

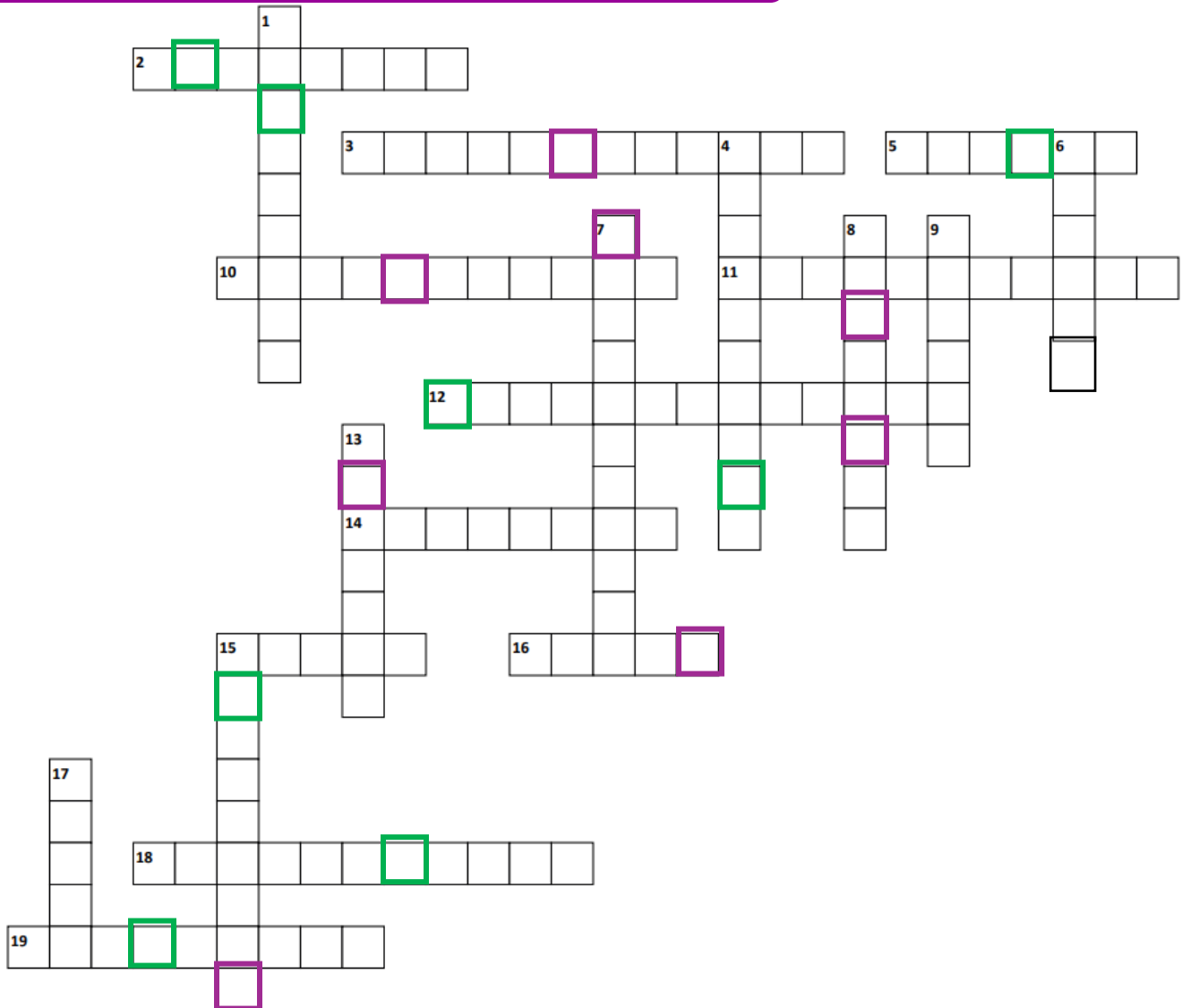
Challenge # 1: Test your knowledge

1. You are preparing emergency medications for your adult patient who weighs 80 kg, according to your emergency drug sheet (EDS) what dose of sodium bicarbonate will you prepare?
 - a. 40 mEq
 - b. 50 mEq
 - c. 80 mEq
 - d. 160 mEq
2. Your 65 kg patient is hypertensive, and the team would like to initiate a Nicardipine continuous infusion, what starting dose would you expect to initiate?
 - a. 1 mcg/kg/minute
 - b. 5 mcg/kg/minute
 - c. 5 mg/hour
 - d. 15 mg/hour
3. Adult patients that have previously undergone a Fontan procedure are at risk for the following possible complications. Select all that apply.
 - a. Arrhythmias
 - b. Thromboemboli
 - c. Protein-losing enteropathy
 - d. Hepatic dysfunction
4. According to ACLS guidelines, what dose of Adenosine should be administered first for tachycardia with a pulse?
 - a. 0.1 mg/kg
 - b. 3mg
 - c. 6mg
 - d. 12mg
5. According to ACLS guidelines, when is amiodarone indicated in cardiac arrest?
 - a. For asystole
 - b. After return of spontaneous circulation
 - c. For refractory VF/pulseless VT after defibrillation
 - d. For symptomatic bradycardia
6. In the B.E. F.A.S.T. acronym for stroke recognition, what does the "B" stand for?
 - a. Balance loss
 - b. Blood pressure
 - c. Breathing changes
 - d. Brain pain

Cardiac Education Series: Adult CHD Considerations

7. Which of the following can cause suction alarms on an Impella device? (select all that apply)
- a. Inadequate LV filling
 - b. Incorrect position in LV
 - c. RV failure
 - d. Adequate volume status
8. Which of the following are long-term complications for patients with a coarctation of the aorta, despite adequate childhood surgery? (Select all that apply)
- a. Systemic hypertension
 - b. Recoarctation
 - c. Aortic aneurysm and dissection
 - d. Sudden cardiac death

Challenge #2: Crossword Puzzle

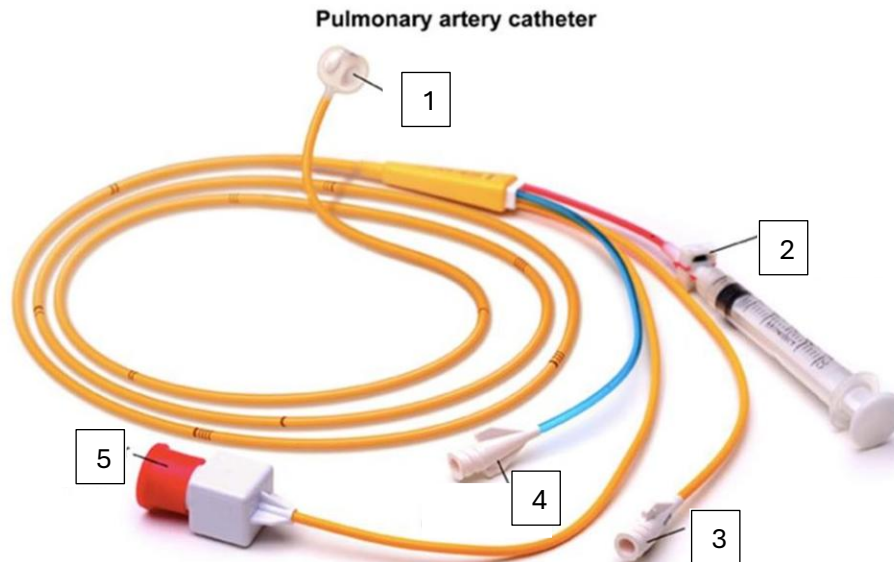


Cardiac Education Series: Adult CHD Considerations

ACROSS	DOWN
2. Environmental modifications (such as day/night lighting, communication boards, call bells within reach) and limiting benzodiazepines can help to avoid post-operative _____ in the adult patient.	1. ACLS guidelines recommend this medication as an alternative to amiodarone for cardiac arrest with pulseless VT or VF (unresponsive to defibrillation, CPR, and vasopressor administration). Hint: the initial dose is 1mg/kg.
3. Which electrolyte imbalance can contribute to a prolonged QT segment?	4. Your patient is being admitted post coronary unroofing, which monitoring do you need to activate upon admission?
5. _____ Arrhythmias might be seen in patients with Ebstein's Anomaly due to the severe right atrial dilatation.	6. An _____ aneurysm or pseudoaneurysm may occur years after successful repair of a coarctation of the aorta.
10. Large left to right shunts that are either not repaired or found as an adult typically lead to elevated pulmonary vascular resistance and _____ syndrome.	7. The greatest concern for adults that had previously undergone repair for Tetralogy of Fallot is _____ arrhythmias.
11. Protein-losing _____ is a complication associated with Fontan failure.	8. Device closure with the Amplatzer atrial septal occluder is typically only used for _____ ASDs. Hint: refers to the type/location of the ASD.
12. _____ is a Beta ₁ & Beta ₂ -adrenergic agonist that can be used to treat symptomatic bradycardia or AV nodal blocks. Hint: for adults it is dosed in mcg/min with a usual range of 2-20 mcg/min.	9. A _____ switch operation may be performed for a patient with congenitally corrected transposition of the great arteries to restore the LV to the systemic position.
14. Atrial arrhythmias can lead to atrial _____ formation.	13. According to the ACLS guidelines for cardiac arrest in pregnancy, providers should maintain continuous _____ uterine displacement when the fundal height is at or above the umbilicus.
15. When evaluating blood loss in adults, it is important to consider the _____ volume of blood loss, rather than ml/kg alone.	15. Ebstein's Anomaly is a rare defect that involves an abnormality in the _____ valve.
17. Tight glycemic control lowers the incidence of _____ infections, reduces hospital length of stay, and enhances long term survival.	16. The Impella _____ system delivers a fluid with an increased pressure to prevent blood from entering the Impella device motor.
19. Scar tissue and _____ from previous sternotomies might place an adult with a complex surgical history at a higher risk to bleed post-operatively.	18. RV to PA conduits can develop endothelial overgrowth or the valves can stiffen leading to _____, requiring balloon dilation or conduit replacement.

1. Adult patients with and without diabetes who have increased glucose levels both intra-operatively and in the immediate post-operative period have a 10-fold increase in postoperative complications including death.
2. ACLS guidelines include a compression rate of 100-120 beats/minute.
3. When troubleshooting suction alarms on the Impella, the medical team & engineer should consider reducing the P level by 1-2 as they troubleshoot potential causes.
4. Anyone can manipulate the Impella device position.
5. In the B.E. F.A.S.T. acronym for stroke recognition, the 'E' stands for energy loss.
6. Adults with small ASDs may present for the first time after suffering a cerebrovascular accident or transient ischemic attack secondary to embolization across the defect.
7. Nitroglycerin in adult patients (>50kg) should be dosed as mcg/kg/min.
8. The population of adults with CHD continues to rise due to early pediatric diagnosis, and improved medical, surgical, and post-operative care.
9. Adult patients undergoing cardiac surgery are not at risk for stroke.
10. According to ACLS guidelines, pulseless electrical activity (PEA) requires immediate defibrillation.
11. When assessing an Impella device, the RN should assess & document the centimeter marking at the end of the hub of the device and beginning of the sheath (Touhy-Borst valve), as this is critical to ensuring the device remains in the correct location.
12. IV Nitroglycerin requires special administration sets.
13. Patients with congenitally corrected transposition of the great arteries (ccTGA) are always diagnosed in childhood.
14. During pregnancy, the mother's body undergoes changes to circulating blood volume, red cell mass, peripheral vascular compliance and resistance, heart rate, and cardiac output.
15. Cardiac surgery during pregnancy poses no increased risks to the mother or fetus.

Challenge # 4: PA Catheter Identification



Match the correct definition with the number on the pulmonary artery catheter (Swan-Ganz).

Proximal Port: terminates in the right atrium, measuring RA pressure/CVP. Can be used to administer medications and is the site of injection for CO using thermodilution

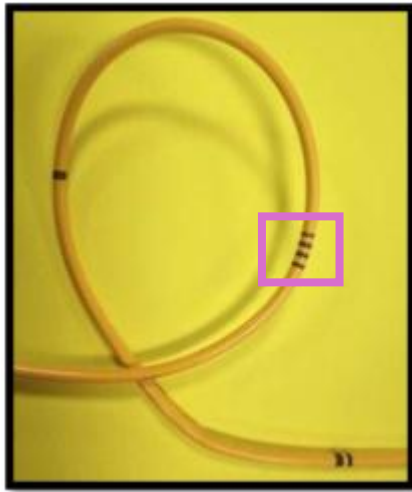
Distal Port: terminates in the pulmonary artery and is **not** an infusion port, measures PA pressures.

Thermistor Port: measures continuous core blood temperature and CO with thermodilution

Balloon Port: controls inflating & deflating balloon during PAOP. Only use the syringe that comes with the PAC.

Balloon: terminates in the pulmonary artery, inflated to measure Pulmonary Artery Occlusion Pressure (PAOP)

1. Hash marks along the length of the pulmonary artery catheter help to verify placement. How many centimeters does this PAC indicate?



2. What is this monitor waveform indicating?

- a. Cardiac output via thermodilution
- b. Pulmonary artery occlusion pressure
- c. Pulmonary artery catheter needs to be re-zero'd
- d. Ventricular fibrillation from a mal-positioned catheter



3. Normal pulmonary artery occlusion pressure is typically 4-12 mmHg. What does it measure?

- a. Left Preload
- b. Left Afterload
- c. Right Preload
- d. Cardiac Index

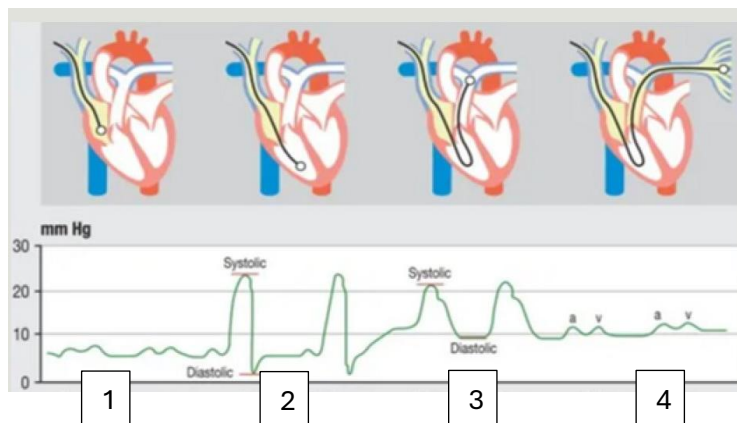
4. This piece of equipment is a large bore catheter in which the PAC is advanced into the vessel. It needs to have KVO fluids running through it while in place.

- Transvenous catheter sheath
- Transvenous cordis
- Introducer cordis
- Subclavian Broviac

5. When the provider comes into the room to measure PAOP, they inflate the kit syringe with 1.5 mL of air and attach to the port. You know (select all that apply):

- If the safety lock is not engaged, there will be a “straight arrow” on the lock indicating air can be administered to the balloon.
- It is okay to use a leur-lock syringe from the equipment room if the kit syringe gets lost because you can use 1.5 – 3 mL of air to inflate the balloon.
- If the safety lock is engaged, there will be a “crooked arrow” on the lock indicating air cannot be administered to the balloon.
- PA Balloon should be inflated for no longer than 8-15 seconds, due to risk of PA rupture (by providers only).
- The balloon port is the green lumen of the pulmonary artery catheter.

Name that Waveform



- _____ Pulmonary Artery Occlusion/Wedge
- _____ Right Ventricular
- _____ Right Atrial/CVP
- _____ Pulmonary Artery

Challenge # 5: Certification Corner

Answer the following questions to boost your adult knowledge. These practice questions are prep questions for the adult CCRN exam.

1. A patient returns to the unit after implantation of a permanent dual chamber pacemaker. You note the patient is in atrial fibrillation. What is the pacing mode indicated for this patient?
 - a. DDD
 - b. VVI
 - c. DVI
 - d. VAT

2. A S4 heart sound is expected in which of the following?
 - a. Pericarditis
 - b. Left ventricular failure
 - c. Ventricular hypertrophy
 - d. Bundle branch block

3. A patient with heart failure reports a dry, hacking cough. Her current medications include captopril (Capoten) 50 mg twice a day, furosemide (Lasix) 40 mg twice a day, spironolactone (Aldactone) 25 mg daily, and warfarin (Coumadin) 2.5 mg daily. Which change to the medication regimen should the nurse anticipate?
 - a. Discontinue captopril, add losartan (Cozaar) 50 mg daily
 - b. Increase furosemide to 60 mg twice daily, discontinue captopril
 - c. Decrease furosemide to once daily, add losartan (Cozaar) 50 mg daily
 - d. Remove spironolactone, decrease warfarin to 2 mg daily

4. Common clinical manifestations of cardiogenic shock in the adult patient include:
 - a. Decreased systemic vascular resistance
 - b. Decreased pulmonary artery occlusive pressure
 - c. Expiratory wheezes
 - d. Cool, pale, moist skin

5. Your patient is recovering from a myocardial infarction, and you now suspect he is experiencing acute mitral valve regurgitation. Which of the following findings are supportive of that diagnosis?
 - a. Sudden increase in right atrial diastolic pressure
 - b. Sudden decrease in left ventricular diastolic pressure
 - c. Sudden increase in left atrial diastolic pressure
 - d. Sudden increase in right ventricular diastolic pressure

6. A patient recently admitted with congestive heart failure is being treated with loop diuretics. What signs of hypokalemia would be evident on the ECG?
 - a. Tachycardia
 - b. Peaked T waves
 - c. U waves
 - d. Widened QRS
7. Ibutilide (Corvert) 1 mg IV is ordered to be administered over 10 minutes for a patient in rapid atrial fibrillation. You know you must discontinue the Ibutilide for which of the following reasons?
 - a. Prolonged PR interval
 - b. Development of PJs
 - c. Narrowing QRS
 - d. Prolonged QT interval
8. The nurse is working with a nursing student in the care of a patient, post-open-heart surgery. Which of the following statements by the student nurse indicates their understanding of the risk atrial fibrillation poses to the patient?
 - a. Lung collapse can occur because of a decreased pulmonary artery occlusive pressure
 - b. They can develop refractory hypoxemia secondary to a rapid ventricular rate
 - c. They may develop deep vein thrombosis due to a weak, thready pulse
 - d. There is a decreased cardiac output because of the loss of atrial kick
9. A 62-year-old woman develops heart failure after having a STEMI. Her cardiac ECHO reveals an ejection fraction of 32%. You understand administering which class of drugs has been proven to decrease mortality and slow cardiac remodeling?
 - a. Alpha blockers
 - b. Calcium channel blockers
 - c. ACE inhibitors
 - d. Digoxin
10. Upon performing your assessment from an adult patient returning from the OR, you detect muffled heart sounds and jugular venous distention. You notice pulsus paradoxus in the arterial waveform on the monitor. Which of the following finding is consistent with pulsus paradoxus?
 - a. Increase in SBP > 10 mmHg during expiration
 - b. Decrease in SBP >10 mmHg during inspiration
 - c. Increase in SBP <10 mmHg during inspiration
 - d. Decrease in SBP <10 mmHg during expiration

Resources:

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