Methodological guidelines for teachers on teaching clinical skills in The center of practical skills (using action algorithms)

Specialty: «General medicine» 6B10101
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1. **Name of clinical skill:** Convulsive syndrome.
2. **The purpose of learning:**
- correlation of symptoms and examination data with a care of a child with convulsive syndrome;
- determining a sequence of interventions in assisting a child with convulsive syndrome.

3. Theoretical knowledge necessary for mastering skills:

Convulsions are sudden attacks of clonic or clonic-tonic involuntary muscle contractions with or without loss of consciousness.

Classification:
- benign convulsions;
- epileptic;
- convulsions in infectious diseases;
- convulsions due to metabolic disorders (hypoglycemia, hyponatremia);
- convulsions caused by noncommunicable diseases (trauma, poisoning, diabetic ketoacidosis, glomerulonephritic encephalopathy).

Risk factors:
- burdened obstetric history (complicated birth, birth injury);
- hypoglycemia;
- severe fever;
- epilepsy in a personal and family anamnesis;
- infectious diseases of the Central nervous system (meningitis, encephalitis);
- head injury;
- poisoning with drugs or toxic drugs;
- post-vaccination complications;
- low levels of calcium, pyridoxine in the blood.

Diagnostic criterions:
- involuntary muscle contraction;
- tense or bulging fontanel;
- unnatural posture;
- signs of a head injury or other injury.

The list of the main diagnostic measures:
1. General blood test (3 parameters);
2. General urine test.

Tactics of treatment:
It is necessary to correctly position a child:
- If there is no suspicion of a neck injury:
- turn the child on his side to reduce the risk of aspiration;
- keep the child’s head slightly turned and stabilize it by putting the cheek on the hand;
- bend one leg of the child to stabilize the position of the body.
- If there is suspicion of a neck injury:
- stabilize the child’s neck and leave him lying on his back;
- fix the child's forehead to a hard surface to secure the position;
- place bags of warm liquid on both sides of the baby's head to prevent head turns.
- when vomiting, turn the baby on its side, keeping the head in line with the torso.

In the presence of fever (38,5 and more) - paracetamol * 10-15 mg / kg and / or wipe the child with water at room temperature, do not prescribe oral drugs before relief of seizures due to the danger of aspiration.

Anticonvulsant treatment:

- diazepam * 0.5 mg / kg rectally or intramuscularly in infants < 2 months or intravenously diazepam 0.2-0.3 mg / kg If there is no effect – after 10 min. after administration – repeat. The maximum dose is 10 mg (with a body weight of 20 kg).
For children < 2 months. - phenobarbital solution 20 mg / kg. Repeat after 30 min., if the cramps continue. Urgently to send to hospital.
List of essential medicines:
1. *paracetamol 500 mg, tablets;
2. *diazepam 5 mg, tablets; 10 mg/2ml, ampoules.
List of additional medicines:
1. phenobarbital 20 mg/5 ml, ampoules.
Indications for hospitalization:
A presence of seizures is an absolute indication for hospitalization.
Indicators of treatment effectiveness: relief of convulsive syndrome.

4. Essential clinical skills:
- counting tespiratory, heart rate;
- auscultation of lungs, heart.

5. List of simulators, mannequins, models: BabySim.

6. List of equipment and medical devices:
1. Materials for intravenous injection;
2. Transparent patch;
3. Distilled water 500 ml, bottle labeled as «0.9% isotonic solution», Tubes for intravenous injection;
4. Distilled water 2 ml, bottle labeled as Phenytoin 50 mg/ml;
5. Oxygen, materials for ALV;
6. Nasal cannula;
7. Oxygen supply device SpO2 sample.

7. Clinical case:

A child is brought to a hospital in an ambulance. The child's mother came home from work on the call of a nanny. The nanny told her that the child vomited 3 times and he was very sleepy. The child's mother called an ambulance when the child lost consciousness in arms of the nurse and stopped breathing. The child a few days before kept a slight temperature, and had a runny nose. According to an ambulance crew report, the child had apnea when they arrived, the mother trying mouth-to-mouth CPR. By this time the child did not react to anything, he had cyanosis and bradycardia. Artificial ventilation and oxygen supply were started. The ambulance could not establish intravenous access and they took the child to the hospital.

The child begins to convulse.

Admission to the emergency room the baby has the following vital signs: heart rate is about 180, pressure 50/40, respiratory rate-40, SpO2 is not determined and temperature 38C. Fine bubbling rales are heard, hypoactive sounds of peristalsis. Heart rate - sinus tachycardia. A small bruise with a diameter of 2 cm. Abundant purulent discharge from a nose. A skin is covered with spots, a filling speed of capillaries is 5 seconds. A frontal fontanel is swollen, pupils react to stimulus. Although all extremities move, the child is in a lethargic state.
Test results:
Complete blood count: hemoglobin 9.1, hematocrit 28.2%, white blood cells 14, platelets 124,000.
Biochemical blood test: Na 138, K 3.6, Cl 105, BUN 18, creatinine 0.5, glucose 74.
Respiratory syncytial virus test: negative.
Chest X-ray: clean.

8. Tasks:

In this scenario, 3 stages, a transition from one stage to another is carried out manually at a discretion of a mentor. In the first stage, a student examines a child in an emergency room and begins treatment. The child begins to convulse. In the final stage, students must examine the child for abuse and transfer the child to the children's intensive care department. When students conduct correct and timely interventions, the mentor should move on to the next stage.

In Stage 1 Admission to the emergency room, the baby has the following vital signs: heart rate is about 180, pressure is 50/40, respiratory rate is 40, SpO2 is not determined and temperature is 38C. Fine bubbling rales are heard, hypoactive sounds of peristalsis. Heart rate - sinus tachycardia. Eyes are closed, a small bruise with a diameter of 2 cm is above the right eye. Abundant purulent discharge from the nose. A skin is covered with spots, a filling speed of capillaries is 5 seconds. A frontal fontanel is swollen, pupils react to a stimulus. Although all extremities move, the child is in a lethargic state. It is expected that a cadet will conduct a complete initial examination of the child, analyze the data, install a heart monitor and request an interpretation of the data. Also, the cadet must determine the correct dose and start infusion therapy (20 ml / kg = 72 ml), constantly monitor the infusion pump and the condition of the child, monitor the fluid flow rate and request the necessary laboratory tests. The cadet must also correctly and effectively communicate with the patient and relatives, satisfying their psychosocial needs and supporting them. The cadet must request the results of laboratory tests and X-ray images, analyze the data. Mentor must report test results.

In Stage 2 Convulsions 30 minutes later, the child’s condition worsens, the baby’s heart rate is about 200, the pressure is 80-90/50, the respiratory rate is 10-15, SpO2 80 with oxygen 2 l/m, the baby is observed for 1 minute tonic-clonic convulsions. Near-mouth cyanosis, pupils displaced to the left. It is expected that the cadet will ensure the safety of the child and the environment, control seizures and fill out the necessary documents, increase the oxygen supply to increase saturation, immediately inform the attending physician of an attack of seizures and receive new instructions. The cadet must re-examine, analyze the results and fill out the documents.

In Stage 3 Examination for abuse, the child's condition improves, heart rate 100, blood pressure 70/40, respiratory rate 30, SpO2 90 on oxygen 4 l/m. The heart rhythm is normal sinus, bilateral fine-bubbly moist rales are heard in lungs, and the child is in a lethargic state. It is expected that the cadet will correctly calculate the dose and inject intravenously phenytoin, according to 6 rules (15 mg x 3.6 kg = 54 mg = 1.08 ml for 5-15 minutes), establish monitoring of blood pressure, heart rate and pulse during the infusion of phenytoin, give parents to sign an agreement to conduct a lumbar puncture, assist in carrying out a lumbar puncture, raise the headboard by 30 degrees, make sure that the head position is neutral, limit the stimulation of the child to a minimum (silence, dimmed light).

9.Algorithm of execution skills:

№	Algorithm of execution skills	Execution		
		Yes	No	Note
1	Admission to the emergency room. Carries out a full examination of a child, analyzes a received data, takes necessary measures and fills out documents.			
2	Installs a heart monitor and requests interpretation.			
3	Calculates a dose and begins infusion therapy (20 ml / kg = 72 ml). Constantly monitors a infusion pump and condition of the child, and controls a rate of fluid flow. Requests necessary laboratory tests.			

4	Controlling convulsions.			
5	Increases a flow of oxygen to increase a saturation.			
6	Immediately reports to the attending physician about an attack of convulsions.			
7	Reconducts the examination, analyzes results.			
8	Correctly calculates a dose and injects phenytoin intravenously, according to 6 rules (15 mg x 3.6 kg = 54 mg = 1.08 ml for 5-15 minutes), during the infusion controls heart rate, blood pressure and heart rate.			
9	Prepares the patient for transportation to children's intensive care department and transmits a report to a receiving nurse.			

10. Materials for evaluation on a topic:

1. What conclusions can be drawn from a child's medical history, which indicates that he had colic?
2. Why should we start an infusion therapy?
3. What does breathing noise indicate?
4. What does the convex frontal fontanel indicate?
5. What diseases can a convex fontanel indicate?
6. Why is it important to morally support patient's relatives?
7. Is it necessary to isolate a child?
8. What important information can be found by analyzing an x-ray of the chest?
9. What is RSV? Why do we need a test for RSV antigens?
10. Analyze results of laboratory tests.
11. What should you do to reassure parents/relatives?
12. What should you do during convulsions in a child?
13. How should you behave towards parents who are next to the child?
14. What diseases is needed to be diagnosed for this child?
15. Why administer phenytoin to the patient?
16. What solutions are incompatible with phenytoin?
17. How is phenytoin administered?
18. What side effects are observed if phenytoin is administered too quickly?
19. What are the side effects of phenytoin?
20. Why was 0.2% saline replaced with 0.9%?

11. Evaluation criterions:

№	Execution	Evaluation criterions
1	Done	All steps are taken into account when performed correctly.
2	Half done	It is counted for small errors in the course of execution in 3 steps.
3	Not done	Makes mistakes during execution by more than 3 steps.

12. Literature:

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13. Standard of correct answers on materials for evaluation:

1. Children with colic are very capricious and difficult to calm. Very often, people who look after a child with colic have stress.
2. There is a suspicion that a child has a shock, fluid resuscitation is necessary to increase cardiac output.
3. There is fluid in lungs.
4. Cerebral edema (increased intracranial pressure). A sign that a child does not have dehydration.
5. Meningitis, closed skull injury, tumor (volumetric formation), hydrocephalus.
6. They may feel guilty for leaving a child with an outsider.
7. Yes, but only until results of blood culture are obtained and other diseases are not detected.
8. Lungs are clean (no pneumonia).
9. Viral infection, children often get sick in the winter. The child has a runny nose, he is naughty, there are signs of sepsis.
10. Analyze results of laboratory tests. Low hemoglobin and hematocrit: a sign of anemia or hemorrhage. Other test results are normal.
11. Help contact relevant services. Contact social services. Contact the shepherd if necessary. Talk with parents, answer all their questions. Keep them up to date all the time. Allow parents to be close to a child and take part in caring for him.
12. Protect from damage. Monitor airway Record seizure type and duration.
13. Encourage them. Allow them to stay in the ward if they want to.
14. Meningitis. Pneumonia or RSV. Sepsis. Closed skull injury. Apnea of unknown origin.
15. To control seizures.
16. Dextrose solution.

17. For infants, the current rate of intravenous infusion should not exceed 1-3 mg/kg/min. Calculate a dose and flow rate of phenytoin infusion. 4 mg x 3.6 kg = 14.4 mg/day. 14.4 mg / 2 = 7.2 mg/dose. 7.2 mg at 50 mg/ml = 0.14 ml. Enter within 2-4 minutes.
18. Hypotension. Bradycardia. Arrhythmia. Cardiovascular insufficiency.
19. Hypertrophic gingivitis. Drowsiness. Stefan Johnson syndrome.
20. Now that the diagnosis is known, it is only necessary to administer an isotonic solution to prevent cerebral edema. Hypertonic dextrose solution of 5/0.9% isotonic solution when it enters a body becomes isotonic.