

ANESTHEZIOLOGY AND INTENSIVE CARE

**Curriculum for EDA preparatory course
for Anesthesiology and Intensive care residents**

Chisinau 2011

	Subjects	Activities
1	Clinical Physiology and Physiopathology in Anesthesiology (Cojocaru)	
1.	<p>Physiology and pathophysiology of respiration. Anatomy. Mechanics of breathing. Lung volumes. Pulmonary compliance. Resistance to flow. The work of breathing. Dead space. Pulmonary circulation. Alveolar ventilation. Distribution of ventilation and the ratio V / Q. Pulmonary shunt. Breath control. Central control. Peripheral chemoreceptors. Respiratory reflexes. The exchange of gases (oxygen, carbon dioxide). Transport of respiratory gases in blood. Influence of anesthesia on respiration. (Control of breathing, mechanical ventilation, compared ventilation / perfusion, transport of gases and gas exchange). Unrespiratory lung function (acid-base balance, metabolism, filtration). Mechanisms of pulmonary dysfunction and respiratory insufficiency. Clinical interpretation. Clinical diagnostic algorithm. Comprehensive functional analysis. Principles of complex treatment and functional correction.</p>	<ol style="list-style-type: none"> 1. Interpretation of pulmonary function tests. 2. Measurement of lung volumes and capacities. 3. Monitoring of airway pressure. 4. Interpretation of gas and acid-base balance. 5. Oxygen therapy.
2	<p>Physiology and pathophysiology of the cardio-vascular system. Periferal vascular system. Regulation of periferal circulation. Autonomic nervous system. Control of the blood pressure. Microcirculation and terminal circulation. Laws of flow in the vascular system. Vascular resistance. Properties of the circulating blood. The exchange of substances and liquids in the microcirculation. Regulation of the circulation: local, humoral, nervous. Heart. Electrophysiology of the heart. Cardiac cycle. Coronary circulation. Cardiac output and heart performance. Assessment of the cardiac performance. Cardiovascular response to anesthetics in pathological conditions (heart failure, coronary heart disease, arrhythmias, effects of drugs and anesthetics, sympathetic activity, ventilation, surgical stimulation, epidural and spinal anesthesia).</p>	<ol style="list-style-type: none"> 1. Cardio-vascular non-invasive monitoring. 2. Installing of peripheral arterial line for invasive monitoring. 3. Invasive blood pressure monitoring. 4. ECG monitoring and interpretation (in derivatives, ST segment analysis, detection of the arrhythmias,etc...). 5. Monitoring and calculation of cardiac output. 6. Interpretation of echocardiogram Doppler.
	<p>Methods for cardiovascular monitoring. Functional disorders of the cardiovascular system and their clinical interpretation. Clinical diagnostic algorithm. Clinical and functional complex analysis. Principles of treatment and correction.</p>	

3	<p>Physiology and pathophysiology of the renal system. Basics of the anatomy and renal morphology. Glomerular filtration mechanism. Tubular reabsorption and secretion. Renal function tests. Methods of exploration. Mechanisms of functional disorders. Hepatorenal syndrome. Clinical diagnostic algorithm. Principles of treatment and correction.</p>	<ol style="list-style-type: none"> 1. Diuresis monitoring. 2. Interpretation of urine tests. 3. Interpretation of renal function tests.
4	<p>Physiology and pathophysiology of the liver. Anatomy. Liver metabolism. Methods of exploration. Indices, parameters, functional characteristics. Pathophysiology of cholestasis syndrome. Cholestatic syndrome. Disorders of the substance exchange due to liver failure. Portal hypertension, ascites. Clinical diagnostic algorithm. Principles of treatment and correction. Systematic analysis of the effectiveness of the treatment.</p>	<ol style="list-style-type: none"> 1. Analysis of biochemical liver function tests, interpretation, diagnosis.
5	<p>Physiology and pathophysiology of the endocrine system. Clinical exploration methods. Mechanisms of disturbance of the neuroendocrine system function. Clinical forms. Pathogenesis of hypo- and hypertireosis. Pathogenesis of adrenal hormone secretion disturbance. Pathogenesis of hyper- and hypocalcemia. Clinical and diagnostic algorithm. Principles of treatment and correction.</p>	<ol style="list-style-type: none"> 1. Interpretation of laboratory investigations of the thyroid gland. 2. Interpreting the clinical context of the specific tests of the adrenal gland.
6	<p>Maternal and neonatal physiology. Physiology of pregnancy. Haemodynamic changes. Changes in breathing. Gastrointestinal changes. Non-placental endocrinological changes. Blood changes. Coagulation. Nervous system. Immunity. Anesthetic implications. Uteroplacental blood flow. Implications of anesthetic techniques, anesthetic effect on uterine flow. Placenta. Placental transfer of drugs. Physico-chemical characteristics depending on placental transfer. Placental transfer of anesthetics. Fetus. The first breath and circulation changes. Influence of the drugs on the fetus. Evaluation of the influence of drugs on the fetus.</p>	
7	<p>Child physiology. Notions of anatomy and physiology. Respiratory physiology. Cardiovascular physiology. Renal function and water balance. Fluid therapy. Replacement of blood loss. Thermoregulation. Monitoring. Liver function. Central and autonomic nervous system.</p>	

8	<p>Physiology and pathophysiology of the nervous system. The structure and functions. Membrane structure and transmembrane electric potential. Propagation of impulses through the axons. Synaptic transmission. Neurotransmitters. Receptors and intracellular communication. Somato-sensory and motor system. Autonomic nervous system. Brain physiology. Intracranial pressure. Cerebral perfusion pressure. Blood-brain barrier. Epileptogenesis. Cerebral blood flow. Regulation of the cerebral blood flow. Effects of anesthetics on cerebral blood flow and cerebral metabolism. Cerebral physiopathology. Cerebral ischemia. Intracranial hypertension. Cranio-cerebral trauma. Coma and epilepsy.</p>	<ol style="list-style-type: none"> 1. EEG monitoring and interpretation. 2. CT and MRI interpretation. 3. Assessment of the consciousness, state of coma. 4. Application and interpretation of brain stem scale (scale Pittsburgh). 5. Neurological examination of a patient. 6. Diagnosis of brain death. 7. Diagnostic lumbar puncture. 8. Monitoring of intracranial pressure. 9. Application of hypothermia.
9	<p>Pain. Physiological mechanisms of the development and installation. Spinal pain level. Nociceptiv-antinociceptive theory. Classification of pain. Nociceptive pain. Neuropathic pain. Psychogenic pain. Algometry. Acute pain and chronic pain. Principles of the clinical treatment of pain.</p>	<ol style="list-style-type: none"> 1. Practical methods of pain assessment.

II	Pharmacology in anesthesiology and intensive care (Cojocar)	Activities
1	<p>Principles of pharmacology. Physico-chemical properties. Receptors. Link drug - receptor. Theories of the drug-receptor interactions. Absorption of the drug. Bioavailability. Distribution. Biotransformation. Oxidation. Hydrolysis. Conjugation. Elimination. Methods of drug administration. Drug interactions. Inhaled anesthetics. Mechanism of action. The power of action.</p>	
2	<p>Inhalation anesthetics - chemical characteristics, physics, pharmacology of the diethyl ether, halogenated anesthetics, nitrous oxide. Techniques of the inhalation anesthesia. Characterization of the clinical effects. Indications, contraindications and complications. Prevention and correction of the complication.</p>	<ol style="list-style-type: none"> 1. Anesthesia with halothane. 2. Isofluran anesthesia. 3. Anesthesia with sevoflurane.

3	Intravenous anesthetics. Pharmacology of intravenous anesthetics. Chemical characterization, physics, pharmacology of barbiturates, benzodiazepines, phenol derivatives, imidazole, etc. fenilciclidină. Toxicity of intravenous anesthetics. Allergic reactions in anesthesia. Clinical manifestations and treatment principles.	<ol style="list-style-type: none"> 1. Anesthesia with barbiturates. 2. Anesthesia with propofol. 3. Sedation with propofol in intensive care.
4	Opioids - pharmacology and physico - chemical characteristics of the central analgetics: exogenous natural, semisynthetic, synthetic derivatives, agonists, antagonists, partial agonist, derivatives of salicylic acid and aniline, etc..	<ol style="list-style-type: none"> 1. Fentanyl anesthesia. 2. Analgesia with morphine. 3. Opioid administration in automatic syringe.
5	Neuromuscular-blocking drugs – chemical characteristics, physics, pharmacology of neuromuscular relaxants. Mode of action and clinical applications. Characterization depolarizing, nondepolarizing (competitive type) and central blockers. Clinical characterization of neuromuscular block. Decurarization. Influence of other drugs on the neuromuscular block. Features of the pharmacodynamics and pharmacokinetics of relaxants in various clinical situations (hepato-renal failure, myasthenia, malignant hyperthermia)	<ol style="list-style-type: none"> 1. Use of the depolarizing neuromuscular blockers. 2. Use of nondepolarizing neuromuscular blockers. 3. Use of decurarisation drugs.
6	Autonomic nervous system - functional anatomy. Clinical pharmacology of autonomic nervous system. Ganglioplegical blockers. Anticholinesterazics. Anticholinergics. Adrenergic agonists. Alpha-antagonists. Beta-antagonists. Mixed antagonists. Calcium blockers. Simpaticolytics. Vasodilators. Clinical use.	<ol style="list-style-type: none"> 1. Administration of the preparations in bolus with automatic syringe and continuous infusion. 2. Use of the ganglioplegical blockers. 3. Use of the anticholinesterazics. 4. Use of the anticholinergics. 5. Use of adrenergic agonists, alpha - antagonists, beta - antagonists, mixed anta-gonists. 6. Use of calcium channel blockers. 7. Use of simpaticolytics. 8. Use of vasodilator drugs.
7	Drugs used in anesthesia. Drugs with the influence on the digestive tract. Antacids. Drugs affecting secretion. Antiemetics and prokinetics. Bronchodilators. Drugs with the influence on the cardiovascular system. Diuretics. Cardiac glycosides. Vasodilators. Antiarrhythmics. Drugs acting on the immune system. Corticosteroids. Antihistamine drugs.	<ol style="list-style-type: none"> 1. Route of the administration of the drugs used in anesthesia. 2. Administration of the cardiovascular drugs during anesthesia.
8	Local anesthetics – pharmacological, physico-chemical and clinical characteristics. Anesthesia management theory. Physiological factors influencing the blocks. Pharmacokinetics of the drugs depending on the method of use.	<ol style="list-style-type: none"> 1. Use of local anesthetics in the local anesthetic infiltration. 2. Use of local anesthetics in regional anesthesia.

III	PHYSICS IN ANESTHESIOLOGY (Cazacu)	Activities
1	Terms of physics in anesthesia. The states of aggregation of the substance. Ideal gas. Critical temperature. Fluid pressure measurement. Gases. Liquids. Fluid flow. Measurement of gas volumes. Measurement of gas flow. Liquid flow measurement. Heat and temperature. Vaporization and vaporizers. Solubility. Diffusion and osmosis. Moisture and humidification. Electricity. Fires and explosions.	
2	Anesthesia equipment - anesthetic equipment, anesthetic circuit. Clinical physiology of the anesthetic circuit. Central gas installation. Pressure reducers. Flow. Vaporizers. Classification of the vaporizers. Peculiarities of contemporary anesthesia machines in conjunction with its security. Complications due to anesthesia machines and their prevention. Anesthetic monitoring.	<ol style="list-style-type: none"> 1. Installation of the anesthesia machine. 2. Control of pressure reducers. 3. Check of the anesthesia machine.
3.	Anesthetic breathing systems. The components of the respiratory system. Classification of the anesthetic breathing systems. Criteria. Breathing systems used in the absence of medical gases. Respiratory systems usable only with medical gases. Mapleson circuits .. Respiratory valve systems. Humphrey systems. Breathing system with soda lime.	<ol style="list-style-type: none"> 1. ECG Monitoring 2. Monitoring with pulse oximetry. 3. Monitoring with capnography.
4.	The environment of the anesthesiologist. Surgery unit, patient handling, operating room, safety in the operating room, room of awakening, other rooms for the anesthesia.	4. Noninvasive and invasive BP monitoring.
5.	Intraanesthetic monitoring - influence of the anesthesia and analgesia on the central nervous system, autonomic, cardiovascular, respiratory, hepatorenal, digestive, endocrine, metabolic, etc., functions. Need of the monitoring in anesthesia. Clinical algorithm - highlighting the physiological effects of anesthetics.	<ol style="list-style-type: none"> 5. PVC Monitoring 6. Monitoring pulmonary capillary pressure and cardiac output 7. Monitoring diuresis. 8. Central and peripheral temperature monitoring.
6.	The legal basis. Mortality related to anesthesia, anesthesia-related diseases.	

IV	PRINCIPLES OF THE ANESTHESIOLOGY ASSISTANCE	Activities
1	Preoperative Assessment and Premedication – perianestezic – perioperative period. Complex methods of the exploration of the patient. Identification of the anesthetic and surgical risks. Preparing the patient for anesthesia and surgery. Premedication. Forms. Indications. Complications and its treatment.	<ol style="list-style-type: none"> 1. Preanestezic examination of the patient. 2. Assessment of the anesthetic risks. 3. Premedication (per os, i.m., i.v.,) 4. Positioning the patient on the operating table....
2	Surgical stress. Methods of blocking of nociceptive impulsations. The body's protective mechanisms for surgery. Definition of anesthetic aggression and physiological expression. Anesthetic efficacy criteria.	
3	Anesthesia in relation to coexisting diseases. Anaesthesia in patient with cardiovascular disease. Anaesthesia in patient with pulmonary disease. Anaesthesia in patient with gastrointestinal disease. Anaesthesia in patient with liver disease. Anaesthesia in patient with biliary tract diseases. Anaesthesia in patient with pancreatic disease. Anaesthesia in patient with kidney disease. Anaesthesia in patient with hematological disorders. Anaesthesia in patient with connective tissue diseases. Anaesthesia in patients with drug addiction.	<ol style="list-style-type: none"> 1. Preanestezic examination of the patient with cardiovascular pathology. 2. Preanestezic examination of the patient with respiratory pathology. 3. Preanestezic examination of the patient with endocrine pathology.
4	General anesthesia techniques. Periods of anesthesia. Position of the patient on the operating table and its importance for anesthesia. Induction. Induction methods. Induction technique. Accidents, incidents and complications at induction. Maintenance of anesthesia. Methods, techniques. Incidents, accidents and complications during maintenance of the anesthesia. Awakening from anesthesia. Technique, incidents and complications. Postanestezic immediate period.	<ol style="list-style-type: none"> 1. Tracheal intubation (oro-tracheal, nazo-tracheal) 2. Total intravenous anesthesia (TIVA) 3. Intravenous induction. 4. Inhaled induction. 5. Installing of the gastric tube.
5	Risks of general anesthesia errors: premedication, induction, maintenance and awakening. Complications induced by intravenous and inhalation anesthetics. Accidents and incidents of respiratory, cardiovascular, homeostasis, etc..systems. Explosions, fire, defects of anesthesia equipment and of artificial ventilation in anesthesia.	
6	Respiratory track approach. Anatomy of upper respiratory track. The necessary equipment. Tracheal intubation. Indications for tracheal and bronchial intubation. Techniques. Methods. Difficult intubation. Incidents, accidents and complications, their prevention. Physiological reflexes of the airways.	<ol style="list-style-type: none"> 1. Tracheal intubation (oro-tracheal, naso-tracheal) 2. Selective bronchial intubation. 3. Tracheal intubation with fibrobronchoscope. 4. Application of laryngeal mask.

7	Venous and arterial line approach - central and peripheral. Subclavian catheterization. Jugular catheterization. Femoral catheterization. Peripheral venous catheterization. Arterial percutaneous cannulation techniques – radial artery. Indications, contraindications and complications.	<ol style="list-style-type: none"> 1. Installation of peripheral venous line. 2. Installation of central venous line. 3. Installation of the arterial line for BP monitoring.
8	General anesthesia complications - arrhythmias, hypotension, hypertension, hypervolaemia. Cardiac ischemia, cardiac arrest, embolism (gaseous, thrombosis, etc.), hypoxemia, hypercapny, hypocapny, respiratory obstruction, problems with intubation, gastric contents aspiration, drug effects, etc.. Hypothermia, hyperthermia, presence of the patient during anesthesia. Problems with anesthesiological equipment.	<ol style="list-style-type: none"> 1. ECG monitoring and correction of arrhythmias. 2. Correction of hypertension during anesthesia.

V	General Intensive Care(Cojocaru)	Activities
1	Intensive care unit. Criteria for admission to the intensive care unit. Department personnel. The role of intensive care unit doctor. Evaluation of the patient. Clinical orientation data.	<ol style="list-style-type: none"> 1. Maintaining of the airway in intubated, unconscious, paralyzed patients. 2. Tracheal intubation (oral, nasal)
	Respiratory problems. Installation of mechanical ventilation in intensive care patient. Withdrawal of the mechanical ventilation. Adult respiratory distress syndrome. Cardiovascular failure. Cardiovascular monitoring. Septic syndrome. Renal failure. Mortality in intensive care.	<ol style="list-style-type: none"> 3. Cricotirotomy, transtracheal catheterization, percutaneous mini-tracheostomia. 4. Central and peripheral temperature monitoring. 5. Aspiration techniques. 6. Physiotherapy and spirometry techniques. 7. Use of mechanical ventilation equipment. 8. Indications, applications, techniques and physiological effects of PEEP, IMV, SIMV, PSV, BIPAP, CPAP, high frequency ventilation. 9. Techniques for the mechanical ventilation withdrawal. 10. Peripheral vessel catheterization (arterial and venous) 11. Central vessels catheterisation(jugular, subclavian, femoral)

2	<p>Acid-base and gas balance. Elements of the acids and bases chemistry. Terms of pH, buffer solutions, acids and bases. Physiology of acid-base balance. Acid-base terminology. Measurement of acid-base parameters. Compensation of acid-base disturbances. Metabolic disturbances of acid-base balance. Metabolic acidosis. Metabolic alkalosis. Respiratory disturbances of acid-base balance. Respiratory acidosis. Respiratory alkalosis.</p>	<ol style="list-style-type: none"> 1. Use of blood gas analyzer. 2. Interpretation of acid-base metabolism by Astrup test, clinical interpretation, principles of correction. 3. Analysis of gas metabolism, interpretation in the clinical context.
3	<p>Fluid , electrolyte balance. General problems of internal environment structure. Water - life environment. Fluids in the body. Ionic exchanges between compartments. Control of volume homeostasis and osmolality of the fluid sectors. Pathology of hydro-ionic sectors. Intrinsic pathology. Specific pathological situations which generate disturbances in the fluid sectors. Therapy of fluid and electrolyte dysbalances. Underlying disease therapy .. Maintenance therapy.</p>	<ol style="list-style-type: none"> 1. Assessment of fluid balance, the calculation of the necessary physiological fluid requirements of a patient in intensive care on the basis of existing disease. 2. Interpretation of electrolyte dysbalances, and principles of correction.
4	<p>Physiological and pathological hemostasis. General terms. Evaluation of bleeding tendency. Hemostatic abnormalities. Hemostatic abnormalities related to blood platelets. Coagulation disorder itself. Coagulation mechanism. Congenital abnormalities of coagulation. Acquired abnormalities of coagulation. Hypercoagulable state. Anticoagulant therapy.</p>	<ol style="list-style-type: none"> 1. Evaluation of bleeding tendency 2. Massive transfusion. 3. Use of the blood components. 4. Autotransfusion. 5. Indication, collection and interpretation of coagulation test results. 6. Carbohemoperfusion. 7. Plasmoferesis.
5	<p>Nutrition of critically ill patient. Assessment of nutritional status of the critically ill patient. Neuro-endocrine-immune response to stress. Metabolic response to stress. Means of assessing nutritional status. Artificial nutrition techniques. Enteral nutrition. Parenteral nutrition. Mixed nutrition. Nutritional needs of critically ill patient. Evaluation of caloric needs. Evaluation of protein, carbohydrates and lipids needs. Evaluation of vitamins and microelements needs. Types of nutrients used in enteral and parenteral nutrition. Complications of enteral and parenteral nutrition. Nutritional support specific to organ dysfunction.</p>	<ol style="list-style-type: none"> 1. Evaluation of nutritional status. 2. Installation of gastric and jejunal tube for enteral nutrition. 3. Gastric and jejunal feeding tube. 4. Calculation of the calories, protein, lipids, carbohydrates in a critically ill patient. 5. Parenteral nutrition. 6. Monitoring and evaluation of metabolism and nutrition. 7. Maintaining of the thermic balance.

6	<p>Ventilation regimens. Mechanical ventilation. Techniques, classification, terminology. Pathophysiology. Technical data. Intermittent positive pressure breathing. New forms of ventilation. Ventilation with electronic regulation(microprocessor). Parameters of mechanical ventilation. Airway pressure. Mechanical ventilation with PEEP. Optimal PEEP. PEEP optimized. PEEP minimum. Variable positive pressure ventilation. Continuous positive pressure ventilation (CPAP). Intermittent Mandatory Ventilation (IMV). Pressure support ventilation (PSV). Non-conventional techniques of mechanical ventilation. Adjusting and choosing of the ventilator. Functional changes in the mechanical ventilation. Indications by type of the mechanical ventilation.</p>	<ol style="list-style-type: none"> 1. Use of the mechanical ventilation equipment. 2. Indications, applications, techniques and criteria of physiological effects of PEEP, IMV, SIMV, PSV, BIPAP, CPAP, high frequency ventilation. 3. Techniques for mechanical ventilation withdrawal. 4. Bacteriological sampling of tracheal and bronchial secretion. 5. Hyperbaric oxygen therapy.
7	<p>Cardiopulmonary and cerebral resuscitation. Introduction. Phases of cardiopulmonary and cerebral reanimation. Emergency treatment of cardiac arrest. Airway obstruction treatment. Artificial ventilation. External cardiac massage. Advanced resuscitation. Pharmacotherapy. Electrical defibrillation. Recent technologies of resuscitation. Cardiac resuscitation with open chest. Intravenous infusion. Cardiac resuscitation algorithms.</p>	<ol style="list-style-type: none"> 1. ECG Monitoring 2. Cardiac and vasoactive drug administration in bolus and continuous infusion. 3. Electrical defibrillation and cardioversion. 4. Non-invasive cardiovascular monitoring.
8	<p>Treatment of postresuscitation syndrome. Algorithms of the resuscitations in a coma after cerebral ischemia - global anoxia. Special resuscitation situations. Evaluation of injuries in cardiac arrest. Termination of resuscitation. Exceeded coma. Biological death.</p>	<ol style="list-style-type: none"> 5. Evaluation of the state of coma and brain death.

	SUBJECTS	Activities
I. A	LOCAL AND LOCOREGIONAL ANESTHESIA. (Rusu)	
1	Local anesthesia: local anesthetic drugs, pharmacological and chemical characteristics, contact and infiltration anesthesia. Theory of the conductive anesthesia.	1. Tehniques and methods of local anesthesia
2	Physiological factors influencing the blocks Pharmacokinetics of the drugs depending on the method of use.	2. Intercostal block
3	Technical and clinical characterization of brachial plexus anesthesia, stellate ganglion block, lumbar plexus, sciatic block.	3. Block of the brachial plexus: - by Kulencampf - subaxillary acces 4. Block of the ischiadic and femoral nerves
4	Rahianesthezia. Tehniques, equipment, drugs, peculiarities.	5. Tehniques of the rahidian puncture
5	Epidural anesthesia . Tehniques, equipment, drugs, peculiarities.	6. Tehniques of the punction and cathetherisation of the epidural space
6	Caudal anesthesia. Tehniques, equipment, drugs, peculiarities.	7. Tehniques of the punction of the caudal space
I. B	ANESTHEZIA IN ORTOPEDY AND TRAUMATOLOGY.	
1	Evaluation of anesthesiological risks of the ortopedical and traumatological patient. Perioperative- perianesthetic preparation of the patients in traumatology.	1.Examination of the ortopedic and traumatological patients. 2.Evaluation of anesthesiological risks.
2	Peculiarities of anesthesia in surgery on the upper, lower members, large joints and other skeletal structures.	3.Loco-regional methods of anesthesia 4.Methods of general anesthesia
3	Serious acute injuries. Associated trauma. Traumatic shock, hemorrhagic shock. Anesthesia, intensive care, resuscitation and surgery complex. Indications and contraindications for advanced tactics.	5.Anesthesia, intensive care, resuscitation and surgery complex in serious acute and associated injuries.
4	Tactics for infusion - massive hemotransfusions, complications and their prevention.	6.Methods of infusion-transfusion in ICU
5	Contemporary methods of treatment of the associated trauma, anesthesia practice.	7.Intensive care of serious injuries

II	ANESTHESIA IN ABDOMINAL, ENDOCRINE SURGERY(Cornogolub)
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1.0	Anaesthesia in abdominal surgery. Perioperative preparation of the patient. Identification of anesthetic risk. Complications of anesthesia in abdominal interventions, prevention and their treatment.
1.1	Peculiarities of anesthesia in patients with acute abdomen. Types of acute abdomen. Common factor for acute abdomen (interests in anesthesia and intensive care).
1.2	Anesthesia in the acute abdomen: induction, venous access, full stomach problem, proper anesthesia (local, spinal, general).
1.3	Anaesthesia in patient with oesophageal malformation (Cardial achalazy, esophageal diffuse spasmus, gastroesophageal reflux GER). GER consequences: digestive and respiratory. Anaesthesia in patient with GER.
1.4	Anaesthesia in patient with peptic ulcer without or with complications (bleeding, pyloric stenosis, penetration, perforation). Risks and errors.
1.5	Peculiarities of anesthesia in surgery of the small intestine and colon. Malabsorption syndrome (global and selective). Assessment of anesthetic risk. Risks and errors.
1.6	Anesthesia in surgical treatment of pancreatitis (pancreas trauma, pancreatic stones, pancreatic cysts). Preoperative evaluation of anesthetic and surgical risks. Preoperative preparation algorithms. Methods and techniques of anesthesia. Risks and errors.
1.7	Peculiarities of anesthesia in patients with liver and hepatobiliary pathology. Preoperative risk assessment. Preoperative preparation. Risks and errors. Specific operative / anesthetic elements (upper digestive hemorrhage through rupture of esophageal varices).
2.0	Peculiarities of anesthesia in endocrine surgery. Evaluation of the patient with endocrine pathology. Principles of preoperative preparation. Methods and techniques of anesthesia. Risks and errors.
2.1	Anesthesia in surgery of the pituitary gland. Preoperative risk assessment. Principles of exploration and preparation. Methods and techniques of anesthesia. Early and late complications.
2.2	Principles of anesthesia for hypothyroidism, hyperthyroidism. Preoperative risk assessment. Peculiarities of preparation for surgery and anesthesia. Tactics and technique of anesthesia.
2.3	Peculiarities of anesthesia for parathyroiditis and adenoms. Preoperative exploration and evaluation principles. Methods and techniques of anesthesia. Risks and errors.
3.0	Anesthesia in kidney and urinary tract surgery. Evaluation of renal function during preanesthetic, anesthetic and postanesthetic periods. Methods and techniques of anesthesia. Risks and errors.
3.1	Principles of anesthesia in kidney, urinary tract and prostate adenoma surgery. Preanesthetic assessment. Methods and techniques of anesthesia. Complications caused by anesthesia. Evolutionary mechanisms of complications.
3.2	Peculiarities of anesthesia in adrenal surgery. Feocromocitoma. Assessment of anesthetic risk. Methods and techniques of anesthesia. Risks and errors.
3.3	Renal failure and anesthesia. Nephrogenic hypertension. Anesthetic complications.
4.0	Anaesthesia and analgesia in endoscopic surgery. Methods and techniques of anesthesia. Risks and errors.

III	INTENSIVE THERAPY OF PATIENTS WITH KIDNEY AND DIGESTIVE PATHOLOGY (Cornogolub)
1	Intensive therapy for patients with gastrointestinal disease. Acute abdomen. Types of acute abdomen. Stomach diseases. Diseases of the colon and small intestine . Pancreonecrosis, acute pancreatitis. Pathophysiology of severe metabolic disturbances. Tactics in diagnosis and intensive care patients in the surgical complex treatment. Acute liver failure .=. Pathophysiological mechanisms of the evolution of liver failure in mechanical jaundice, purulent colangitis, viral hepatitis, toxic liver cirrhosis, liver shock.
2	Hepato-renal syndrome. Functional disorders and systemic homeostasis. Clinical pathology and evolution. The peculiarities of intensive therapy and resuscitation of hepatorenal failure. Detoxication techniques. Peculiarities of infusion and transfusion in complex treatment. The peculiarities of parenteral nutrition in patients with entero-hepato-renal failure.
3	Hepatic coma. The clinical picture. Mechanisms of evolution. Tactics in diagnosis and intensive treatment and resuscitation differentiation. Clinical algorithm for diagnosis and treatment. Risks and errors in diagnosis and intensive therapy of hepato-renal failure. Hepato-renal syndrome in critical condition. Exploration methods and identifying the degree of disturbance of the hepato-renal system function. The test of functional differentiation of primary and secondary disorders.
4	Severe disorders of hemostasis. Laboratory diagnosis and clinical criteria of disturbance of hemostasis and treatment efficacy. Hidro-saline metabolism in hepato-renal failure, differential diagnosis and treatment. The peculiarities of hepato-renal failure, diagnosis and treatment of multiorganic failure.
4	Acid-base balance disorders in the case of hepato-renal failure and features corectiv treatment. Detoxification component in complex intensive therapy of hepato-renal failure. Detoxification methods and their complications. Efficacy. Component and complications of intravascular infusion. Nutrition for patients with hepato-renal failure and complications. Hepato-renal failure complications, their prevention and treatment.
5	Intensive therapy for patients with renal disease. Acute renal failure. Causes and mechanisms of pathophysiological evolution. Diagnosis, intensive therapy and resuscitation. Posttransfusional kidney and shock. The peculiarities of intensive therapy and resuscitation. Uremic coma. Detoxication methods and artificial kidney. Kidney transplantation and features in diagnosis and treatment.

I	ANESTHESIA IN THORACIC, CARDIAC AND VASCULAR SURGERY (Borş)
1	Anesthesia in thoracic surgery
1.1	Preoperative evaluation. Identification of respiratory function tests in thoracic surgery, anesthetic risk. Medications and patient preparation for surgery. Intranesthetic monitoring of the thoracic surgery patient. Peculiarities of anesthesia and operative risk factors of thoracic surgery. Selective bronchial intubation. Using of double-lumen tube. Techniques of anesthesia and single lung ventilation. Ventilation in the supine and lateral position.
1.2	Selecting the method of anesthesia for thoracotomy and its diversity. Intranesthetic management in lung surgery. Pleura, chest wall, mediastinum, trachea and esogag. Anesthesia problems for air-, hydro-, and hemotorax. Methods for correcting abnormal perfusion, diffusion and ventilation during anesthesia in thoracic surgery. Anesthesia for diagnostic procedures: bronchoscopy, esophagoscopy, mediastinal video-assisted thoracoscopy.
1.3	Perianesthetic respiratory incidents and accidents. Airway obstruction. Laryngo-, broncho- and bronhiolospasmus. Difficult intubation. Pulmonary embolism. Perianesthetic pulmonary edema, pneumothorax and hemothorax. Pneumomediastinum and hemomediastinum. Massive pulmonary haemorrhage in thoracic surgery, atelectasis and pulmonary infections. Aspiration of gastric contents.
1.4	Peculiarities of anesthesia in patients with pulmonary pathology. Preparation and conduction of anesthesia in severe chronic obstructive bronhopathy , asthma, tuberculosis, lung abscesses and cysts, lung cancer. Ventilatory disturbances. Hypoxia, hypoxemia, hypocapnia and hypercapnia in anesthesia and their effects. Acute respiratory failure during anesthesia and in postanesthetic period. Continuous mechanical ventilation. Regimens.
2	Anestezia în cardiac surgery.
2.1	Identification of the cardiovascular functional status. Noninvasive, invasive and laboratory cardiac investigations. Risk assessment in cardiac surgery anesthesia. Medications and patient preparation for cardiac surgery. Intra-anesthetic monitoring in cardiac surgery. Medications used in cardiac anesthesia. Technical equipment. Anaesthetic techniques and methods applied in cardiac surgery. Features and peculiarities. Advantages and disadvantages.
2.2	Anesthesia in open heart surgery. Extracorporeal circulation. Monitoring of oxygenation, ventilation, acid-base status and hemostasis. Circulation control and consequences of hypothermia in the CEC. Systemic effects and complications of the CEC. Myocardial protection. Ultrafiltration on the CEC. Means of mechanical cardiac support. Contrapulsy of the aortic balloon. Extra-corporeal membrane oxygenation. Total artificial heart.
2.3	Management of anesthesia in surgery of aorto-coronary bypass. Selection of anesthetic technique. Intranesthetic monitoring of myocardial ischemia. Management of anesthesia in surgery of acquired valvular heart defects. Anesthetic management of congenital heart defects surgery. Management of postoperative cardiac surgery of congenital and acquired heart defects. The peculiarities of anesthetics in cardiac surgery, vascular aneurysm. Anaesthesia and intensive therapy for cardiac injury. Postoperative management in cardiac surgery.

2.4	Anesthetical risks and error, prevention and treatment of cardiovascular complications. Functional cardiac disorders of the large and small circulation, the gas transport function and blood gas utilization. Myocardial infarction in anesthesia. Cardiac arrest and resuscitation in anesthesia. Vascular embolism. Peculiarities of anesthesia in patients with cardiac arrhythmias and severe heart failure. Peculiarities of anesthesia in case of the directed hypothermia and directed vasoplegy.
3	Anesthesia in vascular surgery
3.1	Peculiarities of anesthesia in surgery of the main blood vessels. Identification of anesthetic risk in the patient with vascular disease. Cardiac monitoring and vascular medical treatment of the cardiac treatment. Intranesthetic management in carotid surgery. Techniques and methods of anesthesia in carotid surgery. Advantages and disadvantages. Risks and complications. Intraoperative monitoring and maintenance of neurological integrity. Peculiarities of postoperative management.
3.2	Peculiarities of anesthesia in operations for the reconstruction of the thoracic aorta, abdominal aorta and its major branches. Management of pre- and intra- and postanesthetic of the patient with the intervention on the aorta and large vessels. Intranesthetic monitoring of the patient with surgical interventions on the aorta and large vessels. Fluid replacement therapy and blood loss. Postoperative management. Emergency anesthesia in vascular surgery.

II	INTENSIVE THERAPY OF PATIENTS WITH PULMONARY, CARDIAC PATHOLOGY, (Bors)
1	Intensive care of the patient with pulmonary pathology
1.1	Adult respiratory distress syndrome (shock lung - ARDS): lung sclerosis, pulmonary hypoperfusion syndrome, pulmonary embolism, thrombosis of pulmonary capillaries, pulmonary edema, pneumothorax, hydro- hemotorax, thoracic trauma and postsurgical states. Pathophysiological mechanisms of evolution of pulmonary failure. Clinical signs and diagnosis. Intensive therapy and reanimation.
1.2	Ventilatory prevalent diseases. Different types of pneumonia. Airway stenosis. Atelectazies. Bronchitis. Pulmonary tuberculosis. Asthma. Emphysema. Bronchoobstrutive chronic pneumonia. Pneumoconiosis. Pulmonary fibrosis. Pathophysiological mechanisms of evolution in the case of pulmonary pathology. Diagnosis, intensive therapy and reanimation.
1.3	Respiratory prosthesis (artificial ventilation) in the treatment of acute and chronic respiratory failure. Pathophysiology of prosthetic methods "external action" and extracorporeal oxygenation. Intermittent positive pressure ventilation with electronic regulation with PEEP. Special respiratory functions. Prolonged artificial ventilation. Choosing the VA system and optimization of indications and contraindications. Prosthetics respiratory complications.
1.4	Current theoretical and practical problems in intensive care and pulmonary respiratory failure. Risks and errors in diagnosis and treatment of lung and respiratory failure. Forms of pulmonary failure resistant to treatment. Pulmonary hypertension. Pulmonary vascular hypotension. The peculiarities of intensive therapy. Extracorporeal oxygenation. Oxygen and its complications.

2	Intensive care of the patient with cardiac pathology
2.1	Clinical evaluation and monitoring of critically ill cardiac patient in ICU and intensive care. Acute coronary syndromes. Unstable angina and myocardial infarction (AMI) without ST segment elevation. Q-wave MI. Mechanical complications of AMI. Thromboembolic complications of AMI. Pharmacological myocardial revascularization in AMI. Surgical revascularization in AMI. Arrhythmias and cardiac management of emergency conditions. Antiarrhythmic therapy and cardiac stimulation.
2.2	Hypertensive emergencies. Aortic dissection. Acute peripheral ischemia syndrome. Deep vein thrombosis of the pelvis and lower limbs. Pulmonary thromboembolism. Emergencies in cardiology. Emergency in patients with heart valve prosthesis. Cardiogenic shock. Sudden cardiac death. Cardiopulmonary and cerebral resuscitation and advanced life support. Electrocardioversion. Electrocardioimpulsation. Clinical algorithm for diagnosis and treatment of serious cardiovascular functional disorders.
2.3	Acute and chronic cardiovascular failure. Pathophysiologic mechanisms of the dysfunctions of cardiac contractility. The clinical picture and differential diagnosis. NICU and ICU complex. Pathophysiological mechanisms of disturbance of blood flow in large and small circuit and mixed forms of functional disorder. Intensive therapy and resuscitation.
2.4	Risks and errors in diagnosis and intensive therapy of acute and chronic heart failure. Insufficient cardiovascular resistance. Cardiovascular defects. Myocardial infarction complicated with heart failure and rhythm disorders and cardiovascular management. Severe cardiogenic shock. Resistant hypertension. Multifunctional complex treatment of cardiovascular failure. Cardiovascular complications and prevention of the failure.

III	ANESTHESIA IN OBSTETRICS AND GYNECOLOGY, INTENSIVE CARE OF A NEW-BORN CHILD(Cornogolub)
1.0	Peculiarities of the pregnant woman and fetus. Placental barrier. Pain in childbirth.
1.1	Peculiarities of drug penetration of the anesthetics through the fetoplacental barrier. Medications used at birth.
1.2	Anaesthesia in the birth per vias naturalis. Preanesthetical assessment. Medication. Inhalation analgesia, regional anesthesia, epidural, spinal and combined (spinal-epidural). Risks and errors.
1.3	Anaesthesia for caesarean section. Assessment of anesthetic risk. Methods and techniques of anesthesia. Anesthesia, epidural anesthesia, postoperative analgesia. Risks and errors.
1.4	Peculiarities of general anesthesia in caesarean section. Principles of exploration and evaluation of the pregnant woman. Methods and techniques. Postanesthetical early and late complications, principles of prevention.
1.5	Pregnancy-induced hypertension. Preeclampsia. Eclampsia and HELLP-syndrome. Anesthesia in pregnant woman and complicated birth. Assessment of anesthetic risk. Risks and errors.
1.6	Bleeding during childbirth. Principles of monitoring. Triggers: rupture of the uterus, placenta praevia, premature departure of placenta, uterine inertia, ectopic pregnancy. Algorithms of

	anesthesiology and intensive care.
1.7	Amniotic fluid embolism. Principles of assessment, exploration and monitoring. Pathophysiological mechanisms. Diagnostic and treatment algorithms. Risks and errors.
1.8	Principles of anesthesia in non-obstetric surgery. Assessment of anesthetic risk. Methods and techniques of anesthesia. Risks and errors.
1.9	Critical condition in newborns. Multiple organ dysfunction and systemic. Pulmonary distress syndrome in newborns. Intensive treatment algorithms.

IV	PEDIATRIC ANESTHESIOLOGY AND INTENSIVE CARE(Ștefăneț)
1	Pregnancy and child development: newborn, baby, preschooler, school, teenager. The anatomic and physiologic features of respiratory, cardiovascular systems.
2	The anatomic and physiologic function of the kidney, liver and digestive system. Hydro-electrolyte balance.
3	Neurological and psychomotor development. Thermic balance, temperature regulation. Thermic shock, malignant hyperthermia. Hematopoietic system.
4	Peculiarities of pharmacodynamics and pharmacokinetics of drugs in anesthesiology. Inhalation anesthetics (ether, halothane, isoflurane, sevoflurane). Non-inhalatory anesthetics (ketamine, opioids, benzodiazepines, propofol, barbiturates, etomidat). Muscle relaxants.
5	Anesthesia in pediatric surgery. Preoperative evaluation: anamnesis, general clinical examination, laboratory tests, psychological preparation of children and family.
6	Preanesthetic preparation. Premedication. Preparation of anesthesiologist working place: equipment, instruments, intravenous access, monitoring in children.
7	Peculiarities of induction and maintenance of anesthesia in pediatric surgery: inhalation anesthetics, intravenous. Loco-regional anesthesia in children.
8	Peculiarities of anesthesia in pediatric surgery in specific departments: congenital diseases, pathology, ENT, ophthalmology, traumatology, orthopedics and microsurgery, thoracic surgery, urology, etc..

9	Peculiarities of anesthesia in children in emergency surgery: airway foreign bodies and of digestive system, craniocerebral trauma, polutrauma, intestinal occlusion, peritonitis, bleeding, etc..
10	Sepsis in children. Septic shock. Classification. Peculiarities of intensive therapy.
11	Craniocerebral trauma, multiple trauma in children. Tactics and characteristics of intensive therapy.
12	Peculiarities of heart failure in children: congenital malformations, toxic and infectious miocarditis. Features of intensive therapy.
13	Peculiarities of respiratory failure in children: sthenotic laringotraheitis, obstructive bronchitis, destructive pneumonia. Peculiarities of intensive therapy.
14	Dehydration in children. Acid-base and electrolyte dysbalance. Acetonemic vomiting, reactive pancreatitis. Peculiarities of intensive therapy.

15	Anaphylactic reactions in children. Convulsions: diagnosis, intensive therapy. Exogenous poisoning. Peculiarities of intensive therapy.
16	Peculiarities of pharmacotherapy in pediatrics, pharmacodynamics, pharmacokinetics. Infusion therapy in children. Features and indications of blood transfusions and plasma substitutes.

I	ANESTHESIA FOR ENT SURGERY. (Guřan)
1.	Preanesthetic preparation: patient preparation in the operating room.
2.	Anesthesia: airway insurance, anesthesia techniques (contact anesthesia, infiltration anesthesia, conductive anesthesia, general anesthesia).
3.	Anesthesia in tonsillectomy, adenoidectomy. Intranasal interventions: nosebleeding, sinus surgery, maxillectomy. Pharyngeal abscesses. Anesthesia for ear surgery: local anesthesia, general anesthesia.
4.	Special anesthetic techniques: for myringotomy, for ear surgery for laryngeal microsurgery, for ENT laser surgery, anesthesia for endoscopic procedures: laryngoscopy, esophagoscopy, bronchoscopy, anesthesia in ENT mentally retarded patient, anesthesia for ENT cancer surgery (laryngectomy, pharyngo - larynx - esophagectomy), anesthesia in a patient with difficult intubation.
5.	Awakening from anesthesia: laryngospasm. Neck and throat injuries. Airway obstruction by foreign bodies.
	Anesthesia for maxillo-facial surgery.
1.	Specific problems. Tracheal intubation. Anesthesia in particular situations: trauma, infection, tumors. Arthroscopic surgery of the temporo-mandibular joint. Plastic and reconstructive surgery.
	Oral surgery and dental anesthesia.
1.	Patient assessment and choice of anesthesia.
2.	Local anesthesia and sedation. Oral Sedation. Inhalation sedation. Intravenous sedation.
3.	General anesthesia. Position of the patient. Inhaled induction. Intravenous induction. Postoperative analgesia.
	Ophthalmic Anaesthesia
1.	Anatomy of the orbit. IOP: intraocular pressure and intraocular volume, anesthesia and intraocular pressure, oculocardiac reflex. Ophthalmic pathology and surgical techniques: anterior segment, posterior segment; extraocular surgery, emergency surgery. Systemic effects of ophthalmic medications.
2.	Loco-regional anesthesia: preoperative evaluation and preparation, monitoring, local anesthetic and adjuvant substances, local anesthesia techniques, peribulbar anesthesia, retrobulbar anesthesia, complications of retrobulbar block. General anesthesia in penetrating wounds of the eyeball. General anesthesia with controlled hypotension.
3.	Anaesthesia for eye surgery in children, its specificity. Anesthesia in particular situations: congenital cataract surgery, glaucoma, strabismus, ocular trauma, emergency surgery, premature baby retinopathy.

4.	Ophthalmic complications attributed to surgery and / or anesthesia: corneal injury, acute glaucoma.
	Anesthesia in ambulatory surgery
1.	Advantages of ambulatory surgery. Ambulatory surgery unit. Selection of patients and the necessary investigations. Typical selection criteria and exclusion. Ambulatory pediatric surgeon. Selection. Preoperative fasting in pediatrics.
2.	The choice of anesthetic technique. Premedication. Induction and maintenance. TIVA. Postoperative nausea and vomiting. Treatment of postoperative pain. Local and regional anesthesia. Recovery. Postoperative morbidity.
	Anesthesia in mini invasive procedures for diagnosis.
1.	Evaluation of patients undergoing mini invasive procedures for diagnosis. Anesthetic risk.
2.	Anesthesia in radiological procedures: CT, NMR. Angiography: principles of anesthesiology, complications. Principles in anesthesiology in encefalography, bronchography, bronchoscopy. Endoscopic procedures: FEGDS, colonoscopy, duodenoscopy.

II	GERIATRIC ANESTHESIA.(Gurschi)
1	Anesthesia features in elderly people
1.1	Anatomical and functional changes in the elderly people (cardiovascular system, respiratory system, nervous system, kidneys, liver, body composition).
1.2	Pharmacodynamic and pharmacokinetic peculiarities of anesthetic drugs required for the elderly people(anesthetics, analgesics, muscle relaxants, local anesthetics, etc..) Anesthetic risks of the elderly people. Anesthetic techniques recommended in elderly people. Monitoring and postoperative care.
2	ANESTHESIA FEATURES IN ONCOLOGY
2.1	Anatomic and physiological changes of the oncological patient depending on the location of the disease process. Pathology specific cancer risks (bleeding, thromboembolia,infection, cardiac, respiratory, nutritional and metabolic risks).
2.2	Anaesthesia and cancer treatment. Chemotherapy side-effects, interactions with the anesthetic drug. Techniques of anesthesia in particular oncological problems (venous access, anesthesia for patient with aplasia, anesthesia for bone marrow sampling, etc.). Anesthetic risks for the oncological patient.

III	ANESTHESIA IN NEUROSURGERY. INTENSIVE CARE IN NEUROLOGICAL PATIENT. (Ștefăneț)
1.	Multiple trauma. Definitions. Frequency. Classification. Scores of the assessment of the injury severity.
2.	Diagnosis and treatment. Multiple trauma emergency measures. Transportation of the patients. Principles ventilation and oxygen therapy. Ensuring the hemodynamics stability. Stopping the bleeding.
3.	Traumatic shock. Physiological reactions that occur in traumatic shock. Principles of resuscitation and intensive care.
4.	Peculiarities of anesthesia in trauma patients. Preoperative preparation. The choice of method of anesthesia, establishing risks and their prevention. Full stomach problem. Preanestezia. Induction. Maintenance of anesthesia and postoperative transportation.
5.	Multiple trauma of the chest. Penetrating and non-penetrating chest injuries. Peculiarities of anesthesia and intensive care.
6.	Multiple trauma of cranio-facial region. Brain coma. Cerebral edema. Brain death. Peculiarities of anesthesia and intensive care.
7.	Multiple abdominal trauma. Multiple trauma with involvement of extremity bone, nerve, vessel. Peculiarities of anesthesia and intensive care.
8.	Metabolic disorders, in multiple trauma. Prevention of the complications of associated trauma patients. Causes of death.
9.	Peculiarities of anesthesia and intensive therapy in patients with neuromuscular diseases: myopathy, malignant hyperthermia, familial periodic paralysis, myasthenic syndromes.
10.	Peculiarities of anesthesia and intensive therapy in patients with: peripheral nervous system diseases, diseases of the spinal cord, brainstem, hypertension.
11.	Monitoring of patients undergoing brain surgery: EEG, evoked sensory and somatosensitive potentials, intracranial pressure monitoring.
12.	Peculiarities of anesthesia and intensive therapy in patients with stroke, thromboembolic ischemic injury, cerebral hypoxia, intracranial hemorrhage, craniocerebral trauma, Parkinson's disease, epilepsy.
13.	Cerebral edema. Etiology and mechanisms, pathophysiology, symptoms, Glasgow scale. Principles of intensive therapy of the cerebral edema.

14.	Peculiarities of anesthesia and postoperative intensive therapy in CNS tumors, intracranial aneurysms and arteriovenous malformations: preparation, premedication, induction, positioning the patient on the operating table, monitoring of the vital signs.
15.	Peculiarities of anesthesia and postoperative intensive therapy in cranio-cerebral trauma, cerebral stroke, epilepsy, surgery on the spine and spinal cord.
16.	Intensive therapy and resuscitation in patients with acute psychiatric disorders. Peculiarities of anesthesia and postoperative intensive therapy in patients with chronic neuro-psychiatric concomitant diseases: Parkinson's disease, Alzheimer's disease, epilepsy, schizophrenia, siringomiely, Guillan Barre syndrome (polyradiculoneuropathy), amyotrophic lateral sclerosis (Charcot's disease), multiple sclerosis.