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Course Outline for EMS 55

EMT-P CARDIAC AND RESP SYSTEMS

Effective: Fall 2010

I. CATALOG DESCRIPTION:
EMS 55 — EMT-P CARDIAC AND RESP SYSTEMS — 4.00 units

Overview of prehospital evaluation and management of patients experiencing cardiac and respiratory emergencies, including monitoring and interpretation of ECG's. Comprehensive treatment through the use of advanced airway management, cardiac pharmacology, rapid defibrillation, and utilization of cardiac monitoring in the clinical setting. Supervised clinical sessions at a hospital emergency department, labor and delivery suite, pediatric clinic, to include exposure to emergency, cardiac, surgical, obstetric, and pediatric patients with a clinical preceptor. Prerequisite: Emergency Medical Services 54 (completed with a grade of “C” or higher). 3 hours lecture, 3 hours laboratory.

3.00 Units Lecture 1.00 Units Lab

Prerequisite
EMS 54 - EMT-P ABD and Neuro Systems
with a minimum grade of C

Grading Methods:
Letter Grade

Discipline:

	MIN
Lecture Hours:	54.00
Lab Hours:	54.00
Total Hours:	108.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. EMS54
1. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of the following topics: emergent disease conditions of the cerebral circulation, Seizure disorders, and headache
2. demonstrate knowledge of the following topics: Dementia, neoplasms, demyelinating disorders, Parkinson’s disease, Cranial nerve disorders, Movement disorders, Neurologic inflammation/infection, Spinal cord compression, Hydrocephalus, Wernicke’s encephalopathy
3. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of the following topics: Acute and chronic gastrointestinal hemorrhage, Liver disorders, Peritonitis, Ulcerative diseases
4. differentiate the symptoms and treatment plans of the following topics Irritable; bowel syndrome, Inflammatory disorders, Pancreatitis, Bowel obstruction, Hernias, Infectious disorders, Gall bladder and biliary tract disorders
5. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of diabetic emergencies
6. differentiate the pathology and treatment of the following topics: Adrenal disease, Pituitary and thyroid
7. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of Sickle cell disease
8. demonstrate knowledge of the following topics: Blood transfusion complications, Haemostatic disorders, Lymphomas, Red blood cell disorders, White blood cell disorders
9. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of acute and chronic renal failure
10. describe the process of dialysis
11. demonstrate knowledge of: Acid base disturbances, fluid and electrolyte fluctuations in the renal illness patient, infection, and genital tract conditions of the male and female

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. formulate a treatment plan for managing cardiac arrest and peri-arrest states
B. demonstrate knowledge of the underlying causes and pathophysiology of shock, respiratory failure or arrest with an emphasis on early intervention to prevent arrest

C. summarize the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, and prognosis of the following topics: Acute coronary syndrome, including Angina pectoris, Myocardial infarction, Heart failure, Non-traumatic cardiac tamponade, Hypertensive emergencies, Cardiogenic shock, Vascular disorders including Abdominal aortic aneurysm, Arterial occlusion, Venous thrombosis • Aortic aneurysm/dissection, Thromboembolism, Cardiac rhythm disturbances
D. formulate treatment plans for the following topics: Acute coronary syndrome, including Angina pectoris, Myocardial infarction, Heart failure, Non-traumatic cardiac tamponade, Hypertensive emergencies, Cardiogenic shock, Vascular disorders including Abdominal aortic aneurysm, Arterial occlusion, Venous thrombosis, Aortic aneurysm/dissection,, Thromboembolism, Cardiac rhythm disturbances
E. differentiate the physiology and pathophysiology of infectious diseases of the heart, and congenital abnormalities
F. discuss the underlying anatomy, physiology, pathophysiology, assessment, and management of: Epiglottitis, Spontaneous pneumothorax, Pulmonary edema, Asthma, Chronic obstructive pulmonary disease, Environmental/industrial exposure, Toxic gas, Pertussis, Cystic fibrosis, Pulmonary embolism
G. discuss the underlying anatomy, physiology, pathophysiology, assessment, and management of respiratory infections, both viral and bacterial
H. demonstrate knowledge of respiratory neoplasm and cystic fibrosis
I. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common and major diseases of the eyes, ears, nose, and throat
J. discuss the underlying anatomy, physiology, epidemiology, pathophysiology, psychosocial impact, presentations, prognosis, and management of common or major non-traumatic musculoskeletal disorders
K. demonstrate knowledge of the following conditions: Disorders of the spine, Joint abnormalities, Muscle abnormalities
L. perform the following procedures under the guidance of a clinical preceptor Intraosseous insertion of an IO needle, enteral and parenteral administration of approved prescription medications, Access indwelling catheters and implanted central IV ports, administer medications by IV infusion, Maintain infusion of blood or blood products, perform blood sampling, thrombolytic initiation, administer physician approved medications
M. identify assessment findings in a patient presentation with principles of epidemiology and pathophysiology to formulate a field impression and implement a treatment plan for a patient with a cardiovascular complaint

V. CONTENT:
A. Anatomy of the Cardiovascular System
    1. Cardiac output
B. Electrophysiology
    1. Characteristics of myocardial cells
    2. Electrical potential
    3. Autonomic nervous system relationship to cardiovascular system
C. Epidemiology
    1. Incidence
    2. Morbidity/mortality
    3. Risk factors
    4. Possible contributing risks
    5. Prevention strategies
D. Primary survey for cardiovascular assessment
    1. Level of responsiveness
    2. Airway
    3. Breathing
    4. Circulation
E. History and physical/ SAMPLE format
    1. Chief complaint
    2. Pain
    3. Dyspnea
    4. Cough
    5. Related signs and symptoms
    6. Past medical history
F. Secondary survey for cardiovascular assessment
    1. Inspection
    2. Auscultation
    3. Palpation
G. Electrocardiographic (ECG) monitoring
    1. Electrophysiology and wave forms
    2. Leads and electrodes
    3. Standardization
    4. Wave form analysis
    5. Lead systems and heart surfaces
    6. Cardiac arrhythmias
H. Management of the patient with an arrhythmia
    1. Assessment
    2. Pharmacological interventions
    3. Electrical interventions
    4. Transport
I. Acute coronary syndrome
    1. Epidemiology
    2. Precipitating causes
    3. Morbidity/ mortality
    4. Primary survey findings
    5. History of the present illness/SAMPLE history
    6. Secondary survey findings
    7. Management
    8. Support and communications strategies
J. Acute myocardial infarction/Angina
    1. Epidemiology
    2. Precipitating causes (as with angina)
    3. Morbidity/ mortality
    4. Primary survey findings
    5. History of the present illness/SAMPLE history
    6. Management
K. Heart failure
    1. Epidemiology
    2. Precipitating causes
    3. Related terminology
    4. Morbidity/ mortality

5. Primary survey
6. History of the present illness/SAMPLE history
7. Secondary survey findings
8. Management
9. Support and communications strategies

L. Non-Traumatic Cardiac tamponade
1. Pathophysiology
2. Precipitating causes
3. Morbidity/ mortality
4. Primary survey
5. History of the present illness/SAMPLE history (consider precipitating causes listed above)
6. Secondary survey
7. Management
8. Support and communications strategies

M. Hypertensive emergencies
1. Epidemiology
2. Precipitating causes
3. Morbidity/ mortality
4. Primary examination
5. History of the present illness/SAMPLE history (consider precipitating causes listed above)
6. Management
7. Support and communications strategies

N. Cardiogenic shock
1. Pathophysiology
2. Precipitating causes
3. Primary survey
4. History of the present illness/SAMPLE history (consider precipitating causes listed above)
5. Secondary survey
6. Management
7. Support and communications strategies

O. Cardiac arrest
1. Pathophysiology
2. Precipitating causes
3. Primary survey critical findings
4. History of the present illness/SAMPLE history (consider precipitating causes listed above)
5. Management
6. Support and communications strategies
7. Termination of resuscitation efforts

P. Vascular disorders
1. Epidemiology
2. Morbidity/ mortality
3. Primary survey
4. History of the present illness/SAMPLE history (consider precipitating causes listed above)
5. Secondary survey
6. Management
7. Support and communications strategies

Q. Aortic Aneurysm/Dissection
1. Thoracic
2. Abdominal

R. Thromboembolism
1. Arterial Occlusion
2. Venous Thrombosis

S. Congenital Heart Disease
1. Pulmonary Stenosis
2. Septal Defects
3. Patent Ductus Arteriosus

T. Valvular Heart Disease
1. Stenosis
2. Regurgitation

U. Coronary Artery Disease
1. Atherosclerosis
2. Intravascular Lesion

V. Infectious Diseases of the Heart
1. Result from intravascular contamination by pathogen
2. Damages heart valves
3. Damages heart muscle
4. Embolizes

W. Cardiomyopathy
1. Dilated
2. Hypertrophic

X. Specific Hypertensive Emergencies
1. Accelerated and Malignant Hypertension
2. Hypertensive Encephalopathy
3. Intracranial Hemorrhage
4. Acute Left Ventricular Failure
5. Acute Cardiac Ischemia
6. Acute Aortic Dissection
7. Eclampsia

Y. Infectious Diseases of the Heart
1. Epidemiology
2. Pathophysiology
3. Specific Disease
4. Assessment
5. Management (refer to ILCOR consensus treatment)
6. Consider age-related variations for pediatric and geriatric patients

A@. Congenital Abnormalities and Age-Related Variations
1. Epidemiology
2. Pathophysiology
3. Specific Diseases
4. Assessment

5. Management (refer to ILCOR consensus treatment)

AA. Integration
1. Apply pathophysiological principles to the assessment of a patient with cardiovascular disease
2. Formulation of field impression; decisions based on:
3. Develop and execute a patient management plan based on field impression

VI. METHODS OF INSTRUCTION:

A. **Lecture** -
B. **Discussion** - Group Discussion
C. **Lab** - Skills Laboratory
D. **Audio-visual Activity** - Selected Video and AV Aids
E. Preceptor monitored medical procedure training in a clinical settings
F. Oral and written reports
G. Reading Assignments
H. Learning Resource Center use
I. Simulated problem solving

VII. TYPICAL ASSIGNMENTS:

A. Complete workbook exercises after completing lecture readings.
B. Present simulated patient case history reports.
C. Prepare a class presentation on assigned lecture topics related to course.

VIII. EVALUATION:

A. **Methods**

1. Other:
   a. Multiple Choice Examinations, including a Midterm and Final Examination
   b. Short Essay Examinations
   c. Midterm Examination
   d. Final Examination
   e. Oral Presentations
   f. Skills Laboratory Evaluation using standardized NREMT scoring sheets

B. **Frequency**

1. Recommend weekly examinations
2. Homework assigned for each topic covered
3. Midterm and Final Examination at end of Course

IX. TYPICAL TEXTS:

1. Bryan E. Bledsoe et. al. *Paramedic Care; Principles & Practice, Vol. 1-5.* 3rd ed., Brady-Prentice Hall Health, 2008.
2. Bryan E. Bledsoe et. al. *Student Workbook for Paramedic Care; Principles & Practice, Vol. 1-5.* 3rd ed., Brady-Prentice Hall Health, 2008.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Stethoscope
B. Penlight
C. Clinical Rotation garment approved by Clinical site