

SELF ASSESSMENT – MODULE D: CHF & PULMONARY EDEMA

- Which pressure tends to push fluid out of the capillary?
 - hydrostatic
 - oncotic
- What is the normal hydrostatic pressure in the pulmonary capillaries? **12 mm Hg**
- What is the normal oncotic pressure in the pulmonary capillaries? **25 mm Hg**
- What determines the amount of oncotic pressure in the pulmonary capillaries?
PLASMA PROTEINS (ALBUMIN & GLOBULIN)
- Differentiate between the chest x-ray findings you would see in cardiogenic pulmonary edema and non-cardiogenic pulmonary edema
 - Cardiogenic: **CARDIOMEGALY, PLEURAL EFFUSIONS, KERLEY B LINES, CARDIOTHORACIC RATIO >50%.**
 - Non-cardiogenic: **NO CARDIAC ENLARGEMENT, NO BILATERAL PLEURAL EFFUSIONS, FLUFFY DENSITIES THAT ARE MORE DENSE NEAR HILUM, RADIOPAQUE (WHITE OR RADIODENSE, CARDIOTHORACIC RATIO IS NORMAL 50% OR LESS, AND NO ENGORGED BLOOD VESSELS NEAR THE APEX OF THE LUNGS.**
- If pulmonary edema is caused from low colloidal osmotic pressure, treatment would be
 - Inotropic agents
 - Albumin
 - ACE inhibitors
 - β_2 agonists
 - CPT
- Treatment of acute CHF includes all the following **EXCEPT**:
 - ACE inhibitors
 - Digitalis
 - Diuretics
 - 100% oxygen
 - Tobramycin
- What is often the first sign of CHF? **DYSPNEA ON EXERTION**

9. What type of pleural effusion is seen in pulmonary edema caused from left heart failure
- A. **Transudate**
 - B. Exudate
10. CHF is the same thing as a myocardial infarction (heart attack)
- A. True
 - B. **False**
11. Which of the following cause CHF?
- A. Myocardial Infarction
 - B. Aortic Stenosis
 - C. Hypertension
 - D. Congenital Heart Disease
 - E. Renal failure
 - F. **All the above**
12. When the juxtamedullary cells in the kidney sense a low blood pressure, renin is produced in an attempt to increase angiotensin II. What does angiotensin II do?
ANGIOTENSIN II CAUSES VASOCONSTRICTION
13. What does aldosterone do? **DON'T WORRY ABOUT THIS FOR NOW. WE'LL COVER IT IN THE FALL.**
14. Why are ACE inhibitors used to treat CHF? **PREVENT CONVERSION OF ANGIOTENSIN I TO ANGIOTENSIN II AND THEREFORE REDUCES HYPERTENSION.**
15. Given the normal values for the following hemodynamic parameters:
- A. CVP **2 - 6 mm Hg**
 - B. PAP **25/8 mm Hg**
 - C. Mean PAP **14 - 15 mm Hg**
 - D. PCWP **4 - 12 mm Hg**
 - E. CO **4 - 8 L/min**
 - F. CI **2.5 - 3.5 L/min**
 - G. Ejection Fraction **60 - 75%**
 - H. Cardiac Output = **SV x HR**
 - I. Stroke Volume = **60 - 130 mL/beat**

16. List the 5 mechanisms causing pulmonary edema
- A. **INCREASED HYDROSTATIC PRESSURE.**
 - B. **DECREASED ONCOTIC PRESSURE.**
 - C. **DESTRUCTION OF ALVEOLAR-CAPILLARY MEMBRANE WITH ALTERED MEMBRANE PERMEABILITY. THIS RESULTS FROM INCREASED CAPILLARY PERMEABILITY**
 - D. **DECREASED LYMPHATIC DRAINAGE. THIS RESULTS IN FLUID POOLING IN THE INTERSTITIAL SPACE AND ULTIMATELY THE ALVEOLI.**
 - E. **DECOMPRESSION PULMONARY EDEMA.**
17. Low protein levels in the plasma are often caused from **MALNUTRITION**.
18. Which hemodynamic parameter is used to differentiate cardiogenic from non-cardiogenic pulmonary edema
- A. CVP
 - B. PAP
 - C. MPAP
 - D. **PCWP**
 - E. MAP
19. The treatment for CHF includes
- A. **OXYGEN (100% OXYGEN VIA NON-REBREATHING MASK)**
 - B. **SEMI-FOWLERS POSITION**
 - C. **MORPHINE**
 - D. **POSITIVE PRESSURE VENTILATION (IF INDICATED BY ABG)**
 - E. **DIURETICS SUCH AS FUROSEMIDE (LASIX)**
 - F. **ACE INHIBITORS (ANGIOTENSIN-CONVERTING ENZYME)**
 - G. **INOTROPIC SUPPORT**
 - H. **IF HYPERTENSION IS PRESENT, GIVEN A VASODILATOR SUCH AS NITROPRUSSIDE OR NITROGLYCERINE**
 - I. **KCL**
 - J. **RESTRICT SODIUM AND WATER INTAKE**
 - K. **IF CHF IS FROM CAD, CONSIDER ANGIOPLASTY OR CORONARY ARTERY BYPASS GRAFT SURGERY.**
 - L. **MONITOR ALBUMIN (PROTEIN) LEVELS. LOW LEVELS CAN CONTRIBUTE TO PULMONARY EDEMA.**
 - M. **ROTATING TOURNIQUETS (RARELY USED)**
 - N. **PHLEBOTOMY (RARELY USED)**
 - O. **ETHYL ALCOHOL AEROSOL TREATMENTS**
 - P. **CARDIAC REHABILITATION**
 - Q. **HEART TRANSPLANTATION**
20. How should a patient in acute CHF be positioned? **HIGH FOWLERS**