SELF ASSESSMENT – MODULE D: CHF & PULMONARY EDEMA

1. Which pressure tends to push fluid out of the capillary?
   A. hydrostatic
   B. oncotic

2. What is the normal hydrostatic pressure in the pulmonary capillaries? **12 mm Hg**

3. What is the normal oncotic pressure in the pulmonary capillaries? **25 mm Hg**

4. What determines the amount of oncotic pressure in the pulmonary capillaries? **PLASMA PROTEINS (ALBUMIN & GLOBULIN)**

5. Differentiate between the chest x-ray findings you would see in cardiogenic pulmonary edema and non-cardiogenic pulmonary edema
   A. Cardiogenic: **CARDIOMEGALY, PLEURAL EFFUSIONS, KERLEY B LINES, CARDIOTHORACIC RATIO >50%**.
   B. 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**.

6. If pulmonary edema is caused from low colloidal osmotic pressure, treatment would be
   A. Inotropic agents
   B. **Albumin**
   C. ACE inhibitors
   D. β2 agonists
   E. CPT

7. Treatment of acute CHF includes all the following **EXCEPT**:
   A. ACE inhibitors
   B. Digitalis
   C. Diuretics
   D. 100% oxygen
   E. **Tobramycin**

8. 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 ANGIOTENSION I TO ANGIOTENSION 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-REBREATHER 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**