Tennessee CTE

Diagnostic Medicine

Career Planning and Professionalism 1	**1** Revise the career information portfolio developed in the Health Science Education course and update with more in-depth information surrounding careers in diagnostic sciences. Identify specific roles and responsibilities for each career in this field. Investigate and compare the range of skills, competencies, and professional traits required for such careers. Compare findings to current individual strengths and identify opportunities for personal development. 1.1
	2 Summarize the Health Insurance Portability and Accountability Act (HIPAA), in particular those aspects related to maintaining confidentiality, patient rights, patient safety, and other ethical/legal directives governing medical treatment. Using medical terminology and accurate definitions of legal concepts, explain how the content of these ethical/legal ramifications affects patients' rights for all aspects of care. 1.2
Technology 2	**1** Investigate and document the history of diagnostic medical imaging, medical laboratories, and other related areas of diagnostic medicine. Explain how technology, including telemedicine, is influencing the future of each. Synthesize research from professional journals and other medical or technical literature (noting the authors and their purposes) to analyze the barriers to these technologies and predict how the industry might respond. 2.1
	2 Synthesize information from professional journals and digital resources to investigate the use of robotics in healthcare other than in surgical procedures. Develop a proposal, sketch, mock press release, or similar written artifact for a new technology or an improvement to a current technology that can be used in the field of diagnostics. Detail all the specifications of the new technology, including an explanation of how the technology will be used, the projected cost-saving measures, and the most applicable professions that would use the technology. 2.2
	3 Evaluate data from research articles encompassing the reliability of home testing kits (i.e., pregnancy test) and portable diagnostic equipment (i.e., glucometers). Explain findings in an informational essay, citing at least three different peer-reviewed articles and including appropriate medical terminology. 2.3
Safety 3	**1** Obtain medical laboratory manuals from at least three different resources or physical laboratory sites. Identify the elements of containment regarding general nfection control, chemistry precautions, fire safety, chemical hazards, electrical afety, mechanical safety, general lab safety, accident exposure, and disaster

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	preparedness. Develop a written or digital lab manual for a medical laboratory at school based on findings from the research. 3.1
	2 Research the guidelines pertaining to radiation safety for staff, patients, and family who are receiving any radiological procedure. Develop an informational artifact, public service announcement, or health education presentation that instructs patients/clients on what patients should know about medical radiation safety. 3.2
	3 Explore policies and procedures related to diagnostic equipment quality control monitoring and evaluation. Synthesize information into a digital or written presentation to instruct appropriate staff on the importance of implementing quality control processes according to policy. 3.3
Infection Control/Medical Microbiology 4	1 Demonstrate mastery of concepts and skills related to asepsis, Universal Precautions, sanitation, disinfection, and sterilization for patient/client care settings in adherence to standards and guidelines from the Centers for Disease Control and Prevention (CDC) and the Occupational Safety and Health Administration (OSHA) in a lab/clinical setting. 4.1
	2 Define the term normal flora and explain how its deviation can prevent or cause a disease or disorder. Outline specific preventive measures to align to acceptable standards of care in the healthcare field. 4.2
	3 Assess the differences between healthcare-associated infections and non-healthcare- associated infections using examples drawn from mock patient documents or case studies. Support explanations with relevant surveillance statistics, preventive measures, and methodologies concerning outbreak detection, management, and education. 4.3
Diagnostic Medical Imaging 5	1 Outline the in-depth normal structure and function of the musculoskeletal, digestive, and cardio-respiratory systems, specifically as they relate to diagnostic medical imaging. Review directions, planes, and sections of the body in order to perform diagnostic imaging procedures. Summarize appropriate medical text(s) in order to list signs and symptoms of common diseases and disorders associated with each system. 5.1
	2 Distinguish between the various types of diagnostic medical imaging, citing the uses, advantages, and disadvantages of each. Develop an explanation that would be used for beginning health science students, incorporating appropriate industry and medical terminology. 5.2
	3 Distinguish between Direct Radiography and Computed Radiography, citing the benefits of each related to the effects of radiation dose and cost. Compare the benefits of image storage in Picture Archive and Communication Systems to x-ray film storage. Relate the benefits of electronic image storage to its application in telemedicine. 5.3

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4 **Research the principles of radiographic physics and explain how the concepts are applied to produce high-quality radiographic images. Discuss the following in the explanation:** 5.4

- A Properties of X-rays 5.4.A
- B Production of X-rays 5.4.B
- C The X-ray tube and other parts of an X-ray machine 5.4.C
- D Absorption, scatter, and transmission of X-rays 5.4.D

Clinical Laboratory 6

1 **Outline the in-depth normal structure and function of blood and related components. Summarize appropriate medical text(s) in order to list signs and symptoms of common blood diseases and disorders associated with each. Define the following common laboratory procedures, both normal and abnormal, and provide the reasoning for why the test should be obtained:** 6.1

- A Complete Blood Count 6.1.A
- B Complete Metabolic Panel 6.1.B
- C Fasting Lipid Panel 6.1.C
- D Hgb A1C 6.1.D

2 **Analyze the relationship of blood components to common blood diseases and disorders listing signs and symptoms associated with each. Define the following common laboratory procedures, both normal and abnormal, and provide the reasoning for why the test should be obtained:** 6.2

- A Complete Blood Count 6.2.A
- B Complete Metabolic Panel 6.2.B
- C Fasting Lipid Panel 6.2.C
- D Hgb A1C 6.2.D

3 **Develop a graphic organizer or concept map to explain the functions of the various departments of a medical laboratory, such as microbiology, chemistry, hematology, blood banking, and urology. Include types of fluid samples and test that are performed in each area with a detail of the precautions involved when handling each.** 6.3

4 **Understand principles of and successfully perform skills of a phlebotomist, incorporating rubrics from National HOSA, textbooks, or clinical standards of practice.** 6.4

- A Distinguish sites and/or veins for blood draws in all populations using the required equipment and safety precautions. 6.4.A
- B Perform collection procedures for micro-specimens and venipuncture on a mannequin using appropriate collection containers and identifying factors affecting collection/test results. 6.4.B

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C Provide guidelines for obtaining blood from neonates, pediatrics, and geriatrics. 6.4.C

D Perform skills of patient/specimen identification and transporting of specimens. 6.4.D

Ophthalmological Procedures 7

1 **Outline the in-depth normal structure and function of the eye. Summarize appropriate medical text(s) in order to list signs and symptoms of common diseases and disorders associated with each.** 7.1

2 **Summarize appropriate medical text(s) in order to compare and contrast normal versus abnormal structure and function of the eye related to common eye diseases listing signs and symptoms, and diagnostic studies for each.** 7.2

3 **Understand principles of and successfully perform skills related to basic ophthalmic examination, incorporating rubrics from textbooks or clinical standards of practice. Measure pulse and blood pressure, and conduct a history and physical, especially concerning areas related to the eye.** 7.3

4 **Research the concepts surrounding measurement of visual acuity with associated equipment, and explain corrective measures for abnormalities (i.e., surgery, glasses, or contacts). Specify what measures should be used with each abnormality.** 7.4

Cardiologic Services 8

1 **Research the educational requirements, certification, and licensures for cardiovascular technologist, diagnostic vascular technologist, electrocardiogram technician, telemetry technician, cardiac sonographers, and other related cardiovascular careers. Compare and contrast the educational requirements of each.** 8.1

2 **Investigate cardiac diagnostic procedures both in-hospital and out-patient and identify the equipment required for these services.** 8.2

3 **Create an infographic to identify gross heart anatomy and physiology and related cardiac conduction and circulatory pathways.** 8.3

4 **Assess lead placements and correlate their relationship to the conduction system through the use of a diagram or model.** 8.4

5 **Analyze the P,Q,R,S,T complex and its correlation to the cardiac cycle. Chart a mock representation of these waves on an electrocardiogram.** 8.5

6 **Analyze rhythm strips and/or 12 lead EKGs and differentiate between critical and non-critical cardiac rhythms using student created algorithms.** 8.6

7 **Assess and analyze cardiac output and tissue perfusion using capillary refill and/or pulse oximeter by assessing multiple classmates and correctly charting on low chart.** 8.7

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Diagnostic Services Terminology 9

1 **Analyze and interpret medical terminology and abbreviations related to anatomy and physiology, pathology, and diagnostic services. Demonstrate mastery of medical terminology use and accurate spelling in each area through verbal and written explanation. Demonstrate the skills involved when communicating with a patient or family member by explaining the terminology, abbreviations, and symbols in layman's terms.** 9.1