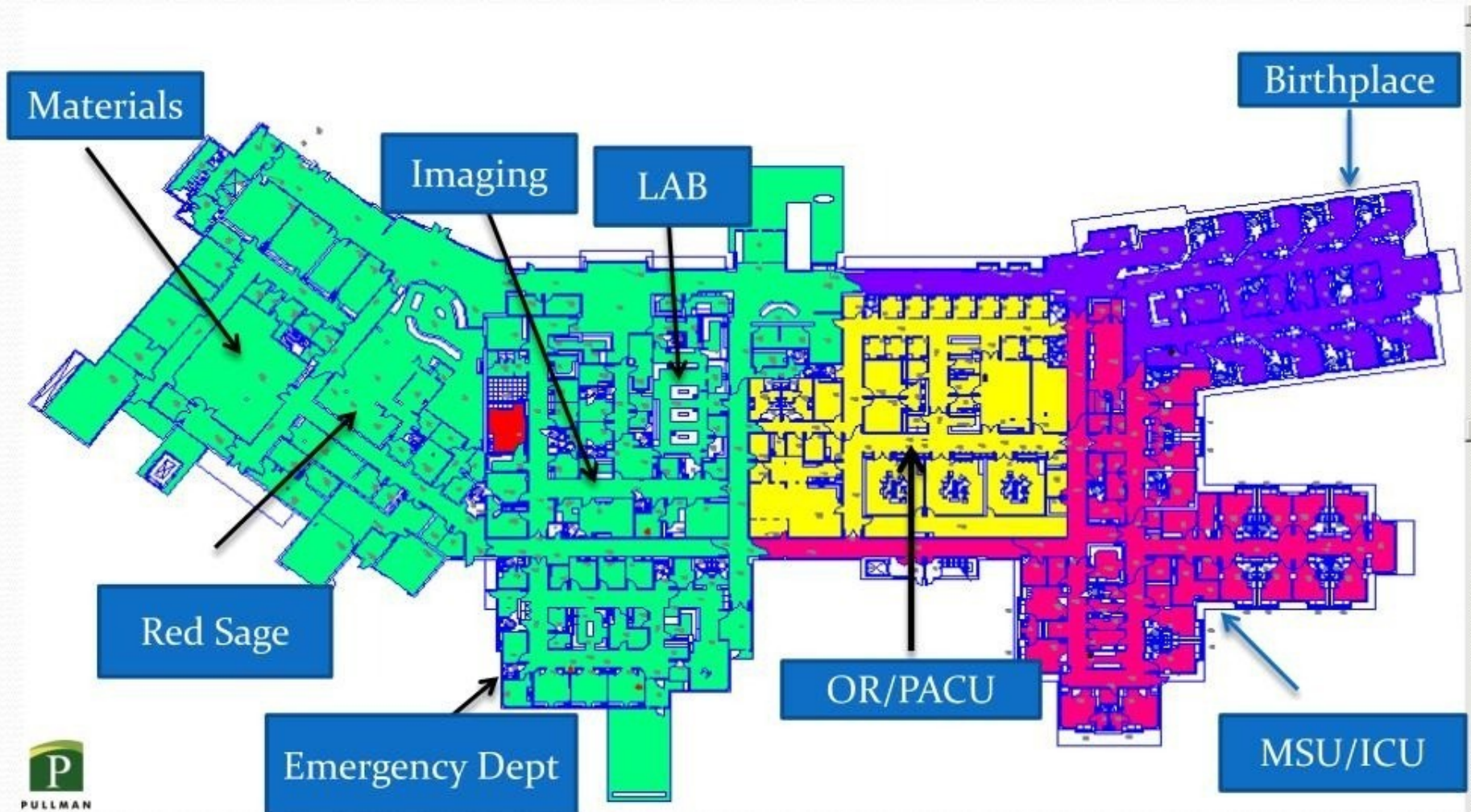
- ED physician/Hospitalist/Pediatrician/PCP
- All ACLS certified RNs for adult code blue
- All PALS certified RNs for pediatric code blue
- All NRP RNs for newly born code blue
- In the ED the ED physician will be code leader unless mutually agreed upon with the PCP
- The code Team Leader will wear the Red cap

Job Descriptions for Code Team Members

- Physician Team Leader
- Nurse Team Leader
- Respiratory Therapy
- Chest compressions
- Medication
- Recorder
- Runner

Who Goes Where?





1

Witnessed arrest: ☐ Yes ☐ No Type of arrest: ☐ Cardiac ☐ Respiratory

Date: / / Time Code Called

[illegible]

Physician's Signature. _____

Rhythm = 1) A= asystole 2) AF= Atrial Fib 3) AFL= Atrial flutter Otherwise use common mnemonic ie SVT, PEA ect.

Procedures = 1) NG = Nasogastric tube 2) FC = Foley catheter 3) CT = chest tube 3) IV = Intravenous 4) CXR = chest x-ray 5) Any accepted abbreviation

Lab sites = 1) R= radial 2) B = brachial 3) F= femoral 4) L= Line draw.

CODE ARREST FORM **Patient Weight**

2

Code Team Members:

Physician leader _____
Nurse Leader _____
Respiratory Therapy _____
Compressions _____
Recorder _____
CC _____
Pharmacy _____

Intubation:

Time: _____
By: _____
ETT size _____
Incisor line _____
Bilateral breath sounds ☐ Yes ☐ No
Easy Cap Yellow? ☐ Yes ☐ No
Chest X-ray done? ☐ Yes ☐ No
Time _____

Notification:

Primary physician _____
Family _____
Chaplain _____
Comments: _____
Coroner ☐ Yes ☐ No
Name of Coroner _____
Time: _____

Outcome:

☐ Survived,
Transferred to _____
☐ Report called
Time: _____
☐ Deceased,

Input= _____ cc Output= _____ CC

Narrative Nurses Notes:

Signature of recorder

Signature of nurse team leader

RN

- ☐ Pharmacy charge sheet is filled stamped and has been returned to pharmacy
- ☐ Code critique form has been filled out and sent to the nurse manager.
- ☐ Materials Management has been notified that the code cart has been used.

Key: **LOC:** 1) U= Unresponsive 2) A= Agitated 3) L = Lethargic 4) AA = Awake and Alert 5) P= Responds to painful stimuli 6) V = Responds to voice
Rhythm = 1) A= asystole 2) AF= Atrial Fib 3) AFL= Atrial flutter Otherwise use common pneumatic ie SVT, PEA ect.
Respiratory = 1) BVM= bag valve mask 2) A= attempted intubation 3) I= successful intubation 4) S= spontaneous respirations
Procedures = 1) NG = Nasogastric tube 2) FC = Foley catheter 3) CT = chest tube 3) IV = Intravenous 4) CXR = chest x-ray 5) Any accepted abbreviation
Lab sites = 1) R= radial 2) B = brachial 3) F= femoral 4) L= Line draw.

The Code Cart: Top of Cart

- Lifepak 12
- Yellow Bin:
 - adult and pediatric Quick-Combo patches
 - EKG paper
 - adult EKG electrode (red dot)
 - Pediatric EKG electrode (green dot)
 - gel pads
 - adult and pediatric easy cap
- Clip board: Code Arrest form and Critique form
- Disposable razor
- Color Coding Kids book and pens
- Black binder with extra forms and code cart daily checklist
- Red team leader caps
- Percutaneous sheath introducer kit

Code Cart: Right Side

- Gloves: medium and large
- Portable oxygen tank (psi > 500)
- Infant, pediatric, and adult ambu bags

Code Cart: Left Side

- Sharps container
- Portable suction
- Handles for steering cart

Code Cart: On the Back

- Backboard

Drawer 1: Adult Airway

- Laryngoscope handles
- Laryngoscope blades
 - Macintosh (curved) sizes #1, #2, #3, #4
 - Miller (straight) sizes #00, #0, #1, #2, #3
- McGills forceps (adult)
- Tongue blades
- KY jelly
- 2% Lidocaine jelly
- Oral airways: #0, #1, #2, #3, #4, #5, #6

Drawer 1: Adult Airway Cont.

- Bite block
- 10 ml syringe
- ETT holder
- Mastisol adhesive
- EID intubation detection bulb
- 4% lidocaine Laryngoject
- Stylette
- Hurricane spray
- Cuffed ET tubes sizes 6-9
- RSI box:
 - atropine 1mg vial
 - pavulon 10mg vial
 - phenylephrine 0.5%
 - rocuronium 100mg/10ml
 - succinylcholine 100mg/5ml
- Extra lamp for intubation handles

Drawer 2: Adult Medications

- Adenosine 6mg/2ml
- Amiodarone 150mg/3ml
- Atropine 1mg/10ml
- Calcium gluconate 4.65mEq/10ml
- Dextrose 25G/50ml
- Dobutamine 500mg/250ml
- Dopamine 400mg/250ml
- Epinephrine 1mg/10ml (1:10,000)
- Epinephrine 1mg/ml (1:1000)
- Lidocaine 100mg/5ml
- Mg sulfate 4G/100ml
- Naloxone 0.4mg/ml 1 ml
- Procan 1 G/2ml
- Na bicarb 50 mEq/50ml
- Verapamil 10mg/4ml
- Lidocaine 1 G/250ml

Drawer 3: Adult Fluids

- NS 1000ml
- D5W 100ml
- Primary tubing
- IV catheters:
 - 24g, 22g, 20g, 18g, 16g
- Butterfly needles:
 - 23g, 25g
- Syringes:
 - tuberculin, 3ml, 10ml
- Tape: 2" zonas, 1" transpore
- IV start kits
- Tegaderm 4x5
- Povidone iodine swab/pads/ampule
- Alcohol swabs and pads
- ABG kits
- NS prefilled syringes
- 19g filter needle
- Needleless IV adapters
- Extension set

Drawer 4: Procedure/Suction/O2

- Adult ambu bag
- Adult blood tubes
- Sterile gloves sizes 6-9
- Spinal needles
- Providone iodine
- 60ml cath tip syringe
- KY Jelly
- Suction bin:
 - suction tubing
 - yankauer
 - 14fr suction catheter
 - Adult NRM
- Green Christmas trees
- 5 way connector
- Scissors
- Flashlight
- O2 supply tubing connector

Drawer 5: Pediatric IV

- Pediatric med box
 - atropine 1mg/10ml
 - calcium chloride 1g/10ml
 - dopamine 200mg/5ml
 - epinephrine 1mg/10ml (1:10,000)
 - epinephrine 1mg/1ml (1:1000)
 - furosemide 20mg/2ml
 - lidocaine 100mg/10ml
 - naloxone 0.4mg/1ml
 - Na bicarb 5 mEq/10ml
- Pediatric arm board
- 3 way stop cock
- Buretrol primary IV tubing
- Pediatric blood tubes: small green, red, purple, 1.8ml blue, large red, green, and purple
- IO: 18g, 15g
- IV catheters 22g, 24g
- 60ml leur lock syringe
- Iv extension set
- NS 500ml

Drawer 6: Pediatric Airway

- Blue Broselow laryngoscope handles: small and large
- Blue key for changing lamp in handles
- Pediatric Easy Cap
- Tongue blades
- Small McGills forceps
- Bulb syringe
- Pulse oximeter: neonatal, child, small adult
- Disposable BP cuff: infant, child, small adult
- BP manometer
- U-bag
- Pediatric Lifepak 12 paddles
- Extra lamp for Broselow handles (one size)
- Pediatric stethoscope

Drawer 7: Broselow/Ambu

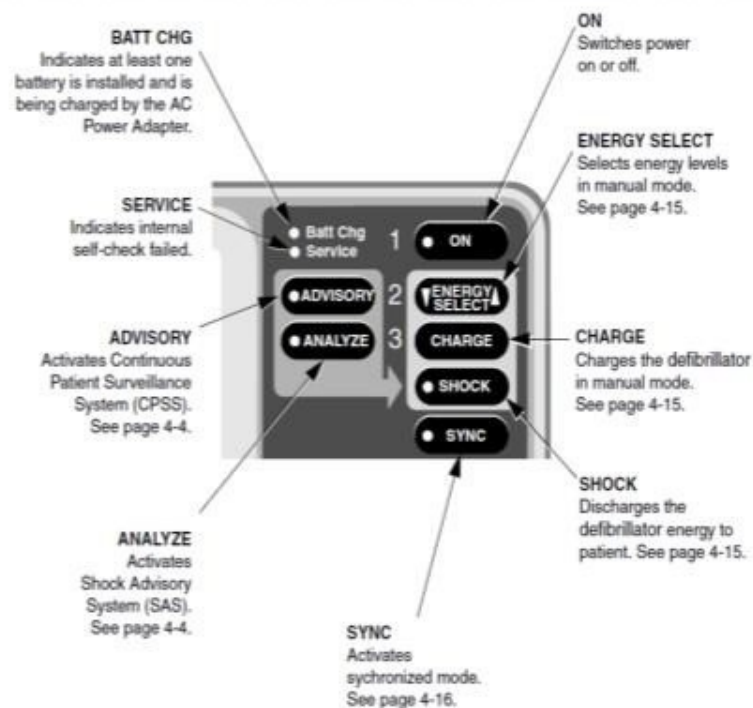
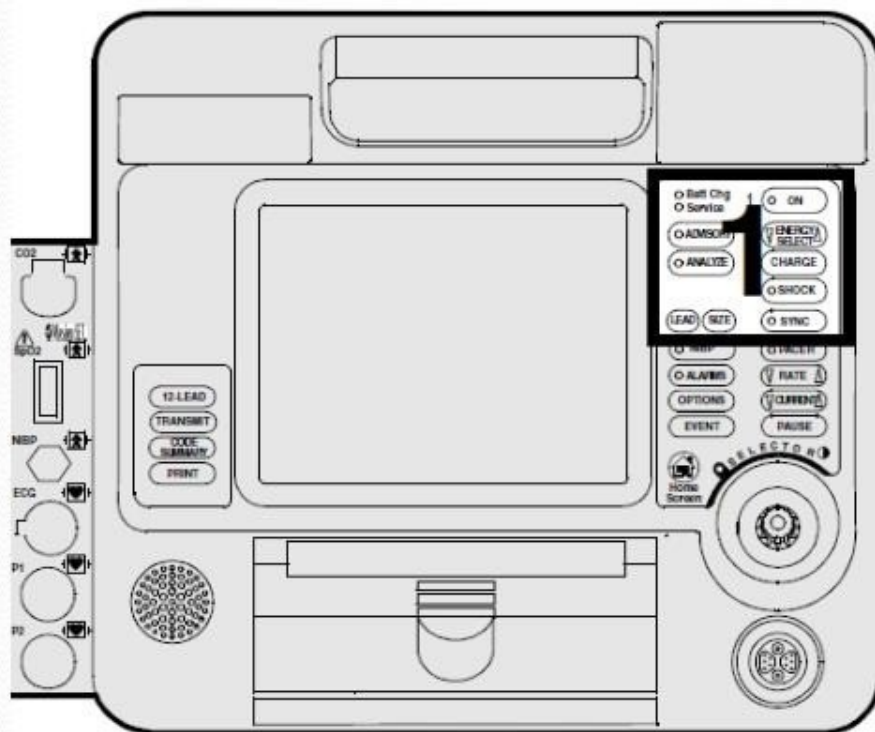
- Ambu-bag: infant and child
- Broselow tape
- Locked color coded Broselow kits:
 - O₂ delivery module
 - intubation module
 - IV delivery module
 - IO module (not in orange or green)

Lifepak 12

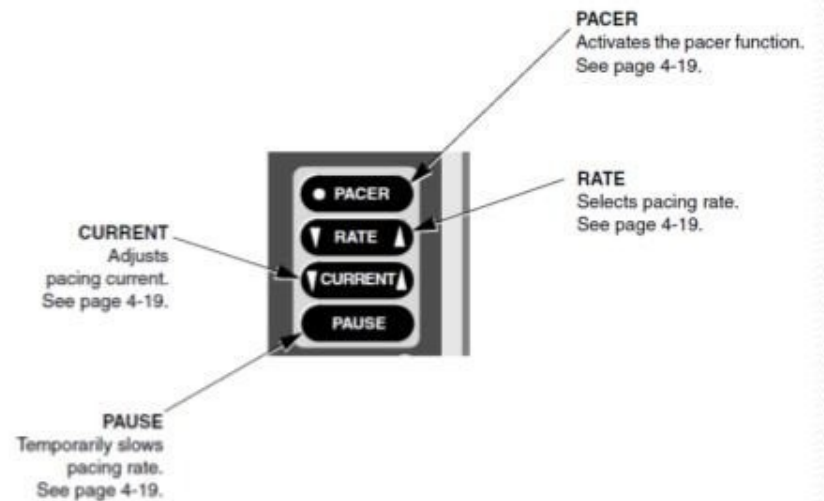
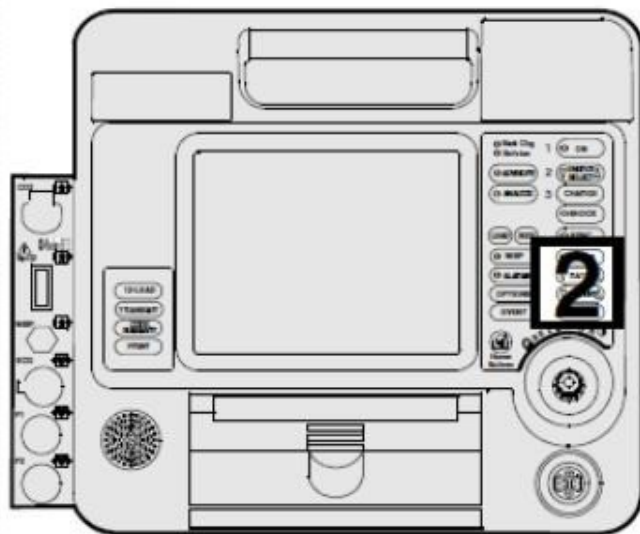
- Biphasic defibrillation
 - hands free using quick combo pads
 - paddles
- Transcutaneous pacing
- Cardioversion
- AED
- 3 EKG, SpO₂, NIBP



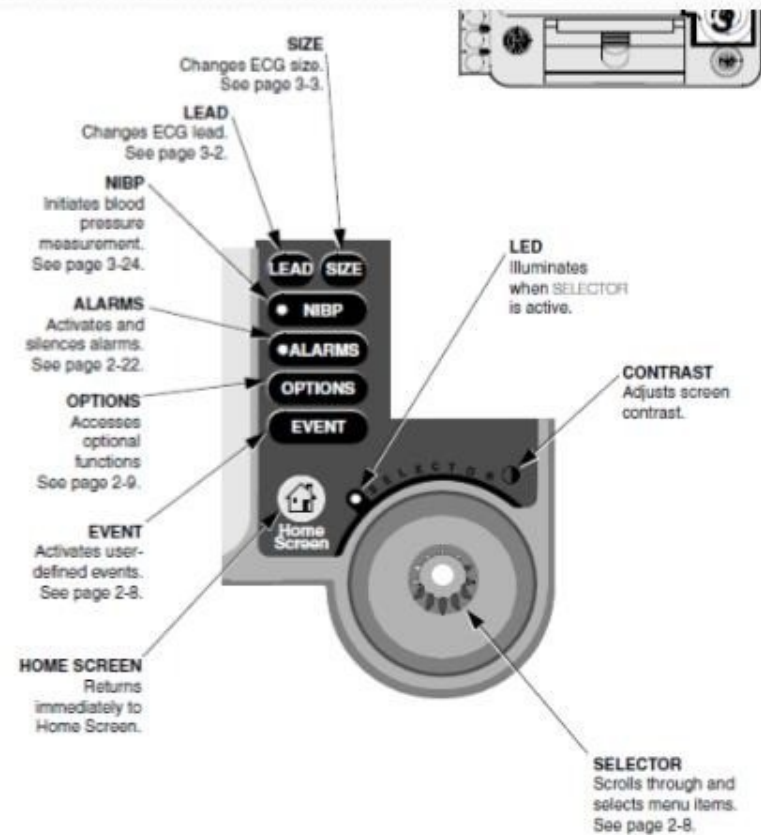
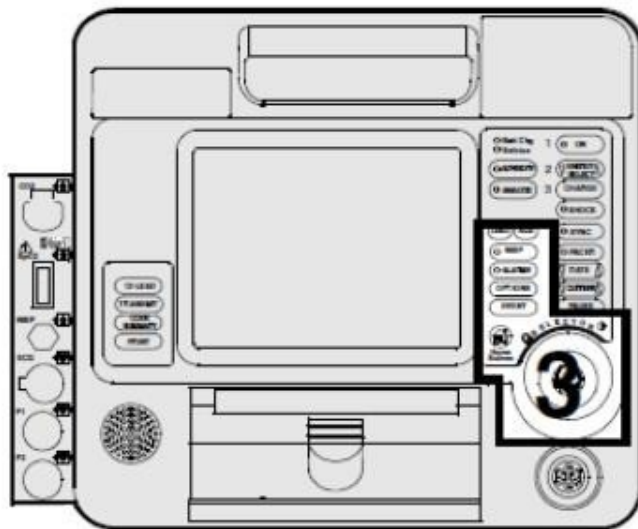
Area 1



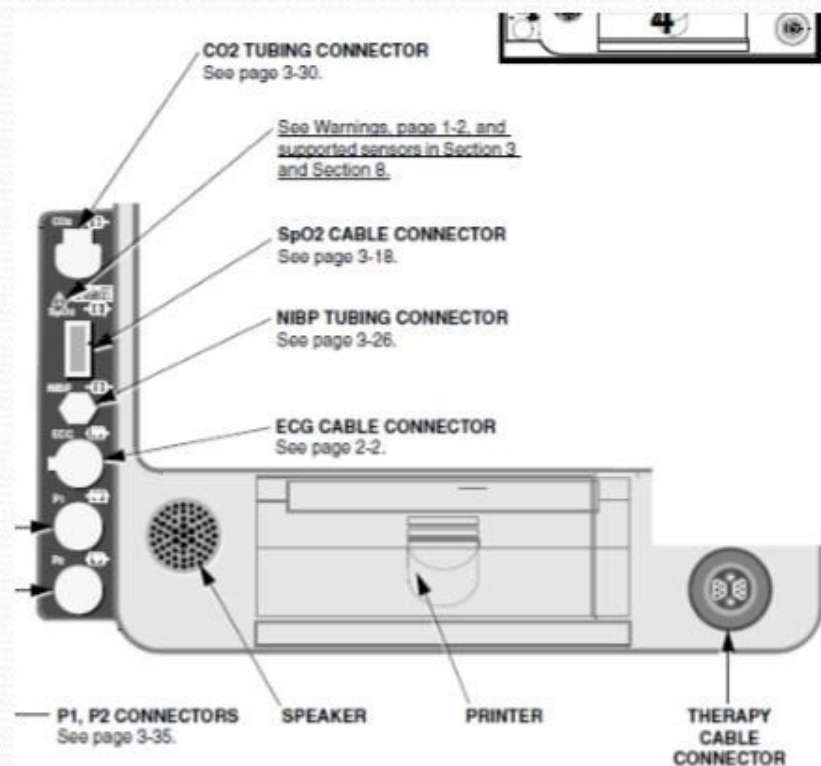
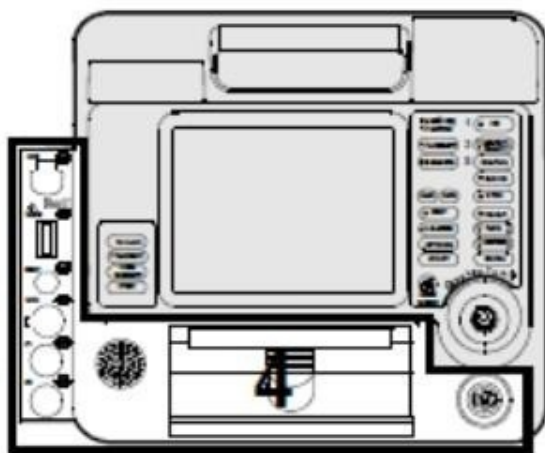
Area 2



Area 3



Area 4



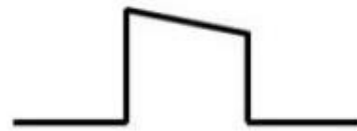
Anterior Posterior



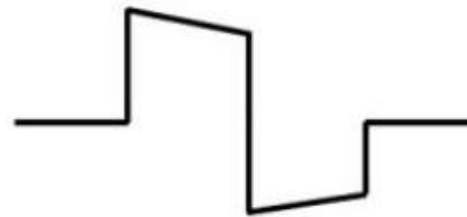
Anterior Lateral



Monophasic vs. Biphasic



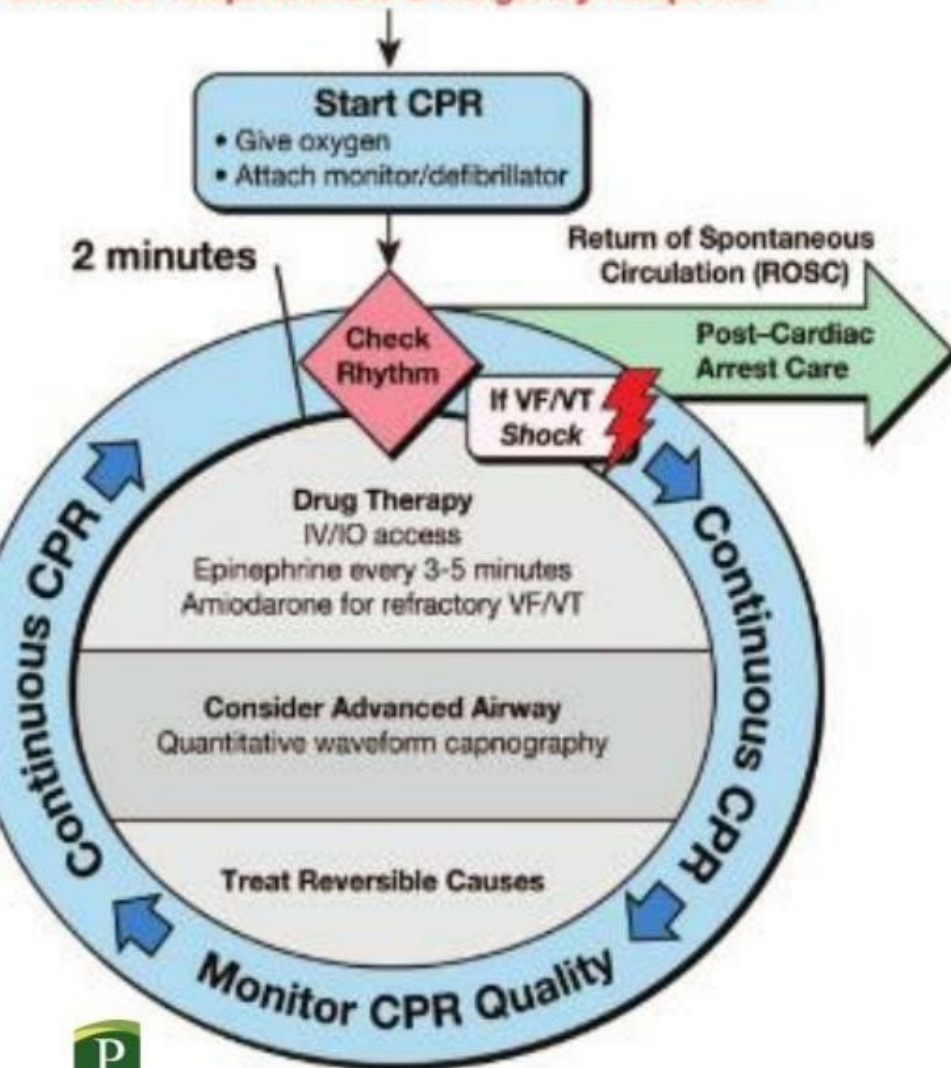
Monophasic



Biphasic

Adult Cardiac Arrest

Shout for Help/Activate Emergency Response



CPR Quality

- Push hard (≥ 2 inches [5 cm]) and fast (≥ 100 /min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
 - If $PETCO_2 < 10$ mm Hg, attempt to improve CPR quality
- Intra-arterial pressure
 - If relaxation phase (diastolic) pressure < 20 mm Hg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Abrupt sustained increase in $PETCO_2$ (typically ≥ 40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Shock Energy

- **Biphasic:** Manufacturer recommendation (120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- **Monophasic:** 360 J

Drug Therapy

- **Epinephrine IV/IO Dose:** 1 mg every 3-5 minutes
- **Vasopressin IV/IO Dose:** 40 units can replace first or second dose of epinephrine
- **Amiodarone IV/IO Dose:** First dose: 300 mg bolus. Second dose: 150 mg.

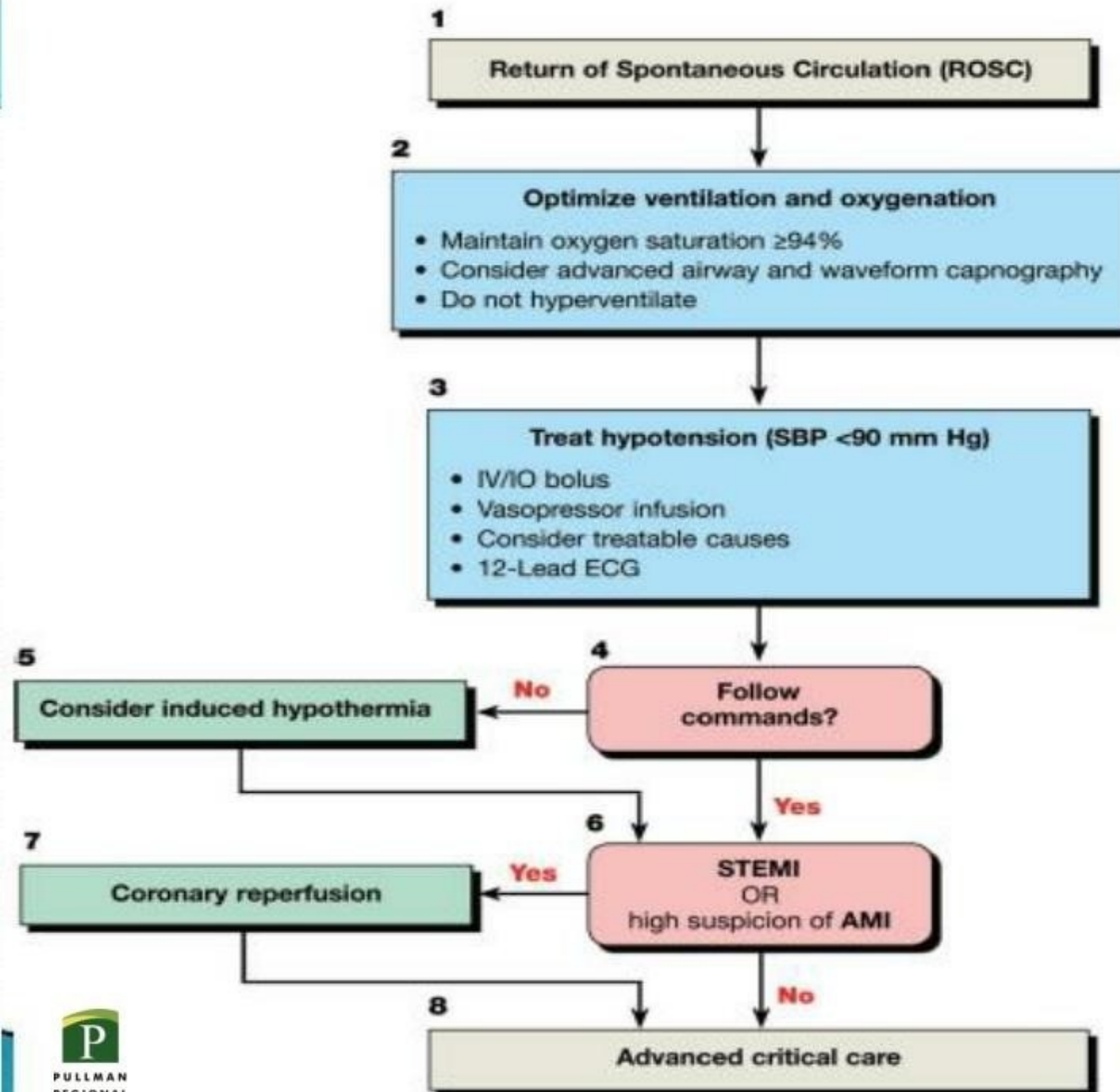
Advanced Airway

- Supraglottic advanced airway or endotracheal intubation
- Waveform capnography to confirm and monitor ET tube placement
- 8-10 breaths per minute with continuous chest compressions

Reversible Causes

- | | |
|---------------------------|-------------------------|
| – Hypovolemia | – Tension pneumothorax |
| – Hypoxia | – Tamponade, cardiac |
| – Hydrogen ion (acidosis) | – Toxins |
| – Hypo-/hyperkalemia | – Thrombosis, pulmonary |
| – Hypothermia | – Thrombosis, coronary |

Adult Immediate Post-Cardiac Arrest Care



Doses/Details

Ventilation/Oxygenation

Avoid excessive ventilation. Start at 10-12 breaths/min and titrate to target PETCO₂ of 35-40 mm Hg. When feasible, titrate FIO₂ to minimum necessary to achieve SpO₂ $\geq 94\%$.

IV Bolus

1-2 L normal saline or lactated Ringer's. If inducing hypothermia, may use 4°C fluid.

Epinephrine IV Infusion:

0.1-0.5 mcg/kg per minute (in 70-kg adult: 7-35 mcg per minute)

Dopamine IV Infusion:

5-10 mcg/kg per minute

Norepinephrine

IV Infusion:

0.1-0.5 mcg/kg per minute (in 70-kg adult: 7-35 mcg per minute)

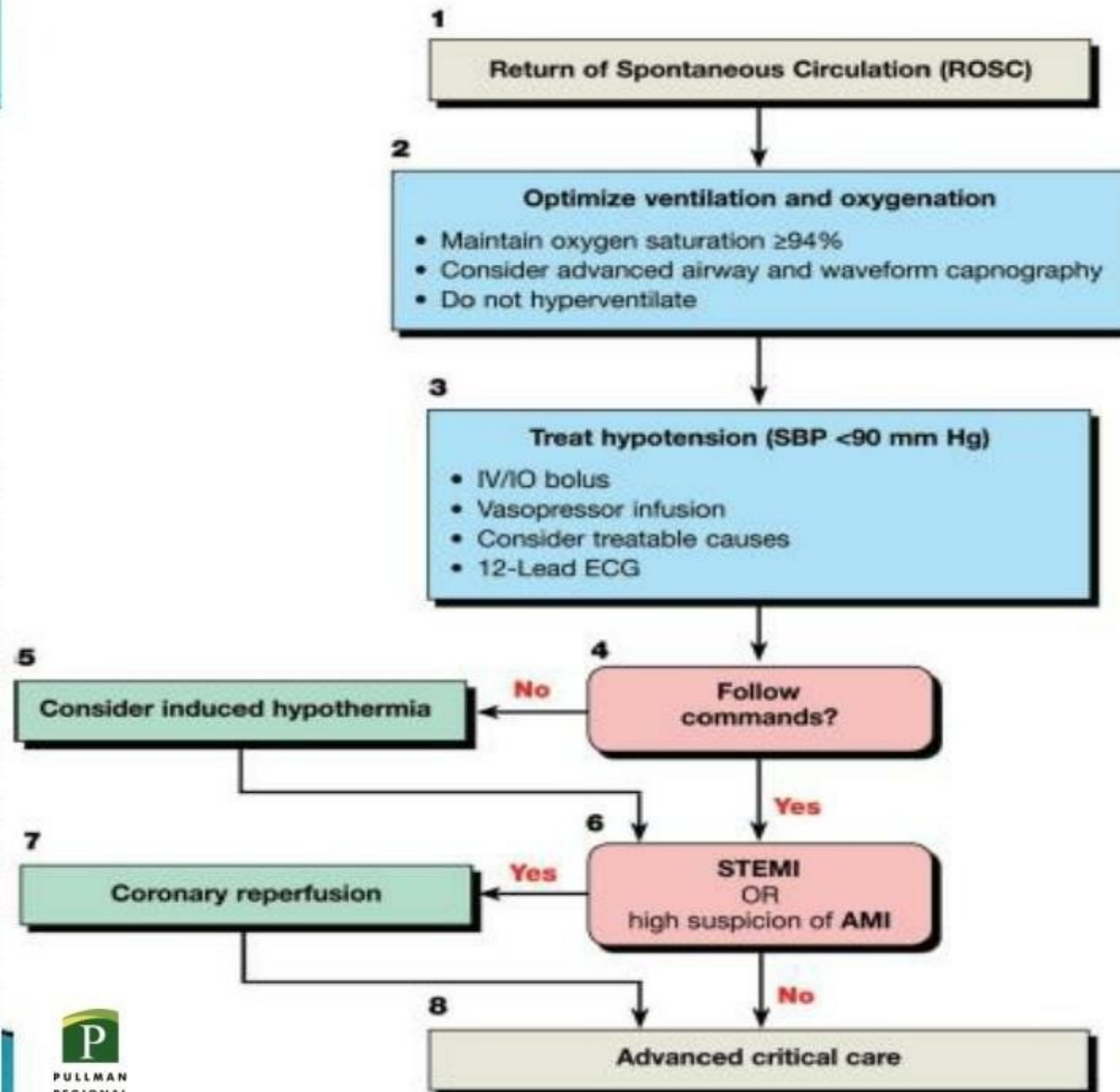
Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary



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Adult Immediate Post-Cardiac Arrest Care



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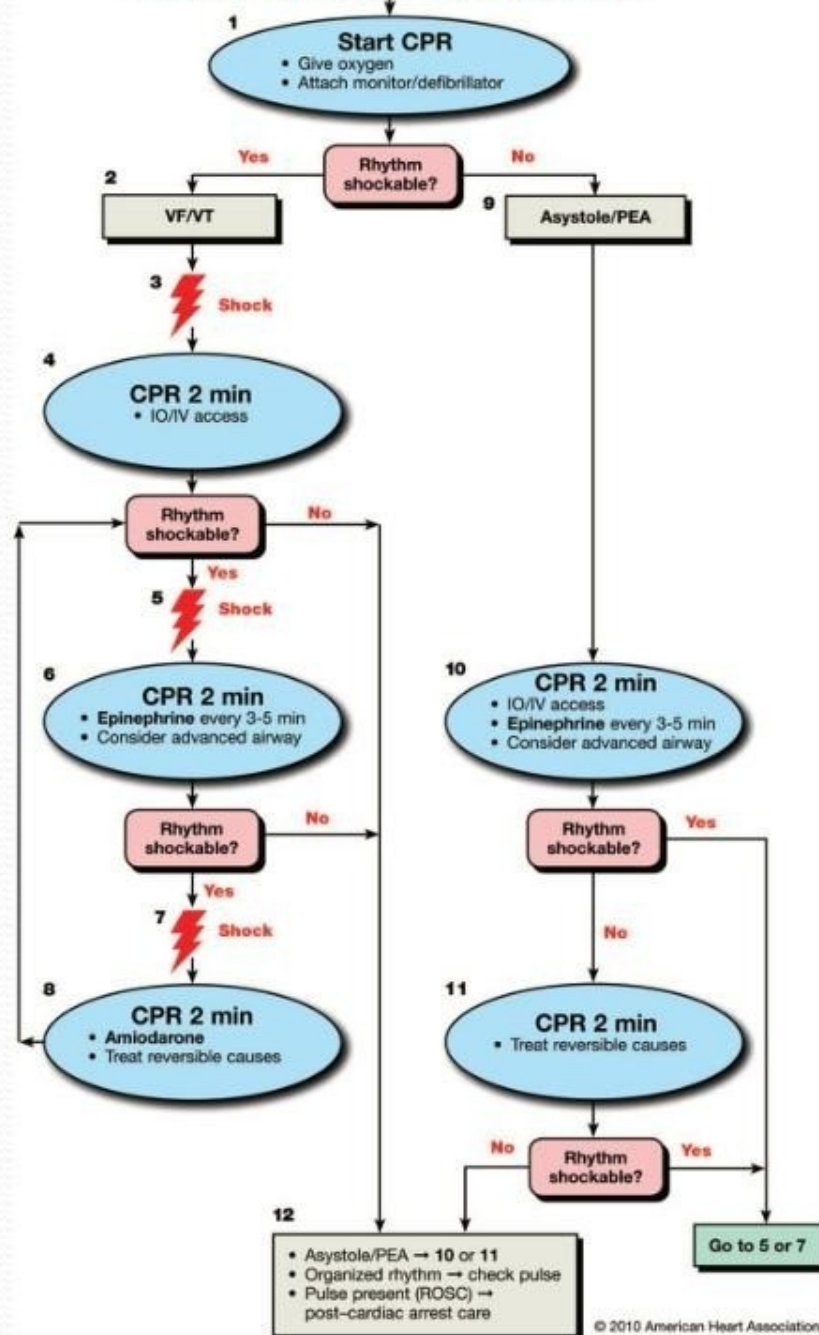
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- Thrombosis, pulmonary
- Thrombosis, coronary



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Shout for Help/Activate Emergency Response



CPR Quality

- Push hard ($\geq 1/3$ of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 8-10 breaths per minute with continuous chest compressions

Shock Energy for Defibrillation

First shock 2 J/kg, second shock 4 J/kg, subsequent shocks ≥ 4 J/kg, maximum 10 J/kg or adult dose.

Drug Therapy

- **Epinephrine IO/IV Dose:** 0.01 mg/kg (0.1 mL/kg of 1:10 000 concentration). Repeat every 3-5 minutes. If no IO/IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
- **Amiodarone IO/IV Dose:** 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

Advanced Airway

- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or capnometry to confirm and monitor ET tube placement
- Once advanced airway in place give 1 breath every 6-8 seconds (8-10 breaths per minute)

Return of Spontaneous Circulation (ROSC)

- Pulse and blood pressure
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypoglycemia
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary

Thank You



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References

- 2010 ACLS Guidelines, . (2010). *Acls-algorithms*. Retrieved from <http://acls-algorithms.com/2010-acls-guidelines>
- Pullman Regional Hospital, Initials. (2010). *Code blue and rapid response policy*.