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State Board of Emergency Medical, Fire,
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Date: January 28, 2010

To: EMS Instructors

From: EMS Testing Committee

RE: Recommendations and Key Concepts for Cardiology Instruction

Cardiovascular diseases continue to be the leading cause of death in the United States and accounts for a large volume of EMS runs annually. The cardiology section of the paramedic curriculum is one of the more difficult and challenging to master; nevertheless, its high importance to the student, field provider, and the public cannot be overstated. Thus, it is imperative to assist programs throughout the state to enhance their instructional capabilities.

The EMS Testing Committee recommended that an Ad-Hoc Committee be formed to review and make recommendations to enhance the learning and retention of cardiology material. The committee has developed the attached series of recommendations and key concepts.

After reviewing the enclosed material, should you have any questions, please contact me at 614-387-0648 or via email at lmirarchi@dps.state.oh.us.

Respectfully,
Linda Mirarchi, PhD.
Division of EMS Education Coordinator

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Reviewed~no changes 12/2013

Recommendations:

1. Supplemental texts must be incorporated

- √ Over and above main text (i.e. Mosby/Brady, Jones/Bartlett, McGraw Hill)
 - i. A & P (A text solely devoted to anatomy and physiology of the human body)
 - ii. Arrhythmia (A text that contains practice rhythm strips)
 - iii. Pharmacology text (A text that lists the more commonly used cardiovascular drugs and other medications.)
 - iv. ACLS material or equivalent

Rationale:

Textbooks may vary in their breadth and depth of coverage of cardiology material; therefore, supplemental resources should be utilized.

2. Testing material

- √ The program faculty, staff, and/or presenter should generate the majority of testing materials.

Rationale:

Commercially prepared test bank questions only reflect the information contained in that individual text and not the overall cardiovascular material. Additionally commercially prepared test banks may be difficult to secure may be unreliable and may not reflect the question format seen on state certification exams.

3. Introduction to pharmacology

- √ Introduction to general pharmacology should precede the cardiology/ACLS sections of the program.
- √ An introduction to cardiac specific pharmacology should also precede the cardiology/ACLS sections of the program.

Rationale:

A working knowledge of the most commonly used pharmacologic agents is essential for managing acute coronary syndromes. Attempting to teach both cardiology and pharmacology concurrently can overwhelm the student.

4. Cardiology core content

- √ Core content of the cardiology section should be taught by the midpoint of the program.

Rationale:

Provides opportunity to utilize knowledge in the lab and clinical area over a large portion of the program.

! This section should be presented as early in the program as possible.

5. **American Heart Association ACLS provider course**

- √ Successful completion of an American Heart Association ACLS provider course should occur prior to graduation.

Rationale:

AHA is currently the national standard for emergency cardiac care and students must know and demonstrate competency.

6. **Demonstration of knowledge and skills**

- √ Augment learning through practice encounters and demonstrate knowledge and skill retention through practical and skill exams prior to clinical experience.

Rationale:

Clinical experience is used to enhance the knowledge and skills taught. Clinical experience is not meant as a substitute for attaining didactic, psychomotor and affective skills competency in the classroom and practical lab setting.

7. **Remediation**

- √ Remediation should be provided when needed to assure student competency.

Rationale:

To ensure students meet minimum standards despite varying strengths, weaknesses, and learning styles.

8. **Reinforcement and reevaluation**

- √ Reinforcement and reevaluation of cardiology *must* occur on a regular basis throughout the course.

Rationale:

The cardiology section is one of the more complex and extensive components of the program. Successful assimilation of the concepts contained therein serves as the foundation for the study of multiple medical disorders. Cardiology topics should be integrated with other areas of study throughout the course (i.e. stroke, diabetes, pulmonary, trauma, etc.).

9. **Patient encounters**

- √ In areas where the patient population is limited, utilization of case-based (problem-based) scenarios should be incorporated.

Rationale:

Although live patient contacts offer far better learning opportunities, some patient scenarios occur infrequently and must be substituted using case-based (problem-based) scenarios (i.e. cardiogenic shock, AAA, transcutaneous pacing, cardioversion, and others).

10. Contemporary knowledge

- √ Maintain contemporary knowledge of current terminology, pathophysiology, and management of acute coronary syndromes and other cardiac events.

Rationale:

As with any medical science, treatment modalities, pharmacological interventions and terminology continually evolve with the advent of new research findings (i.e. thrombolytics vs. fibrinolytic agents, amiodarone vs. lidocaine, monophasic vs. biphasic defibrillation, ACS vs. AMI).

11. Program Director's responsibility

- √ To ensure their program covers the proper cardiology material, regardless of who teaches the cardiology section of the program.

Rationale:

The program director is responsible for assuring the competence and adherence of the presenter to relevant material.

12. Student/Instructor ratio

- √ During complex cognitive and psychomotor activities, the committee recommends a student to instruction ratio of 4:1.

Rationale:

Affords the instructor better assessment and evaluation of individual student performance during complex skill sessions.

KEY CONCEPTS:

1. Remember the material is college level reading material.
2. Instructors are encouraged to read additional material on the sub-section being taught.
3. Attempt to correlate didactic information with clinical and practical sessions.
4. As the material contained in Cardiology is complex yet critical, the instructor must enhance the student's educational experience by utilizing various teaching techniques and materials, including but not limited to 3-D models, patient simulators, and small group didactic instruction. Additionally, a student/instructor ration of 4:1 provides a more optimal learning environment for each student.
5. Dosages listed in pharmacology books are often author specific. Regardless of the pharmacology book chosen, the dosages taught must follow the American Heart Association standard.
6. Instructors should generate their own tests to adequately assess students' knowledge of the content they have covered rather than solely relying upon commercially produced test banks.