Advanced Practice Registered Nurse (APRN) Master's Emergency Care Nurse Practitioner specialization – State Exam Topics - Theory

1. Non-injurious etiology of limb pain
    a. **Anatomy, physiology, pathophysiology:** anatomical structures of the limbs, regional anatomy anatomical and regional limb anatomy, movements. Sensory and motor innervation of the limb, characteristic paralyses. Hemostasis, thrombophilia.
    b. **Differential diagnosis:** pathological processes with high time factor causing limb pain, diagnostic methods and tools. Embolization and thrombosis. Inflammatory processes.
    c. **Therapy, monitoring, organizational tasks:** Emergency care of pathologies causing lower limb pain, monitoring tasks, care pathway.
    POCT diagnostics in emergency care.
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2. Chest pain
    a. **Anatomy, physiology, pathophysiology:** anatomical structures of the chest. The thoracic viscera topography of the thoracic thymus. Assessment of pain in emergency care. Definition of ACS, Etiological types of AMI. Complications of ACS.
    b. **Differential diagnosis:** high time factor pathologies associated with chest pain, diagnostic methods and tools. Clinical presentation of ACS, MPE.
    c. **Therapy, monitoring, organizational tasks:** the emergency care of chest pain pathologies, care pathway, monitoring patients. Definitive therapeutic options.
    Role of laboratory tests in emergency diagnosis.

3. Headache
    a. **Anatomy, physiology, pathophysiology:** Anatomy, structures, sensory and motor innervation of the head and neck region. The blood supply to the brain, meninges, the areas between the meninges. Neuroanatomy of pain.
    b. **Differential diagnosis:** Evaluation of headaches in emergency care. Traumatic and non-traumatic headache events with high time factor that cause headaches, associated major symptoms, differential diagnostics options.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options for the disease processes that cause or are associated with headaches, the importance of monitoring, care pathway.
    The role of radiographic evidence in emergency diagnostics.

4. Abdominal pain
    a. **Anatomy, physiology, pathophysiology:** Anatomical structure of the abdomen. Abdominal regions, topographic conditions of abdominal and retroperitoneal viscera. The role, course and formation of the peritoneum. Blood supply to the abdominal viscera.
    b. **Differential diagnosis:** Evaluation of diseases with high time factor causing abdominal pain, the most important associated symptoms, and the possibilities of differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic possibilities in the

case of certain diseases that cause or are associated with abdominal pain, the importance of monitoring, care pathway.

Emergency assessment. Prioritization.

5. Stroke
    a. **Anatomy, physiology, pathophysiology:** Structure and blood supply of the brain. Flames, gyrus, sulcus. Motoric and sensory as well as prefrontal cortex, major functional fields. Mono- and polysynaptic reflexes, their physiological significance. The cerebral blood supply.
    b. **Differential diagnosis:** Evaluation of signals in emergency care. The pathology of stroke, symptoms, differential diagnostic options. Ischemic and hemorrhagic stroke processes, localization. Stroke mimics.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    The pathway of emergency care, the responsibility of each actor in the care pathway.
6. Vertigo
    a. **Anatomy, physiology, pathophysiology:** Anatomy of the auditory and balance system, vestibular and acoustic pathways and nuclei. The physiological process of hearing and balancing.
    b. **Differential diagnosis:** Examination of a patient with vertigo, statokinetic tests for central and peripheral etiology. Vertigo syndrome, a harmonic and disharmonious syndrome. The role of imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks: T**herapeutic options, significance of monitoring, care pathway.
    Communication in emergency care, crisis management.

7. Heart failure
    a. **Anatomy, physiology, pathophysiology:** The structure of the heart. Physiological characterization of the cardiac cycle. Frank-Starling pressure-volume loop curve. Factors determining cardiac pump function. Pathophysiological classification of heart failure.
    b. **Differential diagnosis:** Symptoms of heart failure (forward and backward defects, small and large circulatory manifestations), pathological diagnosis. The role of laboratory tests and imaging in the diagnosis.
    c. **Therapy, monitoring, organizational tasks: T**herapeutic options, significance of monitoring, care pathway.
    Special nursing duties in emergency care.

8. Circulatory shock
    a. **Anatomy, physiology, pathophysiology:** Anatomical structure of the circulatory system, functional characterization of the individual vascular sections. Regulation of tissue microcirculation. Pathophysiological division and classification of shock, assessment of severity.
    b. **Differential diagnosis:** Ethological examination of a shock patient. The role of imaging and laboratory tests in diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Possibilities of monitoring in emergency care.

9. Periarrhythmias
    a. **Anatomy, physiology, pathophysiology:** The stimulus-forming and stimulus-conducting system of the heart. Action potential in the myocardium. Mechanisms of stimulus formation disorders: acceleratio, pituitary rhythm. Re-entry.
    b. **Differential diagnosis:** Identification and recognition of peri-arrest arrhythmias. Options for ECG diagnostics.
    c. **Therapy, monitoring, organizational tasks:** Tachycardia and bradycardia algorithm, antiarrhythmic therapy (pharmacological and electrotherapeutic options), importance of monitoring, care pathway.
    Specialties and organization of pre-hospital emergency care.

10. Syncope and collapse
    a. **Anatomy, physiology, pathophysiology:** Regulation of circulation: regulation of blood pressure, factors influencing venous return. Regulation of cerebral blood flow.
    b. **Differential diagnosis:** A distinctive diagnosis of short-term or momentary loss of consciousness. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Characteristics of emergency disease processes: progressivity, processivity, acute.

11. Unconscious patient
    a. **Anatomy, physiology, pathophysiology:** Anatomy of the brainstem. RAS, regulation of arousal. The concept of consciousness. Classification of disorders of consciousness, major diseases.
    b. **Differential diagnosis:** A distinctive diagnosis of vigilance disorders. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    The emergency patient care team.

12. Confused patient
    a. **Anatomy, physiology, pathophysiology:** Integrative functions and physiological basis of the cortex. Regulation of physiological blood glucose levels. Definition of consciousness, classification of disorders.
    b. **Differential diagnosis:** The strategy of investigating the disease underlying the disorder, the distinctive diagnosis. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks: t**herapeutic options, significance of monitoring, care pathway.
    Decision-making in emergency care: emergency decision-making situations, limitations. Evaluation of predictive characteristics in clinical diagnostics.

13. Diseases associated with convulsions, paresis
    a. **Anatomy, physiology, pathophysiology:** Motor cortex functions. Structure and function of striated muscle tissue. Inhibitory and excitatory neurotransmission in the central and peripheral nervous system. The neuromuscular junction.
    b. **Differential diagnosis:** Diseases associated with convulsions (with epileptic seizures) and their differential diagnosis. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    The logical process of emergency diagnostics, the importance of ABCDE.

14. Fever, hypothermia
    a. **Anatomy, physiology, pathophysiology:** Anatomy and functional characterization of the thalamus. The concept and maintenance of homeostasis. Regulatory mechanisms of isothermia. Causes and mechanisms of fever. Endogenous and exogenous pyrogens. The response to infection, the pathophysiological process of inflammation.
    b. **Differential diagnosis:** Differential diagnosis of febrile disease processes, recognition and complications of hypothermia. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Nursing the ventilated patient.

15. Sepsis
    a. **Anatomy, physiology, pathophysiology:** Pathogenicity of human pathogens. The structure of the immune system, its main functional processes. The disease process, complications and consequences of sepsis. Disseminated intravascular coagulation (DIC).
    b. **Differential diagnosis:** Recognition of sepsis, risk stratification, applicable score systems, assessment of severity. The role of ECG, laboratory test and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, time windows. Significance of monitoring, care pathway.
    Volume therapy in emergency care.

16. Respiratory failure
    a. **Anatomy, physiology, pathophysiology:** The structure of the respiratory system, conductive and respiratory stages. Physiological process of respiration, biophysical characterization of ventilation. Pathophysiological division of respiratory failure: partial and global respiratory failure. The effect of IPPV on the body.
    b. **Differential diagnosis:** Diagnosis of respiratory failure. The role of ECG, laboratory tests and imaging in differential diagnosis. Blood gas analysis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.

Respiratory therapy, the most important parameters, methods and monitoring tasks of ventilation.

17. Obstructive and restrictive respiratory disease processes
    a. **Anatomy, physiology, pathophysiology:** The structure of the bronchus tree, the alveoli. Diffusion and perfusion in the alveoli, the process of tissue perfusion and diffusion. Pathophysiological division of respiratory diseases. Pathophysiology of bronchial asthma.
    b. **Differential diagnosis:** Diagnosis and diagnosis of respiratory diseases that have not yet resulted in respiratory failure. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    The role and means of oxygenization in emergency care.

18. Suffocation
    a. **Anatomy, physiology, pathophysiology:** Morphological and physiological characteristics of respiratory regulation. Effects and pathophysiological limitations of oxygen. Oxygen toxicity.
    b. **Differential diagnosis:** Diagnostic processes associated with suffocation and their differential diagnosis. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Significance and methodology of the triage.

19. Renal failure
    a. **Anatomy, physiology, pathophysiology:** Structure and function of the urinary system. Pathophysiology and manifestations of acute and chronic renal failure.
    b. **Differential diagnosis:** Recognition of acute renal failure, differential diagnostic tasks. The role of ECG, laboratory tests and imaging studies in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway. Dialysis and pheresis therapies.
    Toxicological care, decontamination.

20. Metabolic diseases and complications
    a. **Anatomy, physiology, pathophysiology:** Anatomical structure of endocrine glands. Physiological process of endocrine regulation, feed-back processes. The structure of the bronchus tree, the alveoli. Pathophysiology and complications of diabetes mellitus.
    b. **Differential diagnosis:** Diagnosis of the pathology of chemical regulation, certain metabolic diseases and their complications. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Oncological emergencies.

21. Seriously injured patient
    a. **Anatomy, physiology, pathophysiology:** Structure of bones, characteristics of muscles. Blood supply to the connective and supporting tissue. Changes in bone composition with age. Controlled and uncontrollable blood loss.
    b. **Differential diagnosis:** Examination of the severely injured patient, diagnosis of injuries. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Symptomatic therapeutic options, the importance of monitoring, care pathway.
    Immobilization and mobilization in emergency care, possibilities and organization of patient transport. Transport of a critically ill patient.

22. Icterus
    a. **Anatomy, physiology, pathophysiology:** The process of bile secretion. Anatomy of the intra and extrahepatic bile ducts. Bilirubin metabolism. Dividing and pathological isolation of icterus. Exocrine pancreas.
    b. **Differential diagnosis:** Diagnosis of icterus related pathological diseases. The role of laboratory tests and imaging studies in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    Patient education in emergency care.

23. Hepatic failure. Gastrointestinal bleeding.
    a. **Anatomy, physiology, pathophysiology:** Macroscopic and microscopic structure of the liver. The organization of lobules. Circulation of the abdominal viscera, portal circulation. Consequences of portal hypertension, portocaval anastomoses, bleeding complications. Parenchymal and vascular decompensation of liver failure.
    b. **Differential diagnosis:** Diagnosis of hepatic failure, pathological diagnosis of the disease processes. The role of laboratory tests and imaging studies in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.
    The place and role of APRN in emergency care.

24. Drug intoxication.
    a. **Anatomy, physiology, pathophysiology:** Molecular basis of drug action: receptor-ligand interaction, secondary messengers. Competitive and non-competitive antagonism, agonist effect. The fate of drugs in the body, pharmacokinetics. Mechanisms of action of major drug groups.
    b. **Differential diagnosis:** Recognition of drug intoxication, characteristic syndromes. The role of ECG, laboratory tests and imaging in differential diagnosis.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic options, significance of monitoring, care pathway.

Supply in emergency care, hazardous substances and agents.

25. Clinical death
    a. **Anatomy, physiology, pathophysiology:** Electrophysiological background of circulatory arrest. Pre-arrest disease processes. Electrotherapy in emergency care. The myocardium, as an irritatable tissue, electromechanical junction.
    b. **Differential diagnosis:** Recognition of reversible conditions of peri-arrest. Recognition of circulatory arrest, examination of circulatory signs. ROSC. Identification of the initial rhythm.
    c. **Therapy, monitoring, organizational tasks:** Therapeutic algorithms, tasks and time windows during resuscitation. Significance of monitoring (impact, result, success), care pathway.

    Organization of domestic emergency care.

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State Exam Topics – Skill room practice

The student shall complete each of the following tasks:

1. Reanimatology (ALS)
2. Airway management
3. ECG trace analysis
4. Laboratory findings / astrup

5. Practical examination on a simulation phantom, emergency diagnosis and care of a patient with one of the following conditions:

1. Cardiac arrest
2. SVPT
3. III° AV Block
4. ACS
5. Unstable tachycardia
6. Stable tachycardia
7. Hypertensive emergencies
8. Acute left-sided heart failure
9. Pulmonary embolism
10. Dissection / rupture of aorta
11. Care for a severely injured person
12. Respiratory failure: partial and global
13. Severe asthma attack
14. Airway foreign body
15. Ictus electricus
16. Submersion
17. HELLP syndrome
18. Childbirth management
19. Anaphylaxis
20. Status epilepticus
21. Morgagni-Adams-Stokes
22. Mesenteric thrombosis
23. Ileus
24. Unconscious patient
25. Sepsis / septic shock

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State Exam Topics – Hospital practice

The student shall complete each of the following tasks:

1. Exam element in the emergency department:
    - department visit,
    - answering questions related to hospital patients, evaluating findings,
    - setting up a medical ventilator
2. Examination at the outpatient clinic:
    - Supervised care of at least 5 patients with peri-arrest (triage category I-II)
    - Supervised care of 5 more patients in triage category III-V