Participant Objectives:

1. Describe the pathogenesis of Coronary Artery Disease (CAD).

2. Identify the classifications of Acute Coronary Syndrome (ACS) (stable angina, unstable angina, NSTEMI, and STEMI) and differential causes of chest pain.

3. Discuss evaluation of chest pain and equivalent myocardial ischemia symptoms:
   a. History
   b. Presentation
   c. Diagnostic tests

4. Identify signs of ischemia, injury and infarction on 12 lead ECG.

5. Identify the cardiac biomarkers and describe their use in assessment of ACS / AMI.

6. Describe the goals of therapy for a patient experiencing ACS / AMI:
   a. Myocardial oxygen supply and demand
   b. Myocardial preservation (including early reperfusion) e.g. clot busters, stent
   c. Prevention/ management of complications
   d. Secondary prevention

7. Review commonly prescribed medication for ACS/ AMI, rationale for use and precautions:
   a. Platelet Inhibitors (ASA, Plavix, Prasugrel, Ilb/Illa glycoprotein inhibitors)
   b. Nitrates
   c. Lipid lowering agents
   d. ACE inhibitors/ ARBs
   e. Fibrinolytics
   f. Thrombin inhibitors (Heparin)
   g. Analgesics
   h. Beta Blockers
   i. Aldosterone Blockers

8. Discuss interventional treatments for ACS/ AMI:
   a. PCI -angioplasty
   b. PCI with stent
   c. CABG

9. List the Core Measures for AMI and the rational for these therapies.
GPC-AACN CONSORTIUM
INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

HEMODYNAMIC MONITORING: Basic Concepts & Techniques

Participant Objectives:

1. Identify the mechanical and hemodynamic events occurring during the phases of the cardiac cycle.

2. Define cardiac output, cardiac index, stroke volume, SVR, PVR, and SVI.

3. Define preload, afterload, and contractility in relation to Starlings curve. Discuss assessment, measurement and potential causes of alterations from normal physiological findings.

4. Describe the path of a pulmonary artery (PA) catheter through the heart and identify the waveforms and normal pressures from each vessel or heart chamber.

5. Discuss potential complications from PA catheter.

6. Discuss identification and troubleshooting for the following:
   a. Dampened waveform
   b. Loss of pressure tracing
   c. Blood back-up
   d. Failure to wedge
   e. Catheter migration
   f. Ruptured balloon
   g. Spontaneous wedge
   h. Overwedge

7. Identify components of a fluid filled pressure monitoring system and measures to ensure accuracy and safety.

8. Describe the technique for obtaining accurate pressure measurements.

9. Describe techniques and physiologic considerations for obtaining accurate thermodilution cardiac output measurement. Discuss vented versus non-vented waveforms, where and when to read in the respiratory cycle and ECG.
Participant Objectives:

1. Describe the relationship between contractility, preload, afterload, and heart rate in a patient with heart failure.

2. Describe the following compensatory mechanisms in heart failure:
   a. Increased adrenergic (sympathetic nervous system) activity
   b. Increased renin-angiotensin-aldosterone (RAA) system activity
   c. Increased secretion of vasoconstrictive substances

3. Briefly, describe ventricular remodeling and how it contributes to the progressive nature of heart failure. Briefly identify the types of Cardiomyopathies.

4. Discuss the following classifications of heart failure:
   a. Functional classes (i.e., NYHA)
   b. Systolic versus diastolic heart failure
   c. Left-sided versus right-sided heart failure
   d. Backward versus forward heart failure

5. Review the management of heart failure related to:
   a. Drug therapy
   b. Fluids, diet and sodium restriction
   c. Coronary artery disease management
   d. Dysrhythmia management
   e. Mechanical assistance (LVAD, VAD).


7. Identify core measures in the care of patients with heart failure
   a. Evaluation of LV function
   b. ACEI or ARB for LVSD
   c. Adult smoking cessation advice/counseling
participant Objectives:

1. Apply the "novice to expert" continuum to transition into critical care nursing practice.

2. Using the concepts of change management, explore self-reflection and develop enhanced coping strategies.

3. Understand techniques to maximize orientation and learning experiences.

4. Identify techniques and resources to aid in the alleviation of work-related stress.
Participant Objectives:

1. Describe general pulmonary concepts:
   a. Volumes
   b. Mechanics of normal ventilation
   c. \( O_2 \) transport – oxygen-hemoglobin disassociation curve and noninvasive technology.
   d. Ventilation-perfusion

2. Define acute respiratory failure (ARF) and discuss the pathophysiological mechanisms that lead to ARF:
   a. Hypoventilation
   b. Ventilation-perfusion mismatch
   c. Impaired diffusion
   d. Intrapulmonary shunt

3. Describe the etiology and pathophysiology of the major processes leading to ARF:
   a. Hypercapnia
   b. Hypoxemia

4. Describe the clinical presentation, treatment, and nursing management of ARF.

5. State the normal ranges for arterial blood gas parameters.

6. Review the physiology of acid-base balance.

7. Introduction to the interpretation of abnormal ABG’s.
Participant Objectives:

1. Describe the use of the following therapeutic modalities in patients with compromised ventilation and oxygenation:
   a. Oxygen therapy (limit conversation to advanced methods beyond nasal cannula)
   b. Pulmonary hygiene and positioning
   c. Noninvasive ventilatory technology (CPAP/BiPAP)
   d. Intubation and mechanical ventilation
      i. RT role
      ii. RN role, sedation, medication administration, anticipatory alterations in hemodynamic changes, monitoring of vital signs and oxygen saturation.

2. Discuss the indications and the complications of mechanical ventilation (include aspiration and barotrauma).

3. Describe the difference between pressure and volume modes, including assessment of the patient’s response to these modes.

4. Define and contrast the following modes of ventilation: Assist-Control, IMV, SIMV, pressure support, pressure control, pressure regulated volume control, PEEP, CPAP, PIP and inverse I:E ratio. (Briefly introduce emerging modes of ventilation. Bi-level, APRV, Oscillation High frequency Active valve technology)

5. Discuss the basic ventilator parameters that are necessary for the above modes, specifically, tidal volume ($V_t$), minute ventilation, respiratory rate, and flow.

6. Identify and problem solve ventilator alarms.

7. Discuss bagging procedure in the event of ventilator failure.

8. Discuss emergency procedures/interventions related to: self extubation, code expectations, (remove from vent, bag) RN role, RT role.

9. Discuss how changes in compliance and airway pressure affect the mode selected in patients undergoing mechanical ventilation.

10. Discuss the proper procedure to follow when suctioning a ventilated patient including a patient on PEEP. Highlight the concept that saline instillation down ET tube is not evidence based practice and has potential to increase Ventilator Associated Pneumonia VAP / Ventilator Associated Events (VAE).

11. Discuss mechanical ventilation weaning process, including the importance of RT/RN collaboration and what data is utilized to assess readiness to wean, including spontaneous breathing trial (SBT) and daily awakening trial (DAT).
AIRWAY MANAGEMENT & MECHANICAL VENTILATION (Continued)

12. Discuss how to prepare the equipment and patient for extubation.

13. Identify the signs of immediate and delayed pulmonary compromise in a recently extubated patient and the potential treatments.

14. Describe evidence based strategies for prevention of VAP / VAE.
Participant Objectives:

1. Compare and contrast COPD and asthma in terms of the following:
   a. Etiology
   b. Pathophysiology
   c. Clinical presentation
   d. Treatment modalities
   e. Nursing management

2. Describe risk assessment and prevention strategies for Venous Thromboembolism (VTE). *SCIP Measure*

3. Describe the etiology and pathophysiology of pulmonary emboli including the impact on pulmonary and hemodynamic function.

4. Discuss medical and nursing management of a patient with pulmonary emboli.

5. Discuss the etiology and identification of the patient with adult respiratory distress syndrome (ARDS).

6. Describe the pathophysiology of ARDS.

7. Discuss the medical and nursing interventions associated with ARDS including positioning (e.g., continuous lateral rotation therapy and proning), role of sedation, early nutrition, and work of breathing.

8. Discuss benefits and components of early mobility programs.
PARTICIPANT OBJECTIVES:

1. Describe pathophysiology, hemodynamic changes, and signs and symptoms for each of the following:
   a. Mitral stenosis
   b. Mitral insufficiency
   c. Aortic stenosis
   d. Aortic insufficiency

2. Discuss medical vs. surgical and nursing interventions for the treatment of valvular heart disease.

3. Describe nursing considerations in caring for a patient with valvular heart disease.

4. Briefly describe pulmonic and tricuspid valve abnormalities.
Participant Objectives:

1. Review autonomic nervous system receptors and the effects of stimulation or suppression on heart, lungs, arteries, and other tissues.

2. Review the appropriate compensatory mechanism for hypotension, hypoperfusion and decreased cardiac contractility.

3. Compare and contrast the following categories of drugs: Discuss actions and indication of each drug and why they are chosen in a specific situation/disease process.
   a. Catecholamine (inotropes/chronotropes)
   b. Alpha stimulators/blockers
   c. Beta stimulators/blockers
   d. Ace inhibitors
   e. Calcium channel blockers

4. Discuss the following items for each category of drugs listed above:
   a. Differences in onset and duration
   b. Pharmacodynamics/mechanism of action
   c. Indications and contraindications
   d. Administration, dosage, and titration considerations, active titration to off. Site specific cultural practice maybe present. Concept of these drugs as poison, off as soon as possible
   e. Side effects and toxicity
   f. Rationale for selection (chronotropic, inotropic, alpha, beta, venodilator)

5. Describe clinical scenarios in which multiple vasoactive medications are used at one time to achieve hemodynamic stability.

6. Through the use of clinical scenarios, discuss some strategies for titration.

7. Compare and contrast the different techniques for titration of Norepinephrine versus Vasopressin.
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INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

INTERMEDIATE HEMODYNAMIC CONCEPTS

Participant Objectives:

1. Apply the concepts of cardiac output, stroke volume, preload, afterload and contractility to patient presentation.

2. Through the use of clinical scenarios, identify appropriate hemodynamic goals.

3. Through the use of clinical scenarios, identify interventions to attain hemodynamic goals, including: fluid administration, inotropes, and use of preload and afterload reducers.

4. Discuss the components of oxygen delivery and oxygen consumption.

5. Evaluate oxygen delivery and consumption in terms of the SVO$_2$ and ScVO$_2$.

6. Identify interventions to optimize oxygen delivery and consumption.

7. Discuss alternative tools to evaluating hemodynamics: thermodilution C.O. and noninvasive strategies.
CRITICALLY-ILL SURGICAL PATIENT

Participant Objectives:

1. Discuss major surgical interventions, including abdominal, thoracic, and coronary artery.

2. Briefly describe physiologic responses to major surgeries.

3. Describe the hemodynamic changes in early post-operative patients.

4. Identify complications and their appropriate interventions to prevent/treat including:
   a. Bleeding
   b. Arrhythmias
   c. Fluid and electrolyte imbalances
   d. Atelectasis and other pulmonary problems
   e. Neurologic events
   f. Hemodynamic instability
   g. Glucose management/Hyperglycemia SCIP measures
   h. VTE prevention
   i. Surgical Infection including SCIP measures
   j. Hypothermia
   k. Complications associated with immobility and positioning in OR

5. Discuss the rationale and selection criteria for vasoactive, chronotropic, and/or inotropic infusions in post-operative patients.

6. Provide general overview of the presentation, treatment, and complications of thoracic and abdominal aortic aneurysms (e.g., endovascular stent).

7. Discuss critical care management of patients in the early post-op period.
TARGET AUDIENCE

INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

TEMPORARY CARDIAC PACING

Participant Objectives:

1. Discuss the components of a temporary pacing system.

2. Describe the features and considerations of transvenous, epicardial and transcutaneous temporary electrode systems.

3. Identify the function and physiologic considerations for common modes of temporary pacing.

4. Define pacing threshold and sensitivity.

5. Identify on an ECG tracing, the key components of assessment for pacer functioning.

6. Identify potential pacing problems and the appropriate interventions for:
   a. Under-sensing
   b. Over-sensing
   c. Failure to fire
   d. Failure to capture

7. Discuss safety considerations for the patient with a temporary pacemaker.
Participant Objectives:

1. Describe the key components of a neurologic assessment for the critical care patient.
2. Correlate assessment findings to the structure and function of the brain.
3. Describe the pathophysiology of neuronal cell death and intracranial hypertension.
4. Describe cerebral autoregulation and the relationship between intracranial volume and intracranial pressure (ICP).
5. Define Cerebral Perfusion Pressure (CPP).
6. Describe the pathophysiology and nursing considerations for common types of neuroscience problems.
7. Discuss ICP monitoring, methods, indications, and considerations.
8. Identify evidence-based, published guidelines for medical management and nursing interventions for critically-ill neuroscience populations.
9. Through case presentation, integrate the concepts of neurologic assessment, ICP management, and intervention.
10. Discuss ischemic stroke versus hemorrhagic stroke. Include Modified and NIHSS scales.
11. Briefly discuss designated stroke center certification requirements.
Participant Objectives:

1. Identify factors that contribute to pain and common barriers to effective pain management and assessment.

2. Identify non-pharmacologic and pharmacologic interventions available for managing pain.

3. Discuss the continuum of sedation (anxiolysis, moderate, deep, and general anesthesia), medication selection, appropriate monitoring parameters and nursing considerations.

4. Differentiate procedural sedation and sedation practices for the mechanically ventilated patient.

5. Discuss the movement away from continuous sedation toward intermittent drug administration and the rationale.

6. Review objective measurement tools available for assessing anxiety, pain, and level of sedation. Include pain assessment in sedated patients/non-verbal/mechanically ventilated patients (i.e. pain related behaviors).

7. Discuss the pharmacology, indications, and side effects of neuromuscular blockade (NMB). Include the concept of malpractice for the administration of NMB without sedation.

8. Describe clinical assessment, Train of Four testing (TOF), and nursing considerations for the patient receiving neuromuscular blockade (NMB). Introduction of BIS technology.

9. Introduce OSBN guidelines regarding sedation and anesthetic agents (e.g. ketamine and propofol).

10. Describe rationale and process for daily awakening trials (DAT). Introduce ABCDE Bundle.

11. Differentiate and discuss mechanisms of actions of benzodiazepines, sedatives, and alpha 2 blockers.
Participant Objectives:

1. Identify key components of the operative course that impact the transition of the critically-ill patient from the operating room to the intensive care unit.

2. Discuss nursing priorities in assessment and management of the patient post-general and regional anesthesia.

3. Describe the complications and side effects to anesthetic agents, including malignant hyperthermia and post-operative nausea and vomiting.

4. Describe signs of airway emergencies.

5. Describe the treatment for post-anesthesia complications.

6. Discuss the “comparable care” concept of the unrecovered mechanically ventilated patient in critical care versus PACU. Define RN responsibilities in relation to anesthesia recovery in this situation (e.g., 1 to 1 nursing).
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INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

DONOR MANAGEMENT IN THE ICU

Participant Objectives:

1. Identify patient populations that are referred to the donation agencies:
   a. Pacific Northwest Transplant Bank (PNTB)
   b. Lions Eye Bank (LEO)
   c. Community Tissue Services (CTS)

2. Discuss what is meant by the terms “early referral and clinical triggers”, listing the active roles of each team member.

3. Describe the major steps of donor management.

4. Identify common concerns of families facing these circumstances.

5. Through the use of clinical case studies, describe the donation process.
Participant Objectives:

1. Identify components for the assessment of liver function.

2. Discuss the pathophysiology and clinical management of hepatic diseases found in the critical care setting: liver failure, hepatitis, cirrhosis, and hepatic encephalopathy.

3. Describe the etiology, pathophysiology, and management of acute pancreatitis.

4. Describe nutritional support in pancreatitis, to include post-pyloric feeding.

5. Discuss the hemodynamic, pulmonary, and endocrine complications of acute pancreatitis.

6. Identify the most frequent causes of GI hemorrhage including esophageal varices requiring admission to critical care and discuss the related pathophysiology.

7. Describe the critical care clinical management of GI bleeding and hemorrhagic shock.
Participant Objectives:

1. Identify patients at risk for developing hypovolemic, septic, cardiogenic, anaphylactic, and neurogenic shock.

2. Describe physiologic compensatory mechanisms for shock.

3. Differentiate SIRS, Sepsis, Septic Shock criteria.

4. List the physical signs and symptoms of patients in shock.

5. Identify hemodynamic monitoring parameters found in different shock states.

6. Anticipate the critical care needs for patients in different shock states.

7. Discuss potential complications of the shock state, including MODS.

8. Differentiate between intravascular and extravascular fluid spaces and how fluid moves between them.

9. Describe the differences between crystalloid and colloid solutions.

10. Select the most appropriate IV fluid to use based on the clinical situation.

11. Discuss the risks and benefits of the following fluid replacement products:
   a. Crystalloid
      I. LR
      II. NS
      III. Plasmalyte
   b. Colloid
      I. Albumin
      II. Hetastarch
      III. PRBC’s
      IV. PPF
      V. FFP
   c. Dextran
   d. Blood components (platelets, cryoprecipitate)

12. Discuss most updated guidelines for Sepsis (e.g. criteria, lactate, SCVO₂, fluids, antibiotics within an hour).
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INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

RENAL ISSUES

Participant Objectives:

1. Describe the structure and function of the kidney.

2. Discuss degrees of renal injury in terms of risk, injury, failure, loss and end-stage disease (i.e. RIFLE criteria).

3. Identify factors and treatment modalities which place the critically ill patient at risk for developing renal failure (e.g. nephrotoxic drugs, contrast dye, diuresis, dehydration, iatrogenic).

4. Discuss renal protective strategies (e.g. Mucomyst, etc.).

5. Identify the pathophysiology and laboratory abnormalities of pre-renal failure, intra-renal failure and post renal failure.

6. Describe the identification, pathophysiology, and treatment of rhabdomyolysis.

7. Compare and contrast the indications for intermittent hemodialysis and continuous renal replacement therapy in the critically-ill patient.
Participants Objectives:

1. Identify the effects of critical illness on metabolism including catabolism and stress starvation.

2. Describe the nutritional assessment and support of critically-ill patients with the following:
   a. Pre-Existing Malnutrition
   b. Advancing Age (Age >70)
   c. Cardiac Disease
   d. Pulmonary Disease
   e. Acute Renal Failure
   f. Acute Pancreatitis
   g. Liver Failure
   h. Brain Injury
   i. Multiple Trauma/Burn
   j. Sepsis
   k. Re-feeding syndrome
   l. Translocation of bacteria
   m. Pressure Ulcer risk
   n. Glutamine
   o. Vitamin D
   p. Trimethylamine N-oxide (TMAO)

3. Compare and contrast the clinical indications, contraindications, precautions, and considerations of enteral and parenteral nutrition.
Participant Objectives:

1. Discuss the goals of evidence-based glycemic control.

2. Discuss moving target of ideal blood glucose care and range for the critically-ill surgical and medical patient.

3. Differentiate between the signs, symptoms, and clinical management of diabetic ketoacidosis (DKA) and Hyperosmolar Hyperglycemic State (HHS).

4. List the signs, symptoms, and nursing interventions related to hypoglycemia.

5. Review the pathophysiology and clinical management of diabetes insipidus (DI).

6. Review the pathophysiology and clinical management of the syndrome of inappropriate antidiuretic hormone (SIADH).
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INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

COAGULOPATHIES / DIC

Participant Objectives:

1. Describe the normal mechanisms of hemostasis, coagulation, and fibrinolysis.

2. List predisposing factors to the development of coagulopathy / DIC in the critical care population.

3. Discuss the clinical picture of a patient with coagulopathy / DIC.

4. Interpret the laboratory studies pertinent to the patient with coagulopathy / DIC, including the limitations of the D-dimer.

5. Describe medical and nursing considerations for managing coagulopathy / DIC.

6. Describe the indications for use of following blood component replacement products:
   a. PRBC's
   b. Platelets
   c. Fresh Frozen Plasma
   d. Cryoprecipitate
   e. Whole blood
DRUG OVERDOSE

Participant Objectives:

1. Describe the pertinent history and patient assessment of a suspected intoxication or drug overdose.

2. Discuss the concepts of drug absorption and drug elimination and their role in managing a suspected intoxication or drug overdose.

3. Review the resuscitation, stabilization and monitoring of a patient who is suspected of ingesting or being exposed to:
   a. Acetaminophen
   b. Alcohols
   c. Benzodiazepines
   d. Carbon Monoxide
   e. Cocaine
   f. Opioids
   g. Salicylate
   h. Tricyclic Antidepressants
   i. Methamphetamine
   j. Heroin
   k. Bath Salts
   l. Fake Pot
   m. Antifreeze

For objectives 4-7 please refer to the information adjacent to these objectives, the Pulmonary Concepts & Airway Management/Mechanical Ventilation Presentations, in addition to your specific institutional policies and procedures:

4. Follow unit protocols regarding:
   a. Maintaining patent airway/prevent aspiration of GI contents.
   b. Monitoring adequacy of ventilation.
   c. Management of secretions.

5. Discuss critical elements of suicide risk & safety measures (e.g. searching / removing belongings). If overdose was a suicide attempt, follow unit protocols/MD orders to prevent self-harm while hospitalized. These may include:
   a. Constant (one-on-one) observation.
   b. Search patient and belongings upon arrival to room. Remove items from the environment that may precipitate destructive behavior / self-harm (medications, lighters, weapons, sharp items, cords, glass, IV poles).

   c. Mental Health consult to assess for ongoing suicidal ideations. A suicidal patient may only be deemed safe by the mental health professional or designee responsible for this assessment.
   d. Ensuring confidentiality as a particular concern.

   DRUG OVERDOSE (Continued)

   c. Mental Health consult to assess for ongoing suicidal ideations. A suicidal patient may only be deemed safe by the mental health professional or designee responsible for this assessment.
   d. Ensuring confidentiality as a particular concern.
6. Review Visitor Screening & List nursing interventions for the intoxicated or violent patient / family member.

7. Discuss need to screen or limit visitors in cases of suicidal or other drug overdose patient. (Follow hospital/department guidelines if visitors are disruptive, impaired or otherwise present risk to well-being of patient or staff.)
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INTRODUCTION TO CRITICAL CARE NURSING PROGRAM

NEUROCOGNITIVE EFFECTS OF CRITICAL CARE & CRISIS MANAGEMENT

Participant Objectives:

1. Discuss psychosocial needs and experiences of the critically-ill patient/family in crisis.

2. Identify nursing interventions to aid the family of a critically-ill patient in coping with critical illness and the critical care setting. (e.g. Family conference, family care, family presence during code.) Consider patient’s right to define their own family.

3. Identify nursing interventions for the patient who exhibits the following:
   a. Anger / hostility
   b. Anxiety
   c. Denial
   d. Depression
   e. Fear
   f. Hopelessness

4. Discuss potential problems associated with critical illness/ ICU environment and interventions (e.g. sleep deprivation, sedation practices, sensory deprivation/overload, and powerlessness).

5. Define delirium and list influencing factors, including the use of delirium assessment tools (e.g. CAM-ICU and ICDSC).

6. Identify nursing and collaborative interventions to treat delirium (e.g. ABCDE Bundle)

7. Describe the role of analgesia and sedation management in both preventing and contributing to delirium, disturbing memories, and PTSD.

8. Discuss long term neurocognitive effects of critical illness, delirium on depression, quality of life, function, and ability to return to work.
Participant Objectives:

1. Discuss the ethical concepts of:
   a. Autonomy
   b. Justice
   c. Beneficence
   d. Nonmaleficence

2. Identify the process for decision making when the patient is unable to decide for themselves or communicate their wishes.

3. Explore the role of the patient, surrogate, physician, and nurse in the following situations:
   a. Determining resuscitation status POLST
   b. Provision of life sustaining treatment
   c. Withdrawal of life sustaining treatment

4. Discuss the principle of double effect.

5. Utilizing clinical scenarios, evaluate the principles of a given ethical dilemma.

6. Define and discuss moral distress and self-care.