Tennessee CTE

Cardiovascular Services

Career Planning

1 **Research careers within cardiovascular and pulmonary sciences and explain in a graphic illustration or informational artifact** the educational/credentialing requirements, scope of practice, as well as state and national compliance guidelines required of cardiovascular health care professionals.** 1

2 **Analyze the range of skills, competencies, and professional traits (such as leadership, time management, and ethical responsibility) required for careers in cardiovascular or pulmonary sciences. Using real-time and projected labor market data, identify local and national employment opportunities and determine areas of growth. Complete a job application, resume, and cover letter for one of the jobs located in the search.** 2

Legalities and Ethical Issues

3 **Summarize the Health Insurance Portability and Accountability Act (HIPAA) and explain procedure and guidelines concerning receiving and verifying physician orders, identifying the patient/client, and obtaining patient's consent to perform procedures. Identify the procedures that require written permission and those that require only verbal consent. Roleplay these procedures in a classroom and/or clinical setting. Explain, using domain-specific language and accurate definitions of legal concepts, how the content of these legal documents impacts patients' rights for all aspects of care.** 3

4 **Compare and contrast the costs of preventive medical procedures versus diagnostic medical procedures related to the cardiovascular and pulmonary system. Use information found in news media, professional journals, and trade magazines to help determine if preventive procedures would increase or decrease health care cost as it relates to heart health.** 4

Anatomy and Physiology

5 **Relate the gross and cellular structure and function of the cardiovascular and autonomic systems to the following areas.** 5

- a Electrophysiology of the heart, including definitions of waveforms 5.A
- b Control mechanisms and cardiac cycle with normal values (CET) 5.B
- c Size, location, layers, chambers, valves, pressures, and blood flow of heart (CET) 5.C
- d Relationship of cardiac output to heart rate and stroke volume (CET) 5.D

6 **Interpret the pathophysiology related to normal and abnormal heart sounds and breath sounds. Evaluate simulated heart sounds to identify normal heart sounds,**

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normal lung sounds, murmurs, rubs, extra heart sounds, wheezes, or other abnormal breath sounds via a mannequin or digital substitute. 6

7 **Choose a disease, disorder, or emergency situation related to the cardiac, circulatory, pulmonary, or autonomic systems drawn from news media, textbooks, professional journals, or trade magazines. Develop an oral or visual presentation interpreting the scope of the disease/disorder/emergency, basic pathophysiology, affected populations, pharmacological interventions, signs and symptoms, risk factors, existing practices that target the disease/disorder, and interventions available.** 7

8 **Formulate a written and digital health education project to inform an adult and/or geriatric audience about the negative effects of complications such as electrolyte imbalance, obesity, hypertension, diabetes, or renal impairment on the heart, circulatory, and pulmonary systems.** 8

Diagnostics and Procedures

9 **Perform the following duties and tasks related to pre-procedural activity: (CET)** 9

- a Perform universal precautions (e.g., hand washing, Personal Protective Equipment) 9.A
- b Transport the patient 9.B
- c Prepare the patient (shaving, cleaning skin, etc., should be simulated on mannequin) 9.C
- d Collect patient information 9.D
- e Enter information into Electrocardiogram (ECG) machine 9.E
- f Identify proper landmarks on mannequin 9.F
- g Maintain patient safety throughout the pre-procedural process 9.G
- h Vital sign assessment 9.H
- i Pulse oximeter 9.I

10 **Differentiate between bipolar, unipolar, and precordial leads. Relate their importance in performing an ECG test correctly. Include the concept of Einthoven's Triangle in the explanation.** 10

11 **Compare and contrast the single- and three-channel ECG machines. Demonstrate the ability to define the purpose of the equipment, and explain indications for use, expected outcomes, advantages, disadvantages, and limitations of each.** 11

12 **Summarize the history of the ECG machine including aspects of industry standardization and advances in technology. Use a timeline or other graphic to illustrate the major developments.** 12

13 **Understand principles of and successfully perform skills related to performing a resting ECG (12 lead, 15 lead, etc.), incorporating rubrics from textbooks or clinical standards of practice for the following: (CET)** 13

- a Gather supplies and equipment 13.A

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b Educate patient on procedure expectations 13.B

c Apply electrodes and leads to patient 13.C

d Confirm equipment 13.D

e Perform standard ECG 13.E

14 Obtain ECG tracing strips and perform rhythm analysis, including the following: (CET) 14

a Analyze ECG tracing for presence of P, Q, R, S, and T waves, and heart rate calculation. 14.A

b Identify ECG tracings indicative of sinus, junctional, atrial, ventricular, atrioventricular, hypertrophy, chamber enlargement, and pacemaker rhythms. Include intraventricular conduction and myocardial perfusion tracings. 14.B

c Identify electrical interference and somatic tremor on an ECG tracing, as well as the steps to take to alleviate or prevent such artifacts. 14.C

d Correlate ECG finding (wavelengths, segments, intervals, etc.) with cardiac function. 14.D

e Correlate ECG morphology with anatomy and physiology. 14.E

15 Role-play explanation of the cardiovascular reflex test in a mock clinical setting. Discuss at minimum the following: overview or explanation of the test, the associated risks, patient expectations before, during, and after the test, and next steps for abnormal results. 15

16 Summarize in a written, oral, or digital presentation the scope of a typical electrocardiograph test. Draw evidence from textbooks, professional journals, and online healthcare sites (such as Cleveland Clinic, MedLine Plus, and Mayo Clinic) to produce an overview or explanation of the test, the associated risks, and patient expectations before, during, and after testing. 16

17 Construct a chart or a graph that differentiates between the various types of nuclear imaging and the radiographic cardiovascular and pulmonary test. Include within this graph or chart an overview or explanation of the test, the mechanics of the procedure, the associated risks, and patient expectations before, during and after testing. Obtain information from textbooks, professional journals, and online healthcare sites (such as Cleveland Clinic, MedLine Plus, and Mayo Clinic). 17

18 Research the types of invasive diagnostic procedures. Examples might include cardiac catheterization, carotid angiography, electrophysiological studies, intravascular ultrasound, or myocardial biopsy. Develop a patient education packet utilizing medical and non-medical terminology, including the following information: overview or explanation of the procedure, the associated risks, patient expectations before, during, and after the test, and next steps for abnormal results. 18

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	19	**Differentiate between the various types of cardiovascular ultrasound procedures. Discuss what an ultrasound can identify that other procedures might not, in addition to the risk considerations, reliability of results, and proper interpretation of an ultrasound image. Roleplay teaching another classmate about the type of procedure that has been ordered by the physician.** 19
Invasive Treatment Procedures	20	**Research treatments involving cardiac, vascular, and thoracic surgery for cardiovascular and pulmonary diseases and/or disorders. Analyze in written, oral, or digital format the implications for each, identifying trends and/or advances in available treatments over the past fifty years.** 20
	21	**Identify characteristics and/or signs and symptoms of patients experiencing cardiac and/or pulmonary complications in physician offices or emergency rooms. Create a plan of action for assessment, diagnosis, and treatment of the patient.** 21
Health Statistics	22	**The Centers for Disease Control (CDC) suggests that the number one leading cause of deaths in the United States is heart disease, according to 2012 data. Complete a short research project to identify on the local level the 1) incidence of heart disease and disorders, 2) number of associated deaths, 3) preventive measures currently being taken, and 4) available educational programs and initiatives. Document findings in an oral, digital, or visual presentation. Information can be found from organizations such as the CDC, state and county health department websites, and interviews with public health and emergency professionals.** 22
	23	**Research the Healthy People Initiative sponsored by the U.S. Food and Drug Administration (FDA). Identify the goals and objectives, established baselines, and strategies to facilitate progress toward the initiative's goals. Then, develop a marketing campaign to inform a variety of audiences about the initiative. The campaign can include a public service announcement, community awareness project, health education project, and/or public health education project shared with local schools, leaders in the community, and the general public.** 23