

Collaborative Healthcare Virtual Reality Modules

Made possible by the Government of Ontario through eCampus Ontario's Virtual Learning Strategy



Collaborative Healthcare Virtual Reality Modules

This project has been developed in partnership by Laurentian University School of Nursing & CROSH, Georgian College, The Michener Institute of Education and Lumeto in Virtual Reality (VR) for eCampus Ontario. Twelve synchronous, fully immersive and interactive VR learning modules have been created, peer reviewed and put through a pilot study. The modules are suited for various healthcare learners at an undergraduate, graduate and clinician level. This new approach to learning will ensure post secondary healthcare training can continue safely during pandemic restrictions, and beyond, without compromising signature features of evidence-based teaching and learning protocols. Through this work we hope to reduce the reliance on highly-trained, in-person sessions or technology on-site for live simulation training, and thereby maximize VR as an education platform to increase the portability, scalability, and standardization of scenario-based post-secondary healthcare learning.

The 12 open and flexible live, synchronous, VR scenarios available through the Lumeto platform are described below. The first six scenarios are live, the second six in transition to being live, the additional five cases are being shared as case ideas and will potentially be developed in the near future. Please refer to the flow chart on the 'eCampus_Access to VR' PPT document (**Request to Access Lumeto Platform**) for access to the Lumeto platform.

This project is committed to ensuring digital accessibility for people with disabilities. We are continually improving the user experience for everyone, and applying the relevant accessibility standards. We welcome your feedback on the accessibility of this project. Please let us know if you encounter accessibility barriers once you have accessed the Lumeto platform.

This project is made possible with funding by the Government of Ontario and through eCampusOntario's support of the Virtual Learning Strategy. To learn more about the Virtual Learning Strategy visit: <https://vls.ecampusontario.ca>.

Lesson Title: Donning and Doffing PPE

Mode: Self-Directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto in Virtual Reality for eCampus Ontario. Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Andel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners are introduced to an ante room where they learn how to properly don and doff their PPE. Learners are able to follow along a checklist and visualize their progress in a mirror. This module is also a great introduction to the fundamentals of using virtual reality controls.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice donning and doffing PPE.
- Learners will demonstrate the proper sequence for donning and safely doffing PPE.

Suitable for : Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine and allied healthcare learners.

Lesson Title: CPR Task Trainer

Mode: Self-Directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto in Virtual Reality for eCampus Ontario. Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Andel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners are presented with an African American female who has collapsed in a Recreation Room. Learners are expected to assess the patient for responsiveness, call for help, check for a carotid pulse and normal breathing. After finding the patient to be pulseless and not breathing they are prompted to begin chest compressions. The learners will have access to real-time feedback via the CPR widget. Following the scenario, learners will receive performance metric feedback and have the opportunity to repeat the experience to achieve mastery.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice responding to a patient in cardiac arrest.
- Learners will assess an unresponsive patient, identify the need for CPR and perform chest compressions.
- Learners will perform effective CPR.

Suitable for : Any healthcare learner or clinician as initial or ongoing refresher training in the basics of CPR.

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Lesson Title: CPR/AED Task Trainer

Mode: Self-Directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto in Virtual Reality for eCampus Ontario. Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Andel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners are presented with an African American female who has collapsed in a Recreation Room. Learners are expected to assess the patient for responsiveness, call for help, check for a carotid pulse and normal breathing. After finding the patient to be pulseless and not breathing they are prompted to retrieve and apply an AED, defibrillate the patient and begin chest compressions. The learners will have access to real-time feedback via the CPR widget. Following the scenario, learners will receive performance metric feedback and have the opportunity to repeat the experience to achieve mastery.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice responding to a patient in cardiac arrest.
- Improve learner confidence in identifying the need for CPR, delivering defibrillation using an AED and performing chest compressions.
- Learners will perform effective CPR.
- Learners will use an AED effectively.

Suitable for : Any healthcare learner or clinician as initial or ongoing refresher training in the basics of CPR and AED use.

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Lesson Title: Basic Patient Assessment - COVID

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto in Virtual Reality for eCampus Ontario. Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Anel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners are presented with a 52-year-old white male who has arrived at the Emergency Department by private vehicle complaining of body aches and generalized fatigue. The patient took an at home Covid test after 2 days of symptoms and it was positive. His wife is concerned that with his medical history he is at great risk and wants him to “get checked out”. The patient has been taken to an exam room and placed in a gown. Learners are expected to complete a systematic patient assessment and report their findings.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice basic patient assessment while donning and doffing PPE.
- Improve learner confidence in completing a systematic patient assessment.
- Provide an effective evaluation tool for basic patient assessment.
- Learners will don and doff PPE.
- Learners will perform a basic patient assessment.
- Learners will use therapeutic communication to guide their assessment.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine and allied healthcare learners.

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Lesson Title: ACLS: Code Blue Scenario

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Synopsis: Learners are presented with a 42-year-old white male who has been transported to the Emergency Department by EMS after experiencing mid-sternal chest pain with diaphoresis and nausea while at home. Once in the examination room, the patient becomes unresponsive and has no vital signs. Learners will be able to assign roles, communicate as a team, perform CPR, respond to lethal cardiac rhythm changes and perform safe defibrillation, and administer IV medications to resuscitate the patient.

Lesson and Learner Objectives:

- Provide a safe environment for learners to respond to a patient in cardiac arrest.
- Provide an effective evaluation tool for management of a patient in cardiac arrest.
- Learners will initiate appropriate emergency interventions for an unresponsive patient.
- Learners will demonstrate proper CPR technique, IVP drug administration and safe defibrillation practice.

Suitable for : Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education and IPE teams.

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Lesson Title: Difficult Airway Management

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto in Virtual Reality for eCampus Ontario. Authored by Andel Frazier, RN, BSN, CHSE for Lumeto. Peer reviewed by Nicole Lafreniere, MN, BScN, CHSE & Joelle Lachance, MN, BScN.

Synopsis: The learners, acting as a Rapid Response Team, are called to the ICU. The primary ICU nurse states that the patient, a 56-year-old white male currently receiving lorazepam on a CIWA scale for alcohol withdrawal, is no longer protecting his airway and may have just aspirated. If asked, he was given at least 30 mg of lorazepam already this shift. The patient has a decreased level of consciousness and serious airway compromise, requiring advanced airway management.

Lesson and Learner Objectives:

- Provide a safe environment for learners to respond to a patient with airway compromise.
- Provide an effective evaluation tool for management of a patient with airway compromise.
- Learners will gain confidence in assisting in the management of intubating a patient.
- Learners will communicate with the team effectively, using crisis resource management skills.

Suitable for : Advanced Undergraduate and PostGraduate Nursing, Advanced Undergraduate and Postgraduate Medicine, Interprofessional Education and IPE teams.

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Lesson Title: Focused Respiratory Assessment - Pneumonia

Mode: Instructor-led Training (ILT), Group Self-directed learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario. Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Anel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners will evaluate a 30-year-old Asian female patient who has presented to a clinic complaining of shortness of breath and chest pain with cough. The patient is healthy and active, she reports that she ran a half marathon yesterday and during her run she started to experience chest pain and difficulty breathing. She was forced to stop her race. She did not report her concerns to medical staff that were present at the time as she thought she was just over tired from a hard work week. Once she got home her husband urged her to get checked out. Evaluation will reveal a stable patient with signs and symptoms of pneumonia.

Lesson and Learner Objectives:

- Provide a safe environment for learners to respond to a patient with respiratory complaints.
- Provide an effective evaluation tool for management of a patient with a respiratory illness.
- Learners will demonstrate respectful and clear patient communication.
- Learners will demonstrate the collection of subjective and objective data during a focused respiratory assessment.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine.

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Lesson Title: Focused Cardiac Assessment - Stable Supraventricular Tachycardia

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario. Authored by Anel Frazier, RN, BSN, CHSE for Lumeto. Peer reviewed by Nicole Lafreniere, MN, BScN, CHSE.

Synopsis: Learners will evaluate a 22-year-old obese white male patient who has presented to a clinic complaining of severe anxiety. The patient is a senior at the local university. He reports that he woke today feeling extremely anxious. He has been “cramming” for exams and “super stressed out”, reporting several nights of poor sleep and drinking a lot of caffeine and smokeless tobacco to stay awake. Evaluation will reveal a stable patient with supraventricular tachycardia.

Lesson and Learner Objectives:

- Provide a safe environment for learners to respond to a patient with cardiac complaints.
- Provide an effective evaluation tool for management of a patient with a cardiac arrhythmia.
- Improve learner confidence in managing a patient with a cardiac arrhythmia.
- Learners will demonstrate respectful and clear patient communication.
- Learners will demonstrate the collection of subjective and objective data during a focused cardiac assessment.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine.

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Lesson Title: Hypovolemic Shock in a Postoperative Patient

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario.

Synopsis: Learners are to assess a 30-year-old male who returned to the surgical unit 6 hours ago following a right hemicolectomy for colon CA. The patient is not feeling well and complains of increased abdominal pain. Learners are expected to recognize the signs and symptoms of hypovolemic shock and intervene appropriately to minimize adverse patient outcomes and support recovery. Interventions include: assessment and interpretation of vital signs; focused neurological and abdominal assessments, assessment of postoperative equipment, activation of Rapid Response Team, effective communication with physician/team; application of oxygen therapy, therapeutic communication and teaching with the patient and family and subsequent safe administration of medication, fluid boluses and blood products.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of changes in patient status and to implement critical interventions.
- Provide an effective evaluation tool for learner management of a deteriorating postoperative patient.
- Improve learner confidence in managing a deteriorating patient.
- Learners will assess a postoperative patient and correctly prioritize findings.
- Learners will prioritize required interventions.
- Learners will communicate effectively with the patient and healthcare team.

Suitable for: Advanced Undergraduate and PostGraduate Nursing, Advanced Undergraduate and Postgraduate Medicine, Interprofessional Education and IPE teams.

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Lesson Title: Septic Shock - Urosepsis

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario.

Synopsis: Learners are presented with a 73 y/o African American female patient who arrives in the Emergency Department via EMS, with altered mental status and dehydration. The patient lives with her adult daughter, who has noticed a decline in the patient's mental status, activity level and appetite over the last 1-2 days. The patient presents in impending respiratory failure, hypoglycemia and hypotension due to septic shock from a UTI. The patient requires EGDT (Early Goal Directed Therapy) for sepsis and will not improve without management of the airway, blood glucose levels and fluid status. Scenario will end with recognition of the need for central venous access, antibiotics, vasopressors and transfer to the ICU.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of a critically ill patient.
- Provide an effective evaluation tool for learner management of an unstable patient requiring urgent airway management and cardiovascular support.
- Improve learner confidence in managing an unstable patient.
- Learners will demonstrate a systematic patient assessment.
- Learners will recognize airway compromise and poor perfusion.

Suitable for: Advanced Undergraduate and PostGraduate Nursing, Advanced Undergraduate and Postgraduate Medicine, Interprofessional Education and IPE teams.

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Lesson Title: Cardiogenic Shock - Atrial Fibrillation with Rapid Ventricular Response

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario.

Synopsis: Learners are presented with a 65-year-old male who experienced a brief and sudden onset of shortness of breath and palpitations at home today. He was admitted to the Cardiology Unit for observation and further testing. The primary nurse finds him to be short of breath, pale, and diaphoretic. The nurse will perform a brief assessment and determine the need for additional help. While awaiting, the primary RN will continue with a focused cardiac assessment.

Additional learners have been informed that they are members of a shock response team (RRT), and will be expected to receive an ISBAR report from the primary nurse, reevaluate the patient, and work as a team to complete appropriate therapeutic interventions.

Lesson and Learner Objectives:

- Provide a safe environment for learners to recognize a patient with unstable tachycardia.
- Provide an effective evaluation tool for learner management of a patient requiring urgent cardiovascular interventions.
- Improve learner confidence in managing an unstable cardiac patient.
- Learners will perform a focused cardiac assessment.
- Learners will recognize cardiac shock.
- Learners will communicate effectively with members of the healthcare team.

Suitable for: Advanced Undergraduate and PostGraduate Nursing, Advanced Undergraduate and Postgraduate Medicine, Interprofessional Education and IPE teams.

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Lesson Title: Post Resuscitation Care

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario.

Authored by Andel Frazier, RN, BSN, CHSE for Lumeto. Peer reviewed by Nicole Lafreniere, MN, BScN, CHSE.

Synopsis: Learners are presented with a 42-year-old white male who had been transported to the Emergency Department by EMS after experiencing mid-sternal chest pain with diaphoresis and nausea while at home. The patient suffered a cardiac arrest upon arrival and was resuscitated. Learners are expected to provide immediate post resuscitation care following Return of Spontaneous Circulation and identify potential causes of the cardiac arrest, and arrange for transport of the patient to an appropriate destination based upon the suspected cause of the arrest.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice immediate post resuscitation care.
- Provide an effective evaluation tool for learner management of the post resuscitation care of a patient following ROSC.
- Improve learner confidence in team-based management of an unstable patient following ROSC.
- Learners will demonstrate critical thinking and discuss the possible causes of cardiac arrest.
- Learners will arrange for patient transport.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education.

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Lesson Title: Advanced Airway Management-Intubation (to be developed)

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Georgian College, Laurentian University and Lumeto for eCampus Ontario.

Authored by Jonathan Lee, CCP(f) and Rob Theriault, CCP(f), BHSc, M.E.T. Peer reviewed by Nicole Lafreniere, MN, BScN, CHSE.

Synopsis: Learners are presented with a 52 year old male, who came into the remote nursing station 10 hours ago with a chief complaint of sudden onset headache and altered level of consciousness. The patient arrived by plane and after being seen in the ER, was sent for an urgent CT and continues to have a decreasing level of consciousness. CT scan revealed a large intracranial hemorrhage with midline shift. The decision was made to immediately admit him to the ICU. En route from radiology, the patient began to vomit.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of a patient with an uncontrolled airway and at risk for aspiration.
- Provide an effective evaluation tool for learner management of an unstable patient requiring intubation.
- Improve learner confidence in managing an unstable patient requiring intubation.
- Learners will perform accurate and timely assessments in an unstable patient requiring intubation.
- Learners will interpret clinical presentation to identify hypoxia and hypoventilation and implement priority nursing interventions.
- Learners will communicate effectively with members of the healthcare team.

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Lesson Title: Wound Care and Diabetic Education (to be developed)

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University and Lumeto for eCampus Ontario.

Authored by Nicole Lafreniere, MN, BScN, CHSE. Peer reviewed by Anel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: The learners are presented with Mrs. Elizabeth Menard, age 77, a widow, who is admitted to their unit with open sores on her right foot. She was diagnosed with Type 2 Diabetes 40 years ago. Type 2 Diabetes is present in her family history as her mother was also diagnosed with the disease. On admission, small open necrotic areas with purulent discharge were noted on the pads of her right toes. She is uncertain what day it is and why she has come to the hospital.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of a patient with poor diabetes management and need for wound care.
- Provide an effective evaluation tool for learner management of a patient with type 2 diabetes.
- Learners will perform accurate and timely assessments of a type 2 diabetic patient with foot ulcers.
- Learners will interpret clinical findings in order to identify the wound management and educational needs of the patient.
- Learners will perform appropriate nursing interventions and communicate effectively with the team.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education.

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Lesson Title: Tracheostomy Care (to be developed)

Mode: Instructor-Led Training (ILT), Group Self-directed Learning (SDL)

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Developed in partnership by Laurentian University, Lumeto and the Michener Institute for Education for eCampus Ontario.

Authored by Jordan Holmes, B.Eng., M.A., MRT(N), CHSE and Roger Chow, BSc., RT. Peer reviewed by Nicole Lafreniere, MN, BScN, CHSE and Andel Frazier, RN, BSN, CHSE for Lumeto.

Synopsis: Learners are presented with a 58 year old male with a tracheostomy for Central Sleep Apnea. He had a cold for 2 weeks and developed pneumonia. The patient will experience an obstructed airway with a tenacious mucus plug in his trach. The learner is expected to communicate with the patient, assess and intervene with airway rescue and oxygenation support.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of a patient with an obstructed airway and at risk for respiratory distress.
- Provide an effective evaluation tool for learner management of a patient with an obstructed tracheostomy.
- Improve learner confidence in managing a patient with an obstructed tracheostomy.
- Learners will perform accurate and timely assessments in a patient with an obstructed tracheostomy.
- Learners will interpret clinical presentation to identify the obstruction and secondary hypoxia and implement priority nursing interventions.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education & Respiratory Therapist Learners.

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Lesson Title: Allergic Reaction Management (to be developed)

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Synopsis: Learners are presented with a retired 72 year old female, recently widowed who lives independently in her home in Sudbury. She has returned to the emergency department with complaints of fever, swollen red laceration to her left shin that has purulent discharge. The ER doctor thought she should be admitted and a course of IV Vancomycin as an inpatient would help. He was a bit vague and rushed in his comments.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice recognition of a patient with a vancomycin allergic reaction.
- Provide an effective evaluation tool for learner management of an allergic reaction.
- Improve learner confidence in managing an allergic reaction.
- Learners will perform accurate and timely assessments in a patient who is experiencing an allergic reaction to IV vancomycin.
- Learners will interpret clinical presentations to identify the allergic reaction and implement priority nursing interventions.
- Learners will communicate effectively with members of the healthcare team.

Suitable for: Undergraduate and Postgraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education.

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Lesson Title: Cardiac and Respiratory Assessment (to be developed)

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Synopsis: Learners are presented with a female who reports that she ran a half marathon yesterday and that during her run she started to experience chest pain and a hard time breathing. She was forced to stop her race. She did not report her concerns to medical staff that were present at the time as she thought she was just over tired from a hard work week. Once she got home her husband urged her to get checked out in the Emergency Department. Learners will interpret clinical findings to present a possible suspected cause for the patient's symptoms.

Lesson and Learner Objectives:

- Provide a safe environment for learners to practice cardiac and respiratory assessments.
- Provide an effective evaluation tool for learner management of a differential diagnosis..
- Improve learner confidence in managing a differential diagnosis.
- Learners will perform accurate and timely assessments.
- Learners will interpret clinical presentations to identify possible nursing interventions.
- Learners will communicate effectively with members of the healthcare team.

Suitable for: Undergraduate and PostGraduate Nursing, Undergraduate and Postgraduate Medicine, Interprofessional Education.

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