Ministry of Health of Ukraine

O.O. Bogomolets National Medical University

GUIDELINES

to practical classes for students

Educational discipline: Basics of neonatology

Field of knowledge: 22 "Health care"

Specialty: 222 "Medicine", 228 "Pediatrics"

Department of Pediatrics No 2

Approved at the meeting of the department

from protocol № 1 dated 28.08.2023

Reviewed and approved by: Center for Pediatric Disciplines

from protocol № 1 dated 28.08.2023

Lesson topic : Neonatal problems related to the respiratory system.

Competencies :

- carry out an assessment of the general condition of a newborn child by making a reasoned decision according to existing algorithms and standard schemes, observing the relevant ethical and legal norms;

- distinguish and identify leading clinical symptoms and syndromes (asphyxia, apnea, respiratory distress);

- according to standard methods, using the previous data of the patient's history, data of the patient's examination, knowledge about the person, his organs and systems, establish a preliminary clinical diagnosis of the disease (respiratory distress syndrome, pneumonia, meconium aspiration syndrome, transient tachypnea, pulmonary hypertension, bronchopulmonary dysplasia);

- collect obstetric anamnesis, assess the physical development and state of organs and systems of the body, based on the results of laboratory and instrumental studies, evaluate information regarding the diagnosis (general analysis of blood, urine, blood proteins, blood glucose, bilirubin and its fractions, electrolytes, X-ray of the chest and abdominal cavity, neurosonography);

- establish a final clinical diagnosis by making a reasoned decision and analyzing the obtained objective data of clinical, additional examination, carrying out differential diagnosis, observing the relevant ethical and legal norms;

- assess and monitor the child's development, provide recommendations on feeding and nutritional features;

- to determine tactics and provide emergency medical care in emergency situations (respiratory distress, apnea) in accordance with existing clinical protocols and treatment standards;

- perform medical manipulations (perform indirect heart massage, artificial respiration, install nasogastric and orogastric tubes, restore airway patency).

Goal:

Formation of professional competences; achievement of program learning outcomes in the process of discussing the topic and performing independent work on the topic; mastering practical skills and methods of providing emergency care.

Equipment: newborn baby manikin, ventilator and oxygen therapy kit, resuscitation bag and face mask size "1", equipment for airway sanitation (rubber pears), umbilical vein catheterization kit (scalpel, ligature, tweezers, umbilical catheter, syringe for injections), neonatal stethoscope, pulse oximeter, diapers, disposable gloves, antiseptic for hand treatment.

Lesson plan and organizational structure

The name of the stage	Description of the stage	Levels of assimilation	Time
Preparatory	*Organizational issues* *Learning motivation:* The establishment of external breathing in newborn children is one of the most important components of early neonatal adaptation, which is why numerous diseases in the early neonatal period are accompanied by respiratory distress. Effective emergency care for children with signs of respiratory distress plays an important role in reducing neonatal mortality rates. *Control of the initial level of knowledge* (*test control and oral survey*): 1. The cause of transient tachypnea of newborns: A. Deficiency of surfactant B. Perinatal asphyxia or hypoxia B. Infection **D. Delayed resorption of fetal lung fluid** D. Increased resistance of pulmonary arteries 2. X-ray signs of bronchopulmonary dysplasia A. Infiltration with different areas of atelectasis and flattening of the diaphragm **B. Multicystic changes with the presence of areas of emphysema, lung scars and atelectasis** B. Distended lungs with striate perihilar markings, giving the appearance of a hairy heart border, whereas the lung periphery is clear. D. Frosted glass with visible air bronchograms D. Depletion of the vascular component of the pulmonary pattern 3. Which children are more likely to develop meconium aspiration syndrome? **A. Transferred newborns with perinatal hypoxia** B. Premature babies with a gestational age of <34 weeks B. Newborns born at a gestation period of 35-37 weeks D. Full-term children born by elective caesarean section	Introductory Reproductive	25 min

	D. Transplanted children born by elective caesarean section 4. Initial method of respiratory support for apnea of prematurity A. Oxygen therapy **B. CPAP** B. Intubation and mechanical ventilation D. High-frequency oscillatory ventilation D. Extracorporeal membrane oxygenation 5. In what case is it advisable to use high-frequency oscillatory ventilation? A. Meconium aspiration syndrome B. Bronchopulmonary dysplasia B. Transient tachypnea G. Pulmonary hypertension **D. Air leakage syndrome**		
Basic	*Performance of practical tasks* : - demonstration of a thematic patient in the neonatal intensive care unit; - study of obstetric anamnesis; - evaluation of the results of laboratory and instrumental examination methods; - on the basis of obstetric anamnesis, examination data and results of laboratory and instrumental studies , establishment of a preliminary clinical diagnosis; - determination of factors and pathogenetic mechanisms of disease development; - appointment of treatment (emergency measures, medical treatment, particularities of care, feeding); - determination of disease prevention measures; - familiarization with the operation of the equipment - incubators, resuscitation table, phototherapy lamp, radiant heat lamp, ventilators; - practicing medical manipulations using a dummy of a newborn child.	Introductory Reconstructive Creative Reproductive Creative	1 hour 45 minutes

Final	*Control of the final level of training* (*situational problems*) *Overall evaluation of the student's educational activity:* 1. A boy from the first pregnancy, during which there was mild anemia, asymptomatic bacteriuria, the first birth at 35 weeks of gestation, complicated by premature rupture of the fetal membranes, was born with a body weight of 1800 g, a height of 42 cm. Apgar score 7-7 points At the end of the second day of life, the child had apnea attacks lasting 20 seconds, accompanied by cyanosis. During the examination: breathing in the lungs is somewhat weakened, there are no wheezes, heart sounds are rhythmic, no noise is heard, heart rate is 110 per minute. Previous diagnosis? Examination? Treatment? Answer standard: 1) Apnea of premature babies. 2) X-ray of chest organs, general blood test, blood glucose. 3) CPAP, methylxanthines. 2. A girl from the first pregnancy, the first delivery at 42 weeks of gestation, was born with a body weight of 3950 g, a height of 53 cm. Two times tight entanglement of the umbilical cord around the neck. Amniotic fluid is meconium. At birth, there is no cry and spontaneous motor activity. Previous diagnosis? Emergency aid? Answer standard: 1) Asphyxia at birth. Meconium aspiration syndrome. 2) Avoiding tactile stimulation, after separation from the mother, transfer to the resuscitation table, provide the correct position, perform rehabilitation of the lower pharynx (above the vocal cords) under the control of a laryngoscope, intubate, suction the contents of the trachea. If the heart rate is <60 per minute, perform indirect heart massage and mechanical ventilation using an Ambu bag in a ratio of 3:1.	Creative	30 min

Recommended reading :

Basic:

1. Neonatology: a national textbook: in 2 volumes / edited by by Professor E. Ye. Shunko - K., 2015. - Volume 1. - pp. 289-404.

2. Neonatology: textbook: in 3 volumes / T.K. Znamenska, Y.G. Antipkin, M.L. Aryaev, etc.; under the editorship T.K. Znamenskaya. – Lviv: T.V. Marchenko Publisher, 2020. – Volume 2. - pp. 40-141.

3. Unified clinical protocol of secondary (specialized) and tertiary (highly specialized) medical care "Respiratory distress syndrome in premature babies", approved by the Order of the Ministry of Health of Ukraine dated 05.05.2021 No. 873 https://zakon.rada.gov.ua /rada/show/v0873282-21#Text

4. Unified clinical protocol "Initial, resuscitation and post-resuscitation care for newborns in Ukraine", approved by the Order of the Ministry of Health of Ukraine dated March 28, 2014 No. 225 http://document.ua/pro-zatverdzhennja-ta-vprovadzhennja-mediko-tehnologichnih-d-doc190536.html

Additional:

1. Basics of pediatrics according to Nelson: in 2 volumes. Volume 1 / Karen J. Marcdante, Robert M. Kligman; translation of the 8th Eng. edition. Scientific editors of the translation V.S. Berezenko, T.V. Rest Kyiv: VSV "Medicine", 2019. T1. – 378 pp., pp. 248-254.

2. Academic lectures on pediatrics / under the editorship of Yu.G. Antipkin. - Kyiv: RA-HARMONIA LLC, 2020 - p.349-363, p.330-363.

3. Nelson Textbook of Pediatrics, Volume 1 of 5 volumes, 21th Edition, 2019 by Robert M. Kliegman, Nathan J. Blum, Samir S. Shah, Joseph W. ST GEME III, Robert C. Tasker, Karen M. Wilson, Richard E. Behrman, pp. 929-948.

Information resources:

https://www.msdmanuals.com/uk/professional/pediatrics/respiratory-problems-in-neonates/respiratory-support-in-neonates-and-infants

Questions for student self-preparation for practical training:

1. Signs of respiratory distress in newborns (RD).

2. Causes of RD in newborns.

3. Assessment of the degree of severity of RD.

4. Emergency care for RD.

5. Apnea.

6. Respiratory distress syndrome.

7. Transient tachypnea of newborns.

8. Pulmonary hypertension.

9. Bronchopulmonary dysplasia.

10. Meconium aspiration syndrome.

Methodical development is completed

Associate Professor of the Department of Pediatrics No. 2 Loginova I.O.