Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY
Head of the Department of
Anesthesiology, Resuscitation, Intensive
Care, and Emergency Medical Care
_____ / Shumatov V.B./
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COLLECTION OF ASSESSMENT TOOLS
Б1.О.36 Anesthesiology, resuscitation, and intensive care
of the basic educational program
of Higher Education

Specialty	**31.05.01 General Medicine for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system)
Mode of study	**Full-time**
Period of mastering the BEP	**6 years** (nominal length of study)
Department	of Anesthesiology, Resuscitation, Intensive Care, and Emergency Medical Care

Vladivostok, 2025

1. INTRODUCTION

1.1. Collection of Assessment Tools is a document that regulates the format, content, and types of assessment tools for continuous assessment, interim examination and final (state final) examination, and graded criteria for each type of assessment tools.

1.2. Assessment tools allows to evaluate the development of universal, general professional, and professional competencies (UCs, GPCs and PCs respectively) outlined in Federal State Educational Standard of Higher Education and defined in the basic educational program of higher education for the specialty 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system).

(BEP HE for the 31.05.01 General Medicine for international students (in English) specialty, section 3 Learning Outcomes Requirements of the Basic Educational Program of Higher Education)

2. DOCUMENT BODY

2.1. Types of Assessment, Formats of Assessment Tools

No.	Types of assessment	Assessment Tools Format
1	**Continuous assessment**	**Tests**
2	**Interim assessment**	**Mini-Case Studies**
		Checklists

3. The contents of assessment tools for continuous and interim examination are prepared by the teacher of the course

1. Tests for continuous assessment on the “Intensive care in patients with acute respiratory failure or ARDS” topic

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What manifests as dyspnea at rest and cyanosis? 1) stage I respiratory failure 2) stage II respiratory failure +3) stage III respiratory failure 2. What is characteristic of stage III hypercapnic respiratory failure? +1) loss of consciousness, dilated pupils, areflexia, diffuse

		cyanosis, low blood pressure, bradyarrhythmia, $PaCO_2$ > 70 mm Hg 2) loss of consciousness, dilated pupils, convulsions, diffuse cyanosis, low blood pressure, bradyarrhythmia, PaO_2 > 70 mm Hg 3) obtundation, constricted pupils, hyperemia of the skin, low blood pressure, tachyarrhythmia, $PaCO_2$ - 50 mm Hg 4) shortness of breath; patients are euphoric, talkative; the skin is hot to the touch, hyperemic; blood pressure is increased, tachycardia up to 100-120/min 3. What is characteristic of hypercapnic respiratory failure? 1) $PaO_2\uparrow$, $PaCO_2\uparrow$, $V_A\downarrow$, $V_A/Q=N$ 2) PaO_2 =_N, $PaCO_2\uparrow$, $V_A\downarrow$, $V_A/Q < 0,8$ +3) $PaO_2\downarrow$, $PaCO_2\uparrow$, $V_A\geq N$, $V_A/Q=N$ 4) $PaO_2\downarrow$, $PaCO_2\downarrow$, $V_A\uparrow$, $V_A/Q=N$ 4. What is capnography? 1) non-invasive monitoring of PCO2 at the end of a resting inhale +2) non-invasive monitoring of PCO2 at the end of a resting exhale 3) invasive monitoring of PCO2 at the end of a resting inhale 4) invasive monitoring of PCO2 at the end of a resting exhale 5. What oxygen concentration is provided by a nasal cannula? 1) 15-20% +2) 24-44% 3) 45 - 50% 4) 50-60% 6. What can cause thoracodiaphragmatic respiratory failure? 1) pneumonia 2) foreign body of the airways +3) intestinal paresis and gastrostasis with the development of compartment syndrome 4) traumatic brain injury 7. Which value is required to assess the effectiveness of ventilation? 1) volume of physiological respiratory dead space (VD) 2) tidal volume (VT) +3) VD/ VT ratio 4) VT/ VD ratio 8. Which of the following causes the most pronounced mixed type of impairment of the gas exchange function of the lungs? 1) bronchial asthma 2) focal pneumonia +3) respiratory distress syndrome 4) dry pleurisy

		5) inflammation of the respiratory muscles (myositis) 9. What is NOT included in the strategy of "protective" ventilation in patients with ARDS? +1) P_{peak} greater than 35 cm H2O 2) $P_{plateau}$ less than 25 cm H2O 3) Peak Inspiratory Flow Rate 30 - 80 L/min 4) inhalation/exhalation (I/E) ratio less than 1:1.2 10. What is the recommended tidal volume for patients with ARDS (calculated per ideal body weight)? 1) 12-20 mL/kg 2) 10-12 mL/kg 3) 9-10 mL/kg +4) 6-8 mL/kg

2. Tests for continuous assessment on the “Intensive care in patients with acute cerebrovascular insufficiency” topic

	Code	**Competence description / name of labor function / name of work activity / text**
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F	A/01.7	Providing emergency and urgent medical care to the population
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What does NOT characterize comatose state? 1) decreased tendon reflexes 2) bilateral Babinski's sign 3) inhibition of abdominal reflexes 4) inhibition of pupillary reactions +5) targeted defensive reactions 2. What does NOT characterize stupor? +1) adequate response to all stimuli 2) incoherent verbal contact 3) inability to execute simple and complex commands 4) coordinated and localized response to pain 3. What is characteristic of coma? 1) adequate response to all stimuli 2) verbal contact requiring simple answers such as "yes" and "no" 3) ability to perform only simple commands +4) non-localized pain response

		4. What is the normal intracranial pressure? 1) 0-5 mm Hg +2) 0-15 mm Hg 3) 15-20 mm Hg 4) 20-30 mm Hg 5. What is NOT included in the acute cerebrovascular insufficiency? +1) epilepsy 2) hemorrhagic stroke 3) transient ischemic attack 4) ischemic stroke 6. What is a common cause of non-traumatic subarachnoid hemorrhage? +1) cerebral aneurysms 2) rheumatic heart disease 3) cerebrospinal hypertension 4) brain tumor 7. What is NOT a cause of a stroke? 1) abnormality of development of cerebral vessels 2) persistent hypertension 3) blood diseases +4) varicose veins of the lower extremities 8. What is a history of transient monocular blindness characteristic of? 1) subarachnoid hemorrhage +2) ischemic stroke 3) hemorrhagic stroke 4) chronic subdural hematoma 9. What is the strongest headache a person has ever felt as the initial symptom characteristic of? +1) subarachnoid hemorrhage 2) ischemic stroke 3) hemorrhagic stroke 4) traumatic brain injury 10. What kind of coma is characterized by the presence of acetone smell? 1) hypoglycemic +2) hyperglycemic ketoacidotic 3) hyperglycemic hyperosmolar 4) uremic

3. Tests for continuous assessment on the “Intensive care in patients with acute cardiovascular insufficiency. Emergency cardiology” topic

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S	31.05.01	General Medicine for international students (in English)
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		workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
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F	A/01.7	Providing emergency and urgent medical care to the population
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. Which arrhythmia is considered safe according to the clinical classification of ventricular arrhythmias (according to the risk stratification of T. Bigger)? 1) frequent ventricular extrasystole (10 or more per hour) in patients with postinfarction cardiosclerosis 2) sustained ventricular tachycardia in patients with severe myocardial involvement and low ejection fraction +3) frequent ventricular extrasystole (10 or more per hour) in patients without organic heart damage 4) group sequential extrasystoles 2. What is the time frame between the first symptoms of the patient's deterioration and their death for it to be considered sudden? 1) 30 minutes +2) less than 1 hour 3) 2 hours 4) 6 hours 3. Which condition can be resolved by techniques of mechanical action aimed to excite the vagus nerve? 1) extrasystole 2) sinus arrhythmia 3) atrial fibrillation with WPW +4) supraventricular paroxysmal tachycardia 4. What is NOT considered a sign of atrial fibrillation on the ECG? 1) absence of P waves 2) chaotic f waves of atrial excitation 350-600 per min 3) irregular R-R intervals +4) QRS complexes $\geq$ 0.10 s 5) HR - 140-220 min 5. What is the most effective treatment for cardiac arrhythmias in the event of life-threatening ventricular tachyarrhythmias? 1) radiofrequency ablation +2) electrocardioversion 3) prescription of antiarrhythmic drugs 4) electrical cardiac pacing 6. How much energy is used for cardioversion aimed to relieve rhythm disturbance during atrial fibrillation?

		1) 50-100J 2) 100J +3) 120-200J 4) 200J 7. Which of the following cardiac arrhythmias increase the risk of thromboembolic complications? +1) atrial fibrillation 2) ventricular extrasystole 3) ventricular fibrillation 4) reciprocal supraventricular tachycardias 8. Which rhythm disturbance requires the use of sulphuric acid magnesia as the drug of choice? 1) monomorphic ventricular tachycardia +2) polymorphic ventricular tachycardia "torsade de pointes" 3) supraventricular nodular reciprocal tachycardia 4) atrial flutter 9. Which condition requires slow intravenous administration of 5 - 10 mg of verapamil? +1) tachyarrhythmias with narrow QRS complex, irregular rhythm, and stable hemodynamics 2) tachyarrhythmias with a wide QRS complex, irregular rhythm, and stable hemodynamics 3) tachyarrhythmias with a wide QRS complex, regular rhythm, and stable hemodynamics 10. Which condition requires 1-2 minutes of intravenous administration of 10-20-30 mg adenosine? +1) tachyarrhythmias with narrow QRS complex, irregular rhythm, and stable hemodynamics +2) tachyarrhythmias with narrow QRS complex, irregular rhythm, and stable hemodynamics 3) tachyarrhythmias with a wide QRS complex, irregular rhythm, and stable hemodynamics 4) tachyarrhythmias with a wide QRS complex, regular rhythm, and stable hemodynamics

4. Tests for continuous assessment on the “Impaired fluid and electrolyte balance and acid-base balance” topic

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S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention

F	A/01.7	Providing emergency and urgent medical care to the population
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What is NOT considered one of the main osmotically active substances that maintain normal plasma osmolarity? 1) sodium ions +2) potassium ions 3) glucose 4) urea 2. What is the substance that is directly responsible for the oncotic pressure? 1) sodium ions +2) proteins 3) potassium ions 4) urea 3. What is the proportion of colloidal-oncotic pressure compared to total osmotic blood pressure? +1) 1 % 2) 10% 3) 25 % 4) 30% 4. What is normal oncotic blood pressure? 1) 10 mm Hg 2) 15 mm Hg; 3) 20 mm Hg; +4) 25 mm Hg 5. What is mainly responsible for the osmolarity of the intracellular water space? 1) sodium ions +2) potassium ions 3) glucose 4) proteins 6. What is the normal PCO_2 in the arterial blood? 1) 30 mm Hg +2) 40-46 mmHg 3) 52 mm Hg 4) 60 mm Hg 7. What accompanies respiratory alkalosis? 1) peripheral vasospasm 2) decrease in blood pressure 3) cramps or muscle tremors +4) accumulation of lactates 8. What does respiratory acidosis initially cause? 1) increased pressure in the pulmonary artery trunk +2) hyperventilation 3) reduced cardiac output 4) systemic vasoconstrictive action

		9. The result of acid-base balance assessment shows that all main indicators (pH, BE, $PaCO_2$, PaO_2) are below the norm. What can this imbalance be characterized as? 1) compensated metabolic alkalosis 2) compensated metabolic acidosis 3) subcompensated metabolic acidosis +4) decompensated metabolic acidosis 10. A patient with from bronchial asthma has developed a hypercapnic form of asthmatic condition. The following acid-base balance indicators were identified: pH - 7.21; $PaC0_2$ - 58 mm Hg, PaO_2 - 63 mm Hg; BE - -5 mmol/L. What can this imbalance be classified as? 1) metabolic alkalosis 2) decompensated metabolic acidosis +3) decompensated respiratory acidosis 4) metabolic alkalosis

5. Tests for continuous assessment on the "Fundamentals of infusion therapy, therapeutic enteral and parenteral nutrition" topic

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S	31.05.01	General Medicine for international students (in English)
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I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What is the range of normal plasma osmolarity values? 1) 240-260 mOsm/L 2) 265-280 mOsm/L +3) 285-310 mOsm/L 4) 310-330 mOsm/L 2. Content of which substance differs the most between the liquid phase of the blood and the interstitial fluid? +1) proteins 2) potassium ions 3) calcium ions 4) sodium ions 3. Which type of water imbalance includes hyperglycemic diabetes mellitus? 1) hypoosmolar dehydration +2) hyperosmolar dehydration

		3) hypoosmolar hyperhydration 4) hyperosmolar hyperhydration 4. Which type of water imbalance includes Acute Kidney Injury? 1) hypoosmolar dehydration +2) hyperosmolar dehydration 3) hypoosmolar hyperhydration +4) hyperosmolar hyperhydration 5. Which of the following conditions does NOT cause hyperkalemia? 1) transfusion of large doses of preserved blood 2) metabolic acidosis +3) metabolic alkalosis 4) Acute Kidney Injury 6. Which nutrient has the highest energy value? 1) proteins – 9 kcal/g 2) carbohydrates – 7 kcal/g +3) lipids – 9 kcal/g 7. What is the recommended nitrogen to non-protein calories ratio? +1) 1:110 – 130 2) 1:200 3) 1:300 8. How much nitrogen is expended normally? 1) none 2) 0.8 – 1 g/kg/day +3) 0.12 – 0.16 g/kg/day 9. What nutritional deficiency does stress starvation usually leads to? 1) marasmus +2) kwashiorkor 3) deficiency of essential fatty acids 10. What is the Body Mass Index? 1) patient height in cm - 100 2) patient weight in kg/height in cm +3) patient weight in kg/height in cm^2

6. Tests for continuous assessment on the “Intensive care in patients with acute liver and kidney failure” topic

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts

C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
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F	A/01.7	Providing emergency and urgent medical care to the population
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What is the criterion for an unfavorable prognosis in fulminant liver failure? +1) INR> 7.7 2) 200 mmol/L serum bilirubin 3) pH=7.3 4) serum creatinine ≤ 300 μmol/L 2. Which syndrome is NOT a part of liver failure? 1) hyperdynamic 2) edematous-ascitic 3) hepatopulmonary +4) kidney failure 3. What is the basis of hepatorenal syndrome? 1) hypovolemia 2) tubular necrosis +3) renal vasospasm 4) renal vasculitis 4. What is the basis of hyperdynamic and hepatopulmonary syndromes? 1) increased cardiac output 2) reduced cardiac output 3) vasoconstriction +4) peripheral vascular dilatation 5. Which sign is NOT included in the hepatopulmonary syndrome? 1) warm cyanosis 2) hypoxemia +3) orthopnea 4) increase in alveolar-arterial oxygen difference 6. What is the mechanism of Acute Kidney Injury in patients with liver failure? 1) intrarenal vasoconstriction with normal systemic vascular tone 2) intrarenal vasodilation with normal systemic vascular tone +3) intrarenal vasoconstriction with systemic vasodilation 4) intrarenal vasodilation with systemic vasoconstriction 7. What does acute urate nephropathy lead to? 1) prerenal Acute Kidney Injury 2) intrinsic (renal) Acute Kidney Injury +3) postrenal Acute Kidney Injury

		8. What causes non-oliguric Acute Kidney Injury? 1) hypovolemia +2) aminoglycosides 3) renal ischemia 4) heavy metal salts 9. What is the most common cause of intrinsic (renal) Acute Kidney Injury? +1) acute tubular necrosis 2) interstitial nephritis 3) renal artery thrombosis 4) glomerulonephritis 10. What must be urgently performed in case of hyperkalemia over 6.0 mmol/L and the detection of changes on the ECG? +1) administer 10 ml of calcium gluconate intravenously 2) intravenously administer a glucose-insulin-bicarbonate mixture 3) administer potassium exchange resins 4) start hemodialysis

7. Tests for continuous assessment on the "Clinical and diagnostic concept and treatment of sepsis and multiple organ failure" topic

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
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I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What is the maximum volume of crystalloid solutions that must be infused during the first 3 hours of treatment of hypoperfusion caused by sepsis? 1) 10 mL/kg 2) 20 mL/kg +3) 30 mL/kg 4) 40 mL/kg 2. What is the range of dynamic mean pressure (DMP), which reflects the effective blood pressure and the state of vascular tone? +1) 85-110 mm Hg 2) 65-85 mm Hg 3) 75-85 mm Hg 4) 110-120 mm Hg

3. What is the drug of choice for the first line of vasopressors in septic shock?

1) epinephrine
+2) norepinephrine
3) dopamine
4) vasopressin

4. When is the empirical broad-spectrum antimicrobial therapy using one or more antimicrobials in patients with manifestations of septic shock prescribed?

+1) no later than 1 hour from the moment of admission to the hospital and after microbiological inoculation of the material
2) immediately after admission to the hospital and after receiving preliminary results of microbiological culture
3) after receiving a clinical blood test and preliminary results of microbiological culture
4) no later than 4 hours after admission to the hospital and after microbiological inoculation of the material

5. What are the factors influencing the choice of the medication and regimen of empirical antimicrobial therapy?

1) spectrum of suspected pathogens depending on the location of the primary focus
2) infection/sepsis nature – community-acquired or hospital-acquired
3) the level of resistance of hospital pathogens according to microbiological monitoring
4) presence of risk factors for multidrug-resistant pathogens
5) the severity of the patient's condition and the severity of multi-organ dysfunction
+6) all of the above

6. Changes in which of the following 2 out of 3 qSOFA criteria most likely indicate sepsis?

+1) respiratory rate of 22 per minute or more, impaired consciousness, systolic blood pressure of 100 mm Hg or less
2) respiratory rate of 22 per min or more, heart rate greater than 90 per min, diuresis less than 0.5 ml/kg/h
3) impaired consciousness, heart rate more than 90 per min, leukocytosis more than 12 g/L
4) Heart rate greater than 90 per minute, leukocytosis greater than 12 g/L, systolic blood pressure of 100 mm Hg or less

7. Which of the following is a sign of hypoperfusion?

+1) acrocyanosis and marbled (mottled) skin
2) BP level below 90 mm Hg
3) heart rate over 90 per minute
4) sublingual temperature below 36°C

		8. What level of mean blood pressure achieved only with vasopressor support can be a clinical indicator of patients in septic shock? 1) 35 mm Hg 2) 45 mm Hg 3) 55 mm Hg +4) 65 mm Hg 9. What is the Hickam formula for determining the average dynamic blood pressure? +1) diastolic blood pressure + (pulse blood pressure/3) 2) (systolic BP + 2 diastolic BPs)/3 3) (systolic BP + diastolic BP)/2 4) (diastolic BP +pulse BP)/2 10. Which of the following is NOT a sign of inflammation in sepsis? +1) body temperature above 38.3˚C or below 36 ˚C 2) procalcitonin/CRP > 2 standard deviations 3) leukocytosis more than 12 g/L 4) leukopenia less than 4 g/L

8. Tests for continuous assessment on the "General aspects of anesthesiology" topic

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I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. What is included in the minimum monitoring during anesthesia? 1) constant presence of an anesthesiologist-resuscitator and a nurse-anesthetist next to the patient 2) measurement of blood pressure and heart rate at least every 5 minutes 3) continuous monitoring of oxygenation, ventilation, and blood circulation 4) continuous control of the tightness of the artificial ventilation respiratory circuit +5) all of the above 2. A patient with a diagnosis of uterine fibroids without signs of bleeding is being prepared for surgery. No concomitant diseases and systemic disorders were identified. What is the degree of

		risk according to the Gologorsky classification? 1) 2A 2) 3C +3) 1C 4) 4D 3. A 60-year-old patient with a diagnosis of acute appendicitis and local peritonitis was urgently submitted for surgery. Comorbidities: CHD, hypertension, history of ischemic stroke 2 years ago. What is the degree of risk according to the generally accepted classification? 1) 2AC 2) 3C +3) 3BC 4) 4B 4. What are the main signs that allow one to judge the depth of general anesthesia? 1) response to pain stimuli 2) depth and characteristics of breathing 3) blood circulation indicators (blood pressure, pulse, temperature and color of the skin) 4) muscle tone 5) eye symptoms (size of pupils, mobility of eyeballs; lacrimation, corneal, pupillary reflexes) 6) level of consciousness +7) all the above 5. What are the predisposing factors for aspiration? 1) elderly age 2) alcohol intoxication 3) swallowing disorders 4) dementia 5) GERD +6) all the above 6. What are the predisposing factors for gastric regurgitation? 1) fasciculations caused by suxamethonium 2) obesity 3) head injury 4) opiate premedication 5) presence of nasogastric tube +6) all the above 7. What is NOT a complication of discontinuing antihypertensive treatment a week before the surgery? 1) enhanced blood pressure response to tracheal intubation 2) myocardial ischemia during anesthesia 3) severe postoperative hypertension +4) delayed emergence from anesthesia 8. What is NOT a cause of prolonged apnea after surgery? 1) use of depolarizing relaxants over 1200 mg 2) pseudocholinesterazopenia

		3) incorrectly conducted high frequency ventilation +4) intense dehydration therapy 9. Which of the following can be expected after transferring a patient to spontaneous breathing of atmospheric air after 2 hours of anesthesia with hyperventilation? 1) indicators of gas exchange will normalize within 30 minutes 2) hypocapnia will persist for 2 hours +3) without oxygen therapy, hypoxemia is very likely to develop 4) oxygenation will not be impaired if respiratory depressants are not administered

Assessment criteria
"Very good" - more than 90% correct answers of questions of every level
"Good" - 80-89% correct answers of questions of every level
"Satisfactory" - 70-79% correct answers of questions of every level
"Unsatisfactory" - less than 70% correct answers of questions of every level

Standardized case studies and checklists for **Б1.О.36 Anesthesiology, resuscitation, and intensive care** course

Case Study No.1

	Code	**Competence description / name of labor function / name of work activity / text**
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I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** Patient A., 36 years old, was admitted to the surgical department for acute gastrointestinal bleeding with uncontrollable vomiting after binge drinking. 2 liters of monogroup blood were transfused in compliance with protocols and technical recommendations for blood transfusion. 8 hours after transfusion of blood components, a gradually increasing ARF was noted with further rapid progression. A resuscitator was called for consultation. Upon examination: the patient is disoriented, aggressive, occupies a forced position with his hands thrown back behind his head, respiratory muscles participate in the act of breathing, skin is gray-cyanotic, the respiratory rate is 35 per minute. During lung auscultation the

		attenuation of respiratory murmurs along all pulmonary fields on both sides is detected. Heart sounds are rhythmic, heart rate is 130 per minute, PS = 130 per minute. Blood pressure: 120/80 mm Hg. Radiography shows prominent pulmonary pattern and a variety of diffuse infiltrates in the lower-basal and middle parts of both lungs. In ICU: blood gas analysis results show PaO2 - 45 mm Hg; PaCO2 - 30 mm Hg. Oxygen was supplied through the nasal cannulas for 30 minutes, PaO2 remained in the range of 50-55 mm Hg.
Q	1	Question: What is your preliminary diagnosis?
Q	2	Question: Which scale can be used to judge the severity of this complication?
Q	3	Question: What are the mechanisms underlying this complication?
Q	4	Question: What measures are implemented to prevent this complication?
Q	5	Question: What urgent actions need to be taken?

Case Study No.1 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**
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		PaO2 - 45 mm Hg; PaCO2 - 30 mm Hg. Oxygen was supplied through the nasal cannulas for 30 minutes, PaO2 remained in the range of 50-55 mm Hg.
Q	1	Question: What is your preliminary diagnosis?
A		Possible answers: 1. Malory-Weiss syndrome, esophageal bleeding, stage II shock. Massive blood transfusion syndrome, non-immune mediated TRALI-syndrome, stage II respiratory failure. 2. Gastric ulcer, gastrointestinal bleeding, stage III shock. Cardiogenic pulmonary edema, stage II respiratory failure. 3. Portal hypertension syndrome, bleeding from esophageal varices. Aspiration pneumonia, stage III respiratory failure. 4. Gastric ulcer, gastrointestinal bleeding, stage II shock. Immune-mediated TRALI-syndrome, stage III respiratory failure.
R2	Very good	Correct answer (1) is given
R0	Fail	Incorrect answer (2,3,4) is given
Q	2	Question: Which scale can be used to judge the severity of this complication?
A		Possible answers: 1. SOFA 2. GLASGOW 3. LIS 4. HAS-BLED
R2	Very good	Correct answer (3) is given
R0	Fail	Incorrect answer (1,2, 4) is given
Q	3	Question: What are the mechanisms underlying this complication?
A		Possible answers: 1. the reactivity of granulocytes and/or endothelium changes due to blood loss, polytrauma, sepsis, and other critical conditions; in addition, transfusion of components of preserved blood containing lipids and/or cytokines leads to the activation of granulocytes. 2. leukoagglutination develops during transfusion of blood components containing antibodies against the recipient's leukocytes; 3. leukoagglutination develops during transfusion of blood components containing antigen against the recipient's leukocytes;
R2	Very good	Full answer given (points 1, 2 are given)
R1	Good/Satisfactory	Incomplete answer given (“Good” grade –point 1 is given “Satisfactory” grade – point 2 is given)
R0	Fail	Incorrect answer (3) is given
Q	4	Question: What measures are implemented to prevent this complication?
A		Possible answers: 1. use washed erythrocytes, prepared individually. 2. exclude from the list of donors of persons whose transfusion of blood components once caused the development

		of TRALI, as well as women who have had several pregnancies or whose blood contains antibodies to HLA upon examination 3. when deciding on transfusion of blood products, analyze the indications and contraindications, weigh the positive and negative effects of the use of blood components, predict all possible complications of blood transfusions 4. do not use blood products with long shelf life 5. use leukocyte filters to prevent HLA alloimmunization
R2	Very good	Full answer given (points 1-6 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 2, 3,4, and 5 are given "Satisfactory" grade – points 2 and 3 are given)
R0	Fail	Incorrect answer (1, 5) is given
Q	5	Question: What urgent actions need to be taken?
A		Possible answers: 1. hospitalization of the patient to the ICU, tracheal intubation, artificial ventilation, infusion and antibacterial therapy, nutritional support, analgesia, general care 2. hospitalization of the patient to the surgical department, oxygen therapy, treatment of pulmonary edema (saluretics, morphine), antibacterial therapy, nutritional support, general care 3. surgical hemostasis, hospitalization of the patient to the ICU, tracheal intubation, the concept of "safe" artificial ventilation, methods of improving the drainage function of the lungs, hemodynamic support, nutritional support, sedation and analgesia, anti-inflammatory therapy, general care
R2	Very good	Full answer given (point 3 is given)
R0	Fail	Incorrect answer (1, 2) is given

Case Study No.2

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 39 years old man was out drinking, later he returned home with paraorbital hematomas and went to bed; in the morning his relatives could not wake him up and called an ambulance. The patient does not respond to stimuli, responds to pain with a facial grimace and shoulder adduction/internal rotation. There

		is no verbal contact and the patient follow execute any commands. Paraorbital hematomas on the face. The skin is pale-cyanotic. Breathing is shallow, weakened on auscultation, conducted rales are heard along the front surface. RR – 12 per minute. Heart sounds are muffled, PS 120 per minute. BP – 150/90 mm Hg. The abdomen is soft, there is no reaction to palpation. Blood gas test results: PaO2 – 60 mm Hg, PCO2 – 57 mm Hg.
Q	1	Question: What is your preliminary diagnosis?
Q	2	Question: What must be carried out at the pre-hospital stage?
Q	3	Question: What emergency diagnostics should be carried out in a hospital to confirm the diagnosis?
Q	4	Question: What medications are used to treat cerebral edema in this situation?
Q	5	Question: At what level of ICP active measures to reduce it must be taken?

Case Study No.2 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 39 years old man was out drinking, later he returned home with paraorbital hematomas and went to bed; in the morning his relatives could not wake him up and called an ambulance. The patient does not respond to stimuli, responds to pain with a facial grimace and shoulder adduction/internal rotation. There is no verbal contact and the patient follow execute any commands. Paraorbital hematomas on the face. The skin is pale-cyanotic. Breathing is shallow, weakened on auscultation, conducted rales are heard along the front surface. RR – 12 per minute. Heart sounds are muffled, PS 120 per minute. BP – 150/90 mm Hg. The abdomen is soft, there is no reaction to palpation. Blood gas test results: PaO2 – 60 mm Hg, PCO2 – 57 mm Hg.
Q	1	Question: What is your preliminary diagnosis?
A		Possible answers: 1. Severe traumatic brain injury. Coma I. GCS 6 points. Aspiration syndrome

		2. Severe traumatic brain injury. Coma II. 3. Poisoning by alcohol surrogates. Metabolic coma. Bilateral pneumonia.
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2, 3) is given
Q	2	Question: What must be carried out at the pre-hospital stage?
A		Possible answers: 1. Perform pulse oximetry, measure blood sugar. Ensure airway patency: put the patient on his side, supply oxygen through a face mask, begin infusion of 0.9% NaCl, administer furosemide 40 mg, urgently transfer to a hospital with the ability to perform CT and neurosurgical care. 2. Perform pulse oximetry, measure blood sugar, perform an ECG. Ensure airway patency: perform intubation of the trachea and sanitation of the respiratory tract, begin artificial ventilation, raise the head end of the bed by 30°, stabilize hemodynamics: begin infusion of 0.9% NaCl, urgently transfer to a hospital with the ability to perform CT and neurosurgical care. 3. Perform pulse oximetry and ECG. Ensure airway patency: insert the nasopharyngeal airway, supply oxygen through the face mask, administer magnesium sulfate 4 g to 0.9% NaCl, furosemide 40 mg IM, urgently transfer to a toxicology department.
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1, 3) is given
Q	3	Question: What emergency diagnostics should be carried out in a hospital to confirm the diagnosis?
A		Possible answers: 1. CT scan of the brain 2. Blood sugar, blood platelets, CT scan of the brain, neck, lungs, consultation with a surgeon, traumatologist 3. X-ray of the skull, lungs, consultation with a toxicologist, blood test for alcohol and its surrogates
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1, 3) is given
Q	4	Question: What medications are used to treat cerebral edema in this situation?
A		Possible answers: 1. 3% NaCl, mannitol 2. furosemide 3. glucocorticosteroids
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2, 3) is given
Q	5	Question: At what level of ICP active measures to reduce it must be taken?
A		Possible answers: 1. 15 mm Hg 2. 18 mm Hg 3. 20 mm Hg
R2	Very good	Full answer given (point 3 is given)
R0	Fail	Incorrect answer (1, 2) is given

Case Study No.3

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** Patient B., 65 years old, was admitted to the intensive care unit with palpitations, a feeling of "a lump" in the throat, pronounced general weakness, suffocation, and a feeling of lack of air. From the anamnesis: This is the first time this condition has occurred. Coronary heart disease. Paroxysmal atrial fibrillation. Essential (primary) hypertension. Blood pressure reaches up to 180/90 mm Hg. Paraxisms occur 4-6 times a year. Regularly takes bisoprolol - 10 mg once a day and valsartan - 80 mg once a day. The patient is agitated, elements of encephalopathy are noted, occupies a forced position (orthopnea). The skin is gray, cyanotic. RR 36 per minute, wet wheezing can be heard at a distance. Upon auscultation of the lungs: harsh breath sounds, multiple bubbling rales. BP 130/80 mm Hg, heart rate – 220 per minute, PS - 140 per minute, SpO2 - 88%, ECG: no P wave, irregular rhythm, heart rate – 220 per minute. QRS complexes are narrow. Blood gas analysis results: PaO2 - 60 mm Hg, PaCO2 - 30 mm Hg. The troponin test is negative. Echocardiography results: EF 50%.
Q	1	Question: What is your diagnosis? In your opinion, what is responsible for the severity of the patient's condition?
Q	2	Question: Are there any indications for electropulse therapy? If so, please specify the type of electropulse therapy and how much energy for a shock should be selected in this situation?
Q	3	Question: What treatment activities should be carried out immediately upon admission of the patient to the intensive care unit?
Q	4	Question: What rules must be followed when conducting electropulse therapy?
Q	5	Question: Is hospitalization necessary, and if so, into which department?

Case Study No.3 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** Patient B., 65 years old, was admitted to the intensive care unit with palpitations, a feeling of "a lump" in the throat, pronounced general weakness, suffocation, and a feeling of lack of air. From the anamnesis: This is the first time this condition has occurred. Coronary heart disease. Paroxysmal atrial fibrillation. Essential (primary) hypertension. Blood pressure reaches up to 180/90 mm Hg. Paraxisms occur 4-6 times a year. Regularly takes bisoprolol - 10 mg once a day and valsartan - 80 mg once a day. The patient is agitated, elements of encephalopathy are noted, occupies a forced position (orthopnea). The skin is gray, cyanotic. RR 36 per minute, wet wheezing can be heard at a distance. Upon auscultation of the lungs: harsh breath sounds, multiple bubbling rales. BP 130/80 mm Hg, heart rate – 220 per minute, PS - 140 per minute, SpO2 - 88%, ECG: no P wave, irregular rhythm, heart rate – 220 per minute. QRS complexes are narrow. Blood gas analysis results: PaO2 - 60 mm Hg, PaCO2 - 30 mm Hg. The troponin test is negative. Echocardiography results: EF 50%.
Q	1	Question: What is your diagnosis? In your opinion, what is responsible for the severity of the patient's condition?
A		Possible answers: 1. Coronary heart disease. Paroxysmal form of atrial fibrillation. CHA2DS2-VASc - 4 points. HAS-BLED - 2 points. Acute left ventricular failure, pulmonary alveolar edema. CF 2A. Stage 3 hypertension disease, grade 3 BP, very high risk. CHF IIA stage, class II with preserved LVEF. The severity of the patient's condition can be explained by the development of paroxysm of atrial fibrillation complicated by acute left ventricular failure: hydrostatic alveolar pulmonary edema. 2. CHD. Paroxysmal form of atrial fibrillation. Stage 2 hypertension disease, grade 3 BP, high risk. CHF IIA stage, class II with preserved LVEF. The severity of the patient's condition is due to the development of paroxysm of atrial

		fibrillation. 3. Stage 3 hypertension disease, grade 3 BP, very high risk, complicated by acute left ventricular failure, cardiogenic shock. CHF IIA stage, class II with partially preserved LVEF.
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2, 3) is given
Q	2	Question: Are there any indications for electropulse therapy? If so, please specify the type of electropulse therapy and how much energy for a shock should be selected in this situation?
A		Possible answers: 1. There are no indications for electropulse therapy. 2. Indications for electropulse therapy are indirect, it can be carried out in the absence of the effect of pharmacotherapy. 3. Absolute indications for electropulse therapy: electrocardioversion, 120 J
R2	Very good	Correct answer (2) is given
R0	Fail	Incorrect answer (1, 3) is given
Q	3	Question: What treatment activities should be carried out immediately upon admission of the patient to the intensive care unit?
A		Possible answers: 1. Administer 100% humidified oxygen through inhalation; perform vagal tests, if they are ineffective, inject 10-20-30 mg of triphosadenine IV; administer 1 mg of morphine IV slowly, 40 mg of furosemide IV, nitroglycerin starting from 20 μg/min. 2. Record the ECG in informative leads for rhythm analysis (II, V1), administer 100% humidified oxygen through inhalation, ensure competent anesthesia with morphine 2-4 mg IV slowly, if necessary, perform sedation with diazepam 5 mg; conduct electrocardioversion, administer 40 mg of furosemide. 3. Administer 100% humidified oxygen through inhalation, administer amiodarone 5 mg/kg, 40 mg of furosemide IV, sodium nitroprusside 0.3-5 μg/kg/min.
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2, 3) is given
Q	4	Question: What rules must be followed when conducting electropulse therapy?
A		Possible answers: 1. Switch the defibrillator to electrocardioversion mode, make sure that the tachyarrhythmia persists, select the minimum energy of the shock, lubricate the electrodes with a gel, conduct the electrocardioversion in the expiratory phase, record the rhythm on the ECG, increase the energy by 50 J and repeat the electrocardioversion if ineffective. 2. Switch the defibrillator to electrocardioversion mode, select the minimum energy of the shock, lubricate the electrodes with a gel, conduct the electrocardioversion in the inspiratory phase, record the rhythm on the ECG, increase the energy by 50 J and repeat the electrocardioversion if ineffective. 3. Make sure there are indications for electropulse therapy, set energy of the shock to 200J, lubricate the electrodes with a gel, conduct electropulse therapy, the rhythm on the ECG, repeat

		the electropulse therapy at 200J if ineffective.
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2, 3) is given
Q	5	Question: Is hospitalization necessary, and if so, into which department?
A		Possible answers: 1. Hospitalization isn't necessary if normal cardiac rhythm is restored; the patient must seek consultation with a cardiologist of an outpatient clinic 2. Hospitalization to cardiology department is necessary if normal cardiac rhythm is not restored 3. Hospitalization to cardiology department is necessary
R2	Very good	Full answer given (point 3 is given)
R0	Fail	Incorrect answer (1, 2) is given

Case Study No.4

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 37-year-old patient was admitted to the emergency department unconscious. He was found next to a bottle of vodka and half-empty bottle of unknown liquid, which turned out to be methanol. It is unknown whether he drank anything from these bottles. Physical examination results: impaired level of consciousness, 9 points on the Glasgow Coma Scale, no focal neurological symptoms were detected. Results of blood gas test:

H^+	63,3 nmol/L
pH	7,2
PCO_2	25 mm Hg.
PO_2	96 mm Hg.
HCO_3^-	9,5 mmol/L
BE	- 16,2 mmol/L
SpO_2	97,8%
lactate	1,3
K^+	4,5 mmol/L
Na^+	136 mmol/L
Cl^-	99 mmol/L

			iCa^{2+}	1,1 mmol/L
			Hb	135 g/L
			glucose	3,8 mmol/L
Q	1	Question: What type of acid-base balance impairment developed in this patient?		
Q	2	Question: Is the acid-base balance impairment compensated, partially compensated, or decompensated?		
Q	3	Question: What is the anion gap in this case?		
Q	4	Question: If we assume that methanol poisoning took place, what, in your opinion, has caused increased anion gap?		
Q	5	Question: Is the use of sodium bicarbonate indicated in this case?		

Case Study No.4 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**		
S	31.05.01	General Medicine for international students (in English)		
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts		
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety		
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention		
F	A/01.7	Providing emergency and urgent medical care to the population		
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 37-year-old patient was admitted to the emergency department unconscious. He was found next to a bottle of vodka and half-empty bottle of unknown liquid, which turned out to be methanol. It is unknown whether he drank anything from these bottles. Physical examination results: impaired level of consciousness, 9 points on the Glasgow Coma Scale, no focal neurological symptoms were detected. Results of blood gas test:		
			H^+	63,3 nmol/L
			pH	7,2
			PCO_2	25 mm Hg.
			PO_2	96 mm Hg.
			HCO_3^-	9,5 mmol/L
			BE	- 16,2 mmol/L
			SpO_2	97,8%
			lactate	1,3
			K^+	4,5 mmol/L
			Na^+	136 mmol/L
			Cl^-	99 mmol/L
			iCa^{2+}	1,1 mmol/L
			Hb	135 g/L

			glucose	3,8 mmol/L
Q	1	Question: What type of acid-base balance impairment developed in this patient?		
A		Possible answers: 1. respiratory acidosis 2. metabolic acidosis 3. respiratory alkalosis 4. metabolic alkalosis		
R2	Very good	Full answer given (point 2 is given)		
R0	Fail	Incorrect answer (1, 3, 4) is given		
Q	2	Question: Is the acid-base balance impairment compensated, partially compensated, or decompensated?		
A		Possible answers: 1. fully compensated 2. fully decompensated 3. partially compensated		
R2	Very good	Full answer given (point 3 is given)		
R0	Fail	Incorrect answer (1, 2) is given		
Q	3	Question: What is the anion gap in this case?		
A		Possible answers: 1. 10 2. 24 3. 32 4. 40		
R2	Very good	Full answer given (point 3 is given)		
R0	Fail	Incorrect answer (1, 2) is given		
Q	4	Question: If we assume that methanol poisoning took place, what, in your opinion, has caused increased anion gap?		
A		Possible answers: 1. formate 2. glycolic acid 3. glycolaldehyde 4. salicylates		
R2	Very good	Full answer given (point 1 is given)		
R0	Fail	Incorrect answer (2, 3, 4) is given		
Q	5	Question: Is the use of sodium bicarbonate indicated in this case?		
A		Possible answers: 1. not indicated as the acid-base imbalance is not as dangerous as accumulation of toxic metabolites of methanol in blood 2. indicated in order to decrease neurotoxic effects of methanol		
R2	Very good	Full answer given (point 2 is given)		
R0	Fail	Incorrect answer (1) is given		

Case Study No.5

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and

		ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** 65-year-old patient K. has been transferred to the ICU department from the operating room 24 hours before. Diagnosis: incarcerated postoperative ventral hernia. Phlegmon of the hernial sac, generalized purulent peritonitis, severe abdominal sepsis. The following procedures have been performed in the operating room: laparotomy, resection of the hernial sac, resection of 70 cm of necrotized small intestine, sanitization and drainage of the abdominal cavity, and a laparostomy allowing for planned re-laparotomies. Treatment of severe abdominal sepsis continued in the post-operative period. Currently respiratory support is continued, patient condition: hemodynamics stable, hourly diuresis is 0.8 mL/kg/h. Signs of systemic inflammatory response remain. Maximum body temperature over the past 24 hours was 39.0 C **Physical examination results:** 1). Anthropometry results: Body weight 72 kg, height 165 cm. BMI is 26.45 2) Biochemical blood assay results: Albumin: 22 g/L Lymphocytes: $800x10^3$ per μL
Q	1	Question: Perform preliminary calculations of nutrient requirements.
Q	2	Question: Perform preliminary calculations of requirements for protein and non-protein calories.
Q	3	Question: Calculate true protein requirement.
Q	4	Question: Calculate true energy requirement.

Case Study No.5 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND**

		GIVE DETAILED ANSWERS TO THE QUESTIONS 65-year-old patient K. has been transferred to the ICU department from the operating room 24 hours before. Diagnosis: incarcerated postoperative ventral hernia. Phlegmon of the hernial sac, generalized purulent peritonitis, severe abdominal sepsis. The following procedures have been performed in the operating room: laparotomy, resection of the hernial sac, resection of 70 cm of necrotized small intestine, sanitization and drainage of the abdominal cavity, and a laparostomy allowing for planned re-laparotomies. Treatment of severe abdominal sepsis continued in the post-operative period. Currently respiratory support is continued, patient condition: hemodynamics stable, hourly diuresis is 0.8 mL/kg/h. Signs of systemic inflammatory response remain. Maximum body temperature over the past 24 hours was 39.0 C **Physical examination results:** 1). Anthropometry results: Body weight 72 kg, height 165 cm. BMI is 26.45 2) Biochemical blood assay results: Albumin: 22 g/L Lymphocytes: 800x10^3 per μL
Q	1	Question: Perform preliminary calculations of nutrient requirements.
A		Possible answers: 1. 144g of protein 2. 184g of protein 3. 124g of fats 4. 144g of fats 5. 414g of carbohydrates 6. 328g of carbohydrates
R2	Very good	Full answer given (points1, 4, and 5 are given)
R1	Good/Satisfactory	Incomplete answer given (“Good” grade –points 1, 4 are given “Satisfactory” grade – point 1 is given)
R0	Fail	Incorrect answer (2, 3, 6) is given
Q	2	Question: Perform preliminary calculations of requirements for protein and non-protein calories.
A		Possible answers: 1. 484 kcal of protein calories 2. 3211 kcal of non-protein calories 3. 576 kcal of protein calories 4. 2868 kcal of non-protein calories
R2	Very good	Full answer given (points 3,4 are given)
R1	Good/Satisfactory	Incomplete answer given (“Good” grade –point 4 is given “Satisfactory” grade – point 3 is given)
R0	Fail	Incorrect answer (1, 2) is given
Q	3	Question: Calculate true protein requirement.
A		Possible answers: 1. 112g per day 2. 122g per day

		3. 132g per day 4. 142g per day
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1, 3, 4) is given
Q	4	Question: Calculate true energy requirement.
A		Possible answers: 1. 2124 kcal per day 2. 2221 kcal per day 3. 2317 kcal per day 4. 2457 kcal per day
R2	Very good	Full answer given (point 3 is given)
R0	Fail	Incorrect answer (1, 2, 4) is given

Case Study No.6

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** 52-year-old patient S. has been admitted to a hospital after prolonged consumption of strong liquor. Jaundice and swelling of the lower limbs over the previous 2 months have been noted. The patient periodically noted skin pruritus (itchiness). Sleep disturbances manifested a week before hospitalization. During the examination: severe condition, the patient is slow to respond, answers questions with pauses and in short words only. Also noted are tremor of the hands, icteric skin and sclera, hyperemia of the thenar and hypothenar areas of both palms. There are spider veins and scratch marks on the upper half of the trunk and back. Unpleasant somewhat sweet odor is coming from the mouth. Breathing is independent, respiratory rate is 24 per minute, prolonged noisy expiration. Heart sounds are muffled, rhythmic. BP – 85/40 mm Hg, pulse – 96 beats per minute. The abdomen is enlarged due to free fluid, painless on palpation. The lower edge of the liver protrudes from under the edge of the costal arch by 6 cm. Biochemical blood assay results: total protein – 54 g/L, albumin – 26 g/L, PI - 44%, total bilirubin – 233 mmol/L, AST – 310 U/L, AST – 180 U/L, GGT – 285 U/L. Ultrasound results: signs of liver cirrhosis; on EGD – varicose veins of the esophagus of the 2nd degree.

Q	1	Question: What is the cause of the severity of the patient's condition?
Q	2	Question: What is the stage of hepatic encephalopathy in this case?
Q	3	Question: What are the main syndromes accompanying liver failure in this patient?
Q	4	Question: What diagnostic procedures can be carried out to clarify the prognosis and determine the severity of the disease?
Q	5	Question: What pharmacotherapy is indicated for this patient?

Case Study No.6 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** 52-year-old patient S. has been admitted to a hospital after prolonged consumption of strong liquor. Jaundice and swelling of the lower limbs over the previous 2 months have been noted. The patient periodically noted skin pruritus (itchiness). Sleep disturbances manifested a week before hospitalization. During the examination: severe condition, the patient is slow to respond, answers questions with pauses and in short words only. Also noted are tremor of the hands, icteric skin and sclera, hyperemia of the thenar and hypothenar areas of both palms. There are spider veins and scratch marks on the upper half of the trunk and back. Unpleasant somewhat sweet odor is coming from the mouth. Breathing is independent, respiratory rate is 24 per minute, prolonged noisy expiration. Heart sounds are muffled, rhythmic. BP – 85/40 mm Hg, pulse – 96 beats per minute. The abdomen is enlarged due to free fluid, painless on palpation. The lower edge of the liver protrudes from under the edge of the costal arch by 6 cm. Biochemical blood assay results: total protein – 54 g/L, albumin – 26 g/L, PI - 44%, total bilirubin – 233 mmol/L, AST – 310 U/L, AST – 180 U/L, GGT – 285 U/L. Ultrasound results: signs of liver cirrhosis; on EGD – varicose veins of the esophagus of the 2nd degree.
Q	1	Question: What is the cause of the severity of the patient's condition?
A		Possible answers:

		1. Development of liver failure; 2. Development of hepatic encephalopathy; 3. Portal hypertension syndrome; 4. Unstable hemodynamics; 5. Acute renal failure.
R2	Very good	Full answer given (points 1,2,3,4 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 1,2,3 / 2,3,4 / 1,3,4 are given "Satisfactory" grade – points 1,2 / 2,3 / 3,4 / 1,3 / 1,4 / 2,4 are given)
R0	Fail	Incorrect answer (5) is given
Q	2	Question: What is the stage of hepatic encephalopathy in this case?
A		Possible answers: 1. Subclinical stage; 2. Grade I (excitation); 3. Grade II (somnolence); 4. Grade III (stupor); 5. Grade IV (coma).
R2	Very good	Full answer given (point 3 is given)
R0	Fail	Incorrect answer (1,2, 4, 5) is given
Q	3	Question: What are the main syndromes accompanying liver failure in this patient?
A		Possible answers: 1. Cytolytic syndrome; 2. Liver cell failure syndrome; 3. Portal hypertension syndrome; 4. Cardiovascular insufficiency syndrome; 5. Hepatorenal syndrome.
R2	Very good	Full answer given (points 1,2,3,4 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 1,2,3 / 2,3,4 / 1,3,4are given "Satisfactory" grade – points 1,2 / 2,3 / 3,4 / 1,3 / 1,4 / 2,4 are given)
R0	Fail	Incorrect answer (5) is given
Q	4	Question: What diagnostic procedures can be carried out to clarify the prognosis and determine the severity of the disease?
A		Possible answers: 1. Radionuclide scanning 2. Magnetic Resonance Imaging (MRI scan) 3. Esophagogastroduodenoscopy 4. Liver biopsy 5. Exploratory laparoscopy
R2	Very good	Full answer given (points 1,2,3,4 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 1,2,3 / 2,3,4 / 1,3,4 are given "Satisfactory" grade – points 1,2 / 2,3 / 3,4 / 1,3 / 1,4 / 2,4 are given)
R0	Fail	Incorrect answer (5) is given
Q	5	Question: What pharmacotherapy is indicated for this patient?
A		Possible answers:

		1. Absorbable antibiotics, 2. Sodium benzoate, phenyl acetate 3. L-ornithine-L-aspartate (Hepa-Mertz), 4. Hepasol A
R2	Very good	Correct answer (3) is given
R0	Fail	Incorrect answer (1, 2, 4) is given

Case Study No.7

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 50-year-old man (weight 90 kg) fell ill acutely 6 days ago with fever up to 39°C, general weakness. Patient experienced pulling pains in the lower back, a decrease in the amount of urine, thirst, dry mouth, nausea, and vomiting. Anamnesis: the patient had visited his summer house and was cleaning the cellar there. Physical examination results: the condition is severe, the patient answers questions with a delay and short words only; the skin is of normal color, marbled (mottled) on the feet and hands, there are multiple petechiae in the inner areas of the elbows and on the shoulder after measuring blood pressure, sclera appear red. Harsh breathing sounds over both sides of the lungs, weakened in the lower parts, RR – 22 per minute, heart tones are muffled, BP – 60/40 mm Hg, pulse 126 per minute. The abdomen is soft, there are no symptoms of peritoneal irritation. The kidney area is not changed, the kidney punch (costovertebral angle tenderness) symptom is positive on both sides. Ultrasound results: enlargement of the renal parenchyma. Complete Blood Count results: RBCs - 4.5 T/L, Hb - 141 g/L, leukocytes – 41 g/L, band cells - 12. Biochemical blood assay results: creatinine - 609 μmol/L, urea 33 mmol/L, ALT – 45 U/L, AST – 166 U/L, K – 6.3 mmol/L, Na – 135 mmol/L, lactate – 4.2 mmol/L. Procalcitonin test: >0.5. pH – 7.25. On the ECG: sinus rhythm, tachyarrhythmia, heart rate 126, QRS <0.12, tall T wave. Hantavirus antibody titer 1:2048
Q	1	Question: What disease caused the development of a critical condition?
Q	2	Question: What is the cause of the severity of the patient's condition?
Q	3	Question: What is the AKIN stage and RIFLE grade of this

		patient?
Q	4	Question: What are the absolute indications for hemodialysis?
Q	5	Question: What measures should be taken if hyperkalemia is detected?

Case Study No.7 Checklist

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
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I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** A 50-year-old man (weight 90 kg) fell ill acutely 6 days ago with fever up to 39°C, general weakness. Patient experienced pulling pains in the lower back, a decrease in the amount of urine, thirst, dry mouth, nausea, and vomiting. Anamnesis: the patient had visited his summer house and was cleaning the cellar there. Physical examination results: the condition is severe, the patient answers questions with a delay and short words only; the skin is of normal color, marbled (mottled) on the feet and hands, there are multiple petechiae in the inner areas of the elbows and on the shoulder after measuring blood pressure, sclera appear red. Harsh breathing sounds over both sides of the lungs, weakened in the lower parts, RR – 22 per minute, heart tones are muffled, BP – 60/40 mm Hg, pulse 126 per minute. The abdomen is soft, there are no symptoms of peritoneal irritation. The kidney area is not changed, the kidney punch (costovertebral angle tenderness) symptom is positive on both sides. Ultrasound results: enlargement of the renal parenchyma. Complete Blood Count results: RBCs - 4.5 T/L, Hb - 141 g/L, leukocytes – 41 g/L, band cells - 12. Biochemical blood assay results: creatinine - 609 μmol/L, urea 33 mmol/L, ALT – 45 U/L, AST – 166 U/L, K – 6.3 mmol/L, Na – 135 mmol/L, lactate – 4.2 mmol/L. Procalcitonin test: >0.5. pH – 7.25. On the ECG: sinus rhythm, tachyarrhythmia, heart rate 126, QRS <0.12, tall T wave. Hantavirus antibody titer 1:2048
Q	1	Question: What disease caused the development of a critical condition?
A		Possible answers: 1. Severe hemorrhagic fever with renal syndrome. 2. Bilateral polysegmental pneumonia 3. Acute pyelonephritis
R2	Very good	Full answer given (point 1 is given)

R0	Fail	Incorrect answer (2, 3) is given
Q	2	Question: What is the cause of the severity of the patient's condition?
A		Possible answers: 1. Development of hypovolemic shock 2. Acute renal injury, MODS, septic shock 3. Acute respiratory and cardiovascular insufficiency
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1,3) is given
Q	3	Question: What is the AKIN stage and RIFLE grade of this patient?
A		Possible answers: 1. AKIN stage 2, RIFLE grade I 2. AKIN stage 3, RIFLE grade F 3. AKIN stage 1, RIFLE grade R
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1,3) is given
Q	4	Question: What are the absolute indications for hemodialysis?
A		Possible answers: 1. Acidosis pH<7.15; hypervolemia: risk of cerebral and pulmonary edema that do not respond to treatment with diuretics, hyperkalaemia>6 mmol/L and electrocardiographic changes, urea >35.7 mmol/L, hypermagnesaemia>4 mmol/L with anuria and no deep tendon reflexes 2. Hyperkalaemia>6 mmol/L; acidosis pH<7.35; urea >27.0 mmol/L, hypervolemia responsive to treatment with diuretics 3. Oliguria/anuria KDIGO stage III, sodium imbalance, hypermagnesemia>3 mmol/L
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2,3) is given
Q	5	Question: What measures should be taken if hyperkalemia is detected?
A		Possible answers: 1. Calcium gluconate 10% - 30.0 or calcium chloride 10% - 10.0 IV (bolus), repeated if necessary 2. 10 IU IV or 0.1 IU/kg of body weight, up to 10 IU 3. salbutamol or albuterol 5-20 mg via nebulizer 4. furosemide 40-60 mg IV 5. hemodialysis 6. NaCl 0.45%
R2	Very good	Full answer given (points 1,2,3,4,5 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 1,2,5 are given "Satisfactory" grade – point 5 is given)
R0	Fail	Incorrect answer (6) is given

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** The patient, 52 years old, is in the ICU ward after surgery for intestinal obstruction. The patient woke up 30 minutes after the surgery. Physical examination results: decreased alertness, no reaction, the skin is warm, there is no acrocyanosis. Artificial ventilation continues. Heart rate 110 per minute, blood pressure 120/90 mm Hg. Blood gas test results and acid-base balance characteristics: PaO2 75 mm Hg, PaCO2 23 mm Hg, $FetCO_2$ 20 mm Hg, pH 7.51, BE(+) 4 mmol/L.
Q	1	Question: What caused the acid-base imbalance?
Q	2	Question: What type of acid-base balance impairment developed in this patient?
Q	3	Question: What is the cause of impaired consciousness?
Q	4	Question: What diagnostic techniques should have been used during anesthesia?
Q	5	Question: Where should the patient be hospitalized to?

Case Study No.8 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	UC-8	Is able to create and maintain safe living conditions and workplace while preserving the natural environment and ensuring sustainable societal development, including under the danger and occurrence of emergencies or military conflicts
C	GPC-7	Is able to prescribe treatment and monitor its efficacy and safety
C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention
F	A/01.7	Providing emergency and urgent medical care to the population
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS** The patient, 52 years old, is in the ICU ward after surgery for intestinal obstruction. The patient woke up 30 minutes after the surgery. Physical examination results: decreased alertness, no

		reaction, the skin is warm, there is no acrocyanosis. Artificial ventilation continues. Heart rate 110 per minute, blood pressure 120/90 mm Hg. Blood gas test results and acid-base balance characteristics: PaO2 75 mm Hg, PaCO2 23 mm Hg, $FetCO_2$ 20 mm Hg, pH 7.51, BE(+) 4 mmol/L.
Q	1	Question: What caused the acid-base imbalance?
A		Possible answers: 1. Hypoventilation 2. Hyperventilation 3. Metabolic acidosis 4. Metabolic alkalosis
R2	Very good	Full answer given (point 2 is given)
R0	Fail	Incorrect answer (1, 3, 4) is given
Q	2	Question: What type of acid-base balance impairment developed in this patient?
A		Possible answers: 1. Decompensated respiratory alkalosis 2. Subcompensated respiratory alkalosis 3. Subcompensated respiratory acidosis 4. Decompensated respiratory acidosis
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2,3, 4) is given
Q	3	Question: What is the cause of impaired consciousness?
A		Possible answers: 1. Cerebral ischemia 2. Cerebral hyperemia 3. Cerebral vasospasm 4. Dilation of cerebral vessels 5. Hypocapnia 6. Hypercapnia
R2	Very good	Full answer given (points 1,3,5 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –points 3,5 are given "Satisfactory" grade – point 5 is given)
R0	Fail	Incorrect answer (2,4,6) is given
Q	4	Question: What diagnostic techniques should have been used during anesthesia?
A		Possible answers: 1. Pulse oximetry 2. Capnometry 3. Blood gas test of arterial or capillary blood 4. Complete blood count 5. Biochemical blood assay
R2	Very good	Full answer given (points 2, 3 are given)
R1	Good/Satisfactory	Incomplete answer given ("Good" grade –point 3 is given "Satisfactory" grade – point 2 is given)
R0	Fail	Incorrect answer (4,5) is given
Q	5	Question: Where should the patient be hospitalized to?
A		Possible answers: 1. Extubateand transfer to the surgery department

		2. Extubate and transfer to the gastroenterology department 3. Leave on extended artificial ventilation in intensive care unit under observation
R2	Very good	Full answer given (point 1 is given)
R0	Fail	Incorrect answer (2,3) is given

4. Assessment criteria for learning outcomes

"Pass" is given to a student who has shown a sufficiently strong knowledge of the basic concepts of the subject; is able to complete specific practical tasks outlined in the program with no outside help, use recommended reference material, and correctly evaluate the results.

"Fail" is given to a student who has significant gaps in knowledge of the basic concepts of the subject, is not able reach the correct solution to a specific practical task outlined in the curriculum even with outside help.

Appendix 1

Practical Skills Assessment Checklist

Practical Skill Name "Cardioversion in patients with tachyarrhythmia accompanied by hemodynamic impairment"

C	PC-1	Ability and readiness to provide emergency medical care in conditions requiring urgent medical intervention		
F	A/01.7	Providing emergency and urgent medical care to the population		
WA	Work activities as part of the function: Identifying life-threatening conditions, including clinical death (cessation of vital functions, i.e. blood circulation and/or respiration), that require urgent medical aid. Providing urgent medical aid to patients experiencing Identifying life-threatening conditions, including clinical death (cessation of vital functions, i.e. blood circulation and/or respiration).			
	Action		Performed	Not Performed
1.	Assess the degree of environmental hazard for electrical pulse therapy		1 point	-1 point
2.	Turn the defibrillator on		1 point	-1 point
3.	Apply the electrodes according to the scheme and began recording the ECG		1 point	-1 point
4.	Set the energy of the shock from 100 to 200 J depending on the type of tachyarrhythmia		1 point	-1 point
5.	Turn on synchronization mode		1 point	-1 point
6.	Allow the defibrillator to build up the charge		1 point	-1 point
7.	Announce the "Stand clear!" safety command		1 point	-1 point
8.	Visually make sure that no one is touching the patient		1 point	-1 point
9.	Say the "Clear!" command and administered the shock		1 point	-1 point
10.	Evaluate the rhythm after administering the shock		1 point	-1 point
	Total		10 points	

Assessment criteria:

"Pass" - at least 75% of required actions performed

"Fail" - 74% of required actions or less performed