APPROVED
The First Pro-Rector for Scientific and Pedagogical Affairs
Danylo Halytsky Lviv National Medical University

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Assoc. Prof. Iryna SOLONYNKO

APPROVED
by the joint meeting of the Academic Councils of the Medical Faculties No. 1 and No. 2 and the Faculty of Foreign Students of Danylo Halytskyi Lviv National Medical University, Protocol No. 1/03-2024 of 13.03.2024.
Dean of Medical Faculty No 1 _____ Prof. Marta KOLISHETSKA
Dean of Medical Faculty No 2 _____ Assoc. Prof. Oleh KAPUSTYNSKYI
Dean of Foreign Students_____ Assoc. Prof. Eugene VARYVODA

APPROVED
At the meeting of the specialized methodical committee on pediatric disciplines Protocol No._2_ of "15" February 2024

The Chairman of the specialized
methodical commission _____ Prof. Lesya BESH

ALGORITHMS
of the examination station OSP(C)E
Neonatal Resuscitation
Specialty 222 «Medicine»
discipline"Pediatric diseases with pediatric infectious diseases"

Performance Algorithm No. 1

	STUDENT	EXAMINER
1. To introduce yourself		
"Receives" a baby in blanket from a midwife		
2. INITIAL STEPS OF CARE		
1	To provide the correct position on the resuscitation table, suction mouth and nose, if necessary (*asks examiner if the baby has any respiratory disorders or a significant amount of oral content*)[1], dry with towel or blanket, remove wet linen, stimulate by rubbing back or extremities, provide the correct position of the head	**«The baby does not breath»**
3. ASSESSMENT OF THE NEED FOR RESUSCITATION		
2	**To check breathing**: *asks examiner if the infant breaths or has gasping respirations*	**«The baby does not breath»**
4-5. PROVIDING EFFECTIVE POSITIVE-PRESSURE VENTILATION (PPV)		
3	To begin PPV not later than in 1 min after receiving the baby	PO probe is attached **«15 seconds passed»** **«HR is bradycardic and not increasing»**
4	To call for help	
5	To ask assistant to attach a pulsoximeter (PO) probe to the right infant's wrist and connect to monitor	
6	Within 15 seconds of beginning PPV, <u>without its interruption</u>, to request check to assess if HR is rising	
7	To evaluate chest movements (*asks examiner*)	Examiner confirms the presence or absence of chest movements in the infant
7.1	If chest movements observed, to continue PPV x 15 sec	
7.2	If NO chest movement observed, to proceed through corrective steps until chest movement: 1) mask adjustment, 2) reposition of the head, 3) to suction mouth and nose, 4) to open mouth, 5) to increase pressure, 6) to indicate the need for alternative airway – endotracheal tube or laryngeal mask To notice and announce the time of appearance of chest movements	
8	To administer effective PPV (with chest movements) x 30 seconds	**«30 seconds passed»**
6. DETERMINING THE NEED FOR CHEST COMPRESSIONS		
9	To stop PPV, remove the mask from infant's face, and check HR with a stethoscope To indicate the need for chest compressions and endotracheal intubation To indicate the need to assess the first Apgar score	**«HR is about 40 bpm»**
7. CHEST COMPRESSIONS		
10	To ask assistant to increase oxygen concentration to 100% (*to attach an oxygen tube and oxygen reservoir*) and ventilate the baby's lungs	Examiner confirms ventilation of baby's lungs
11	To start chest compressions (<u>thumbs technique</u>) with coordinated ventilation, counting "*one-and-two-and-three-and-bag-and*" (rate – 90 per minute; thumbs positioned just below the line between the nipples; compressions one-third of the AP diameter of the chest;	

[1] - information about infant's condition will be provided by examiner.

	STUDENT	EXAMINER
	thumbs stay in touch with the surface; 3 compressions to 1 ventilation every 2 s)	**«60 seconds passed»**
8. DETERMINING THE NEED FOR MEDICATIONS		
12	To ask if the pulse oximeter detects heart rate and saturation To discontinue chest compressions and ask the assistant to stop ventilation and remove the mask from the face of the infant To check heart rate with auscultation of the heart beats for 6 s (to multiply the result by 10)	**"Pulsoximeter is not detecting a signal"** **"HR is about 30 bpm"**
9. ADMINISTRATION OF MEDICATIONS		
13	To indicate the need to insert a catheter into umbilical vein and promptly infuse intravenously 0.1-0.3 ml/kg of epinephrine (0.01% solution) (*another assistant is needed*)	**Confirms performance**
14	To continue chest compressions using <u>two fingers technique</u> for 60 s (provides the ability to simultaneously insert the catheter in the umbilical vein and administer medication)	**«60 seconds passed»**
15	To ask the examiner if the pulse oximeter provides readings for heart rate and hemoglobin oxygen saturation (SpO_2)	**«HR 100 bpm. SpO_2 75%»**
10. FINAL STEPS		
16	To discontinue chest compressions and evaluate spontaneous breathing (*asks examiner*)	**«No spontaneous respirations»**
17	To continue PPV with higher ventilation rate (40-60 breaths/min), reducing the oxygen concentration (*to disconnect the oxygen reservoir*) To confirm the presence of chest movements	 **«30 seconds passed»**
18	To assess HR, spontaneous breathing, and SpO_2 (*asks examiner*)	**«HR 120 bpm, spontaneously breathing. SpO_2 – 85%»**
19	To gradually discontinue PPV (*after several ventilations with lower frequency and pressure, remove the mask from the infant's face*). To assess HR, spontaneous respirations and SpO_2 after the final cessation of ventilation (*asks examiner*)	 **«HR 140 bpm, spontaneously breathing, SpO_2 – 90%»**
20	Specify the need: - for follow-up of the infant's condition (pulsoximetry plus clinical monitoring) - to assess the Apgar score @ 5 minute - to inform the parents about the results of resuscitation - to transfer the infant to the neonatal intensive care unit (ward)	

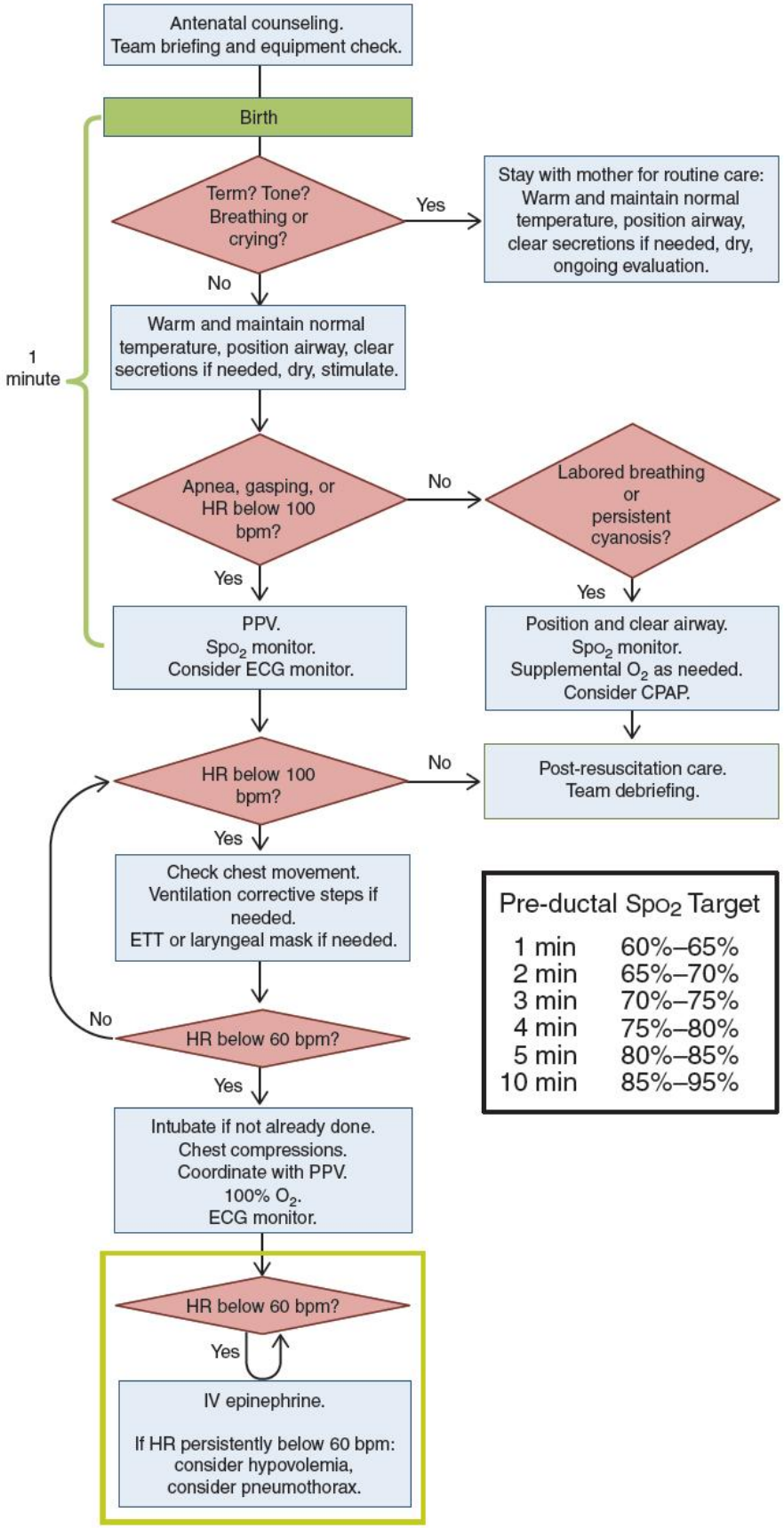
Performance Algorithm No. 2

	STUDENT	EXAMINER
1. To introduce yourself		
"Receives" a baby in blanket from a midwife		
2. INITIAL STEPS OF CARE		
1	To provide the correct position on the resuscitation table, suction mouth and nose, if necessary (*asks examiner if the baby has any respiratory disorders or a significant amount of oral content*)[2], dry with towel or blanket, remove wet linen, stimulate by rubbing back or extremities, provide the correct position of the head	**«The baby does not breath»**
3. ASSESSMENT OF THE NEED FOR RESUSCITATION		
2	**To check breathing**: *asks examiner if the infant breaths or has gasping respirations*	**«The baby is breathing, no gasping»**
3	**To check the heart rate** with a stethoscope, counting the number of heart beats for 6 seconds and multiply by 10	**«HR is 90 bpm»**
4-5. PROVIDING EFFECTIVE POSITIVE-PRESSURE VENTILATION (PPV)		
4	To begin PPV not later than in 1 min after receiving the baby	
5	To call for help	
6	To ask assistant to attach a pulsoximeter (PO) probe to the right infant's wrist and connect to the monitor	PO probe is attached
7	Within 15 seconds of beginning PPV, <u>without its interruption</u>, to request check to assess if HR is rising	**«15 seconds passed»** **«HR is bradycardic but increasing»**
8	Continue PPV for another 15 seconds, providing a total of effective ventilation for 30 seconds	**«30 seconds passed»**
6. DETERMINING THE NEED FOR CHEST COMPRESSIONS		
9	To stop PPV, remove the mask from infant's face, and check HR with a stethoscope To indicate the need for chest compressions and endotracheal intubation To indicate the need to assess the first Apgar score	**«HR is about 50 bpm»**
7. CHEST COMPRESSIONS		
10	To ask assistant to increase oxygen concentration to 100% (to attach an oxygen tube and oxygen reservoir) and ventilate the baby's lungs	Examiner confirms ventilation of baby's lungs
11	To start chest compressions (<u>thumbs technique</u>) with coordinated ventilation counting "*one-and-two-and-three-and-bag-and*" (rate – 90 per minute; thumbs positioned just below the line between the nipples; compressions one-third of the AP diameter of the chest; thumbs stay in touch with the surface; 3 compressions to 1 ventilation every 2 s)	**«60 seconds passed»**
8. DETERMINING THE NEED FOR MEDICATIONS		
12	To ask if the pulse oximeter detects heart rate and saturation To discontinue chest compressions and ask the assistant to stop ventilation and remove the mask from the face of the infant	**"Pulsoximeter is not detecting a signal"**

[2] - information about infant's condition will be provided by examiner.

	STUDENT	EXAMINER
	To check heart rate with auscultation of the heart beats for 6 s (to multiply the result by 10)	**"HR is about 30 bpm"**
9. ADMINISTRATION OF MEDICATIONS		
13	To indicate the need to insert a catheter into umbilical vein and promptly infuse intravenously 0.1-0.3 ml/kg of epinephrine (0.01% solution) (*another assistant is needed*)	**Confirms performance**
14	To continue chest compressions using two fingers technique for 60 s (provides the ability to simultaneously catheterize the umbilical vein and administer medication)	**«60 seconds passed»**
15	To ask the examiner if the pulse oximeter provides readings for heart rate and hemoglobin oxygen saturation (SpO_2)	**«HR 100 bpm. SpO_2 75%»**
10. FINAL STEPS		
16	To discontinue chest compressions and evaluate spontaneous breathing (*asks examiner*)	**«No spontaneous respirations»**
17	To continue PPV with higher ventilation rate (40-60 breaths/min), reducing the oxygen concentration (*to disconnect the oxygen reservoir*) To confirm the presence of chest movements	**«30 seconds passed»**
18	To assess HR, spontaneous breathing, and SpO_2 (*asks examiner*)	**«HR 120 bpm, spontaneously breathing. SpO_2 – 85%»**
19	To gradually discontinue PPV (*after several ventilations with lower frequency and pressure, remove the mask from the infant's face*). To assess HR, spontaneous respirations and SpO_2 after the final cessation of ventilation (*asks examiner*)	**«HR 140 bpm, spontaneously breathing, SpO_2 – 90%»**
20	Specify the need: - for follow-up of the infant's condition (pulsoximetry plus clinical monitoring) - to assess the Apgar score @ 5 minute - to inform the parents about the results of resuscitation - to transfer the infant to the neonatal intensive care unit (ward)	

Neonatal Resuscitation Algorithm



Performance Algorithm No. 1

	STUDENT	EXAMINER
4. To introduce yourself		
Receives a task from the examiner, the infant is on the floor, moveless		
	5. Ensure safety of rescuer and infant	
1	Assess threats with personal safety (look around, ask examiner – is it safe or no, wear gloves)	**It is safe**
	6. CONSCIOUSNESS ASSESSMENT	
1	Check for responsiveness to verbal stimulation (call him and watch his reaction)	**Infant does not respond**
2	If he does not respond, stabilize his head, and gently shake his shoulder with the other hand, at the same time loudly say the baby's name or say "Baby, wake up"	**Infant does not respond**
3	Ask to help, ask examiner to call the EMS immediately with the correct information transfer (who, where, what happened (ambulance will arrive in 4-5 minutes)) and give the Ambu bag and bring the AED	**Calls an ambulance according to the instructions given by the rescuer**
	7. ENSURE AIRWAY PATANCY	
1	Ensure a neutral position of the head	
2	Quickly examine the oral cavity, make sure that there is no foreign body (ask the examiner about it).	**There is nothing in oral cavity**
	8. BREATHING ASSESSMENT	
1	Breathing assessment according to the algorithm “hear, see, feel” (up to 10 s)	**Infant doesn’t breath**
9. LUNG VENTILATION		
1	Check the tightness of Ambu bag. Provide 5 rescue breaths (place the face mask on the infant's face and fix it according to the "Ok" principle; tilt the head and pull the lower jaw, sealing the mask to the face with the left hand; press the Ambu bag with the right hand until the infant's chest rises; duration of artificial respiration - 1 s)	The examiner confirms the presence or absence of chest movements
2	Reassessment of vital signs	
10. CHEST COMPRESSIONS		
1	Start chest compressions (use a two-thumb encircling technique for chest compression in infants; be careful to avoid incomplete recoil; start rhythmic compression with frequency of 100-120 per minute – depth should be 1/3 of the chest anterior-posterior size). After 15 compressions, 2 rescue breaths witn Ambu bag should follow and then alternating (15:2 duty cycle)	**Examiner brings AED**
	11. APPLYING THE ELECTRODE PADS	
1	Ask the assistant (examiner) to place the AED near the infant's chest, open and turn on the device, listen to the commands given by the AED. The child's age is less than 8 years, so the examiner should be asked to switch the AED to the pediatric mode, or to use the	**The examiner brings the AED, assists in applying the electrode pads, after student’s command "Do not touch infant", takes**

	STUDENT	EXAMINER
	pediatric electrode pads. Apply electrode pads on the patient's chest, in an anterior-posterior position (you can ask the examiner for help). Connect the electrode connector to the AED. "Do not touch the patient" when assessing the rhythm, stop all activities, including chest compressions. Wait for the result of the rhythm assessment.	**hands away from the infant** **Non-shockable rhythm**
12.	**CONTINUATION OF CPR AFTER RHYTHM ASSESSMENT**	
1	If shock is "not indicated", the instructions of the AED "Continue CPR" sound - immediately resume chest compressions and ventilation with an Ambu bag in the ratio of 15:2 until the next AED instruction to reassess the rhythm. Ask examiner to assist you with ventilation. In chest compressions, the student counts aloud the last 3 compessions (13-14-15).	**The examiner provides ventilation after 15 compressions.**
2	In 2 minutes, when the AED signal sounds, reassess the rhythm. Student should stop chest compressions and take his hands away from the infant, announcing to assistant “Do not touch the infant”. Change positions with the assistant on compressions, minimizing the interruption in chest compressions to 10 s	Examiner stops ventilation, removes the mask from the baby's face, when he receives the instruction "Do not touch the infant" **Non-shockable rhythm** The examiner provides chest compressions, student – ventilation
3	In 1 minute, the infant starts to cough. The student notes the need to stop CPR.	**Infant starts to cough**
13.	**CPR COMPLETION**	
1	Assess the infant's pulse on the brachial artery and breathing	Infant breathes, pulse is present
2	Positioning the unconscious child in a recovery position. Reassess breathing every minute (do not remove the AED electrodes until the ambulance arrives)	

Sequence of actions in pediatric BLS