

EMCP 501: Cardiovascular and Hematologic Emergencies

Cardiovascular Objectives

At the end of the course the learner will integrate material covered in online lectures, reading assignments, and vignettes and apply this knowledge to clinical problem solving. Specifically, the learner should be able to:

1. Outline the indications for emergent cardiac pacing
2. Describe the latest ACLS recommendations for a pulseless arrest.
3. Describe the range of acute coronary syndromes including stable angina, unstable angina, non ST segment elevation MI, and ST segment elevation MI.
4. Describe the suggested treatment of unstable angina.
5. Describe the suggested treatment of NSTEMI.
6. Describe the suggested treatment options for STEMI including: glycoprotein IIb/IIIa inhibitors, clopidogrel, thrombolytics, and primary cardiac catheterization.
7. Define the EKG findings in acute MI.
8. Describe the patient populations that are at risk for atypical presentations of acute coronary syndromes.
9. Compare and contrast high output and low output cardiac failure.
10. Recognize the following types of cardiac dysrhythmias as well as their treatments: ventricular, supraventricular, and disorders of conduction.
11. Describe some of the historical characteristics that make syncope more likely to be serious in nature.
12. Describe the San Francisco syncope rules.
13. Differentiate when one should defibrillate versus cardiovert a patient with a dysrhythmia.
14. List the scenarios for which one must consider prophylactic antibiotic administration to a patient with a valve disorder.
15. Describe the pathophysiology of mitral valve prolapse and its clinical consequences.
16. Describe the clinical presentations of both stenosis and regurgitation of the mitral and aortic valves.
17. Describe the risk factors, clinical features, diagnostic evaluation, and treatment of endocarditis.
18. Describe some of the complications that can be seen with prosthetic heart valves and the considerations when a patient with such a valve presents with a bleeding problem.
19. Describe a "tet spell" and how it is treated.
20. Describe the clinical significance of a patent foramen ovale.
21. Define cor pulmonale.
22. Describe the ED treatment options for both mild and severe decompensated heart failure.
23. Define how laboratory testing may aid in the diagnosis of decompensated heart failure.
24. Describe the presentation, diagnosis, and treatment of myocarditis and pericarditis.
25. Describe some of the physiologic changes that take place after a cardiac transplant.
26. Describe some of the complications that may be seen after a cardiac transplant.

27. Compare and contrast the clinical presentation, ED treatment, and disposition of patients that present with hypertensive urgency vs. hypertensive emergency.
28. List the risk factors, clinical presentation, diagnostic evaluation, and treatment for aortic aneurysm.
29. Define the risk factors for aortic dissection, how a patient may present, and the appropriate ED work up and treatment.
30. Describe some of the risk factors for both arterial and venous thromboembolic disease.
31. Describe when one should suspect an acute arterial insufficiency and some of the options for diagnostic evaluation in the ED.
32. Describe the presentation, diagnosis, and treatment options for deep venous thrombus.
33. Define the typical and atypical presentations for pulmonary embolism.
34. Describe diagnostic options for suspected pulmonary embolism as well as their sensitivity and specificity.
35. List the treatment options for pulmonary embolism
36. Describe some presentations for hypertrophic cardiomyopathy and describe the murmur associated with this disease.
37. Define some risk factors for dilated cardiomyopathy and how a patient with this disease may present to the ED.
38. Define the patient at risk for ventricular aneurysm and how it is diagnosed.
39. Describe the presentation and treatment of pericardial effusion and tamponade.

Hematologic Objectives

At the end of the course the learner will integrate material covered in online lectures, reading assignments, and vignettes and apply this knowledge to clinical problem solving. Specifically, the learner should be able to:

1. Examine the differential diagnosis of anemia and describe how to distinguish each type based on analysis of the complete blood count (CBC).
2. Describe the ED management of the bleeding patient. Summarize the indications and contraindications for blood product administration including:
 - Packed red blood cells
 - Fresh frozen plasma
 - Cryoprecipitate
 - Platelets
 - Specific clotting factors (e.g., Factor VII)
3. Explain the physiology of the coagulation cascade, and how the PT/PTT are utilized in assessing its function.
4. Differentiate the clinical presentation, diagnostic evaluation, and treatment of patients that present with acquired platelet defects as a result of:
 - Idiopathic thrombocytopenia purpura (ITP)
 - Thrombotic thrombocytopenia purpura (TTP)
 - Hemolytic uremic syndrome (HUS)
 - Disseminated intravascular coagulation (DIC)

- HELLP syndrome
- 5. Describe the mechanism of impaired hemostasis in the setting of liver disease, renal disease, and HIV.
- 6. Describe the ED treatment of congenital bleeding disorders including, von Willebrand disease and the hemophilias
- 7. Explain the pathophysiology and treatment of sickle cell anemia and its potential complications including: vasoocclusive pain crisis, acute chest syndrome, splenic sequestration, aplastic crisis, and stroke.
- 8. Describe the indications, contraindications, and potential side effects of the following medications
 - Anticoagulants (warfarin, heparin, low-molecular weight heparin, direct thrombin inhibitors)
 - Antiplatelet agents (aspirin, NSAIDs, clopidogrel, glycoprotein IIb-IIIa inhibitors)
 - Fibrinolytic agents (alteplase, reteplase, tenecteplase)