

**MINISTRY OF HEALTH OF UKRAINE
O.O. BOGOMOLETS NATIONAL MEDICAL UNIVERSITY**

METHODOLOGICAL GUIDELINES

for a practical class for students

Elective discipline

«BASICS OF HEALTHY CHILD CARE»

**Lesson topic: VACCINATION - PROTECTION AGAINST
INFECTIONS**

Field of knowledge: I «Health Care and Social Welfare»

Specialty: I2 «Medicine»

Department of Pediatrics No. 2

Approved at the meeting of the Department of Pediatrics No. 2
of August 27, 2026, Minutes No. 1

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Corresponding Member of the National Academy of Sciences of Ukraine,

Professor

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Reviewed and approved:

Subject-specific Methodological Commission on Pediatric Disciplines

of August 28, 2026, Minutes No. 1

Head of the Subject-Specific Methodological Commission,

Professor

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Specific objectives:

1. Be able to establish initial understanding when collecting information and communicating between a medical professional and a child and their parents (legal representatives)
2. Know the national vaccination calendar, vaccine-preventable infections, vaccination reactions and complications, and contraindications to vaccination.
3. Be able to collect information about the child's vaccination status.
4. Be able to explain to patients and parents (legal representatives) what vaccines protect against.
5. Be able to analyze and explain false claims made by anti-vaccinators.
6. Be able to prepare documentation.
7. Be able to administer vaccinations.

Learning outcomes

Integral competencies: the ability to analyze a child's vaccination status and resolve vaccination issues (vaccination technique, contraindications, vaccination reactions and vaccination complications).

General competencies:

- Ability for abstract thinking, analysis and synthesis
- Ability to learn and master modern knowledge
- Ability to apply knowledge in practical situations
- Knowledge and understanding of the subject area and understanding of professional activity
- Ability to adapt and act in a new situation
- Ability to work in a team
- Interpersonal skills
- Ability to communicate in a foreign language
- Ability to use information and communication technologies
- Ability to search, process and analyze information from various sources
- Determination and persistence in the tasks set and responsibilities undertaken
- Awareness of equal opportunities and gender issues
- The ability to exercise one's rights and responsibilities as a member of society, to be aware of the values of a civil (free democratic) society and the need for its sustainable development, the rule of law, and the rights and freedoms of man and citizen in Ukraine

Special professional competencies:

- Ability to collect medical information about a patient
- Ability to adhere to the principles of medical ethics
- The ability to resolve crisis and conflict situations in doctor-patient interaction.

- Ability to assess the impact of the environment, socio-economic and biological determinants on the health of an individual, family, population
- Maintaining professional and academic integrity

Practical skills:

- Be able to establish initial understanding, communicate and collect information when communicating between a medical professional and a child and their parents (legal representatives)
- Be able to determine the child's vaccination status.
- Be able to prove the necessity and safety of vaccination; explain what it protects against.
- Be able to analyze information, myths, and fakes regarding vaccination.
- Be able to provide explanations to common questions from the child and his/her parents (legal representatives).
- Be able to prepare documentation (informed consent for vaccination and form 063).

Teaching methods:

- verbal (explanation, conversation, discussion)
- visual (demonstration)
- practical (practical work)
- clinical case method
- problem-oriented method
- “business game” method

Assessment methods:

- testing of the initial level of knowledge
- individual oral questioning
- group interview/discussion
- monitoring the performance of practical tasks (communication)
- final assessment of the level of knowledge (tests, situational tasks)

Basic level of preparation:

Studying the discipline does not require basic special training. School knowledge of anatomy, biology, and the basics of life safety.

Questions for the class:

1. The role of vaccination.
2. Classification of vaccines.
3. Vaccine-induced infections.
4. Calendar of preventive vaccinations in Ukraine.
5. How does the WHO vaccination calendar differ from the Ukrainian vaccination calendar?
6. Are additional (optional) vaccinations necessary?

7. Anti-vaccination: what it is based on, why it is dangerous, how to fight it.
8. Post-vaccination reactions and complications.
9. Ways to reduce the risk of vaccination complications.
10. Contraindications to vaccination.

Practical tasks:

1. Building trusting relationships when communicating between a medical professional and a child and their parents (legal representatives). Creating physical and emotional comfort for the patient. Role-playing games when communicating between a medical professional and a child.
2. Determining vaccination status and the required next vaccination.
3. Gathering information and determining the child's health status before vaccination.
4. Filling out the informed consent for vaccination.
5. Informing parents about vaccine reactions and actions to take in the event of vaccination reactions or complications.
6. Carrying out the vaccination procedure.
7. Filling out form 063/o

Topic content and materials for use in practical classes.

Vaccination (immunization or inoculation) is the administration of a vaccine to stimulate the body's immune system to protect it from infection or disease.

According to WHO, routine immunization saves the lives and health of 3 million children in the world annually. For some infections, there is no etiologic treatment (means aimed at eliminating the pathogen - the root cause of the disease) and the only protection is vaccination (rabies, yellow fever, measles), for some - it is not effective enough (tetanus, whooping cough).

Vaccines are immunobiological preparations that form active specific immunity:

- live but weakened strains of microbes or viruses (from chickenpox, influenza, yellow fever, measles, rubella, polio, rotavirus infection, tuberculosis, mumps);
- killed (inactivated) microbes or viruses (for rabies, typhoid fever, hepatitis A, influenza, tick-borne encephalitis, whooping cough, polio);
- toxoids (toxoids) of microorganisms (for diphtheria, tetanus);
- subunit, including synthetic vaccines, genetically engineered and molecular (for Hib, influenza, HPV, hepatitis B, whooping cough, pneumococcal and meningococcal infections).

Live attenuated vaccines (including BCG) also reduce morbidity and mortality from "non-self" infections (off-target effects).

Infections in which vaccination prevents mortality and disability, and with mass immunization allows to reduce the circulation of the pathogen and even eliminate it, are called vaccine-controlled.

(updated 26 February 2014)

Table 2: Summary of WHO Position Papers - Recommended Routine Immunizations for Children

Antigen		Age of 1st Dose	Doses in Primary Series	Interval Between Doses			Booster Dose	Considerations (see footnotes for details)
				1 st to 2 nd	2 nd to 3 rd	3 rd to 4 th		
Recommendations for all children								
BCG ¹		As soon as possible after birth	1					Exceptions HIV
Hepatitis B ²	Option 1	As soon as possible after birth (<24h)	3	4 weeks (min) with DTP1	4 weeks (min) with DTP3			Premature and low birth weight Co-administration and combination vaccine
	Option 2	As soon as possible after birth (<24h)	4	4 weeks (min) with DTP1	4 weeks (min) with DTP2	4 weeks (min), with DTP3		High risk groups
Polio ³	OPV + IPV	6 weeks (see footnote for birth dose)	4 (IPV dose to be given with OPV dose from 14 weeks)	4 weeks (min) with DTP2	4 weeks (min) with DTP3			OPV birth dose Transmission and importation risk criteria
	IPV / OPV Sequential	8 weeks (IPV 1 st)	1-2 IPV 2 OPV	4-8 weeks	4-8 weeks	4-8 weeks		
	IPV	8 weeks	3	4-8 weeks	4-8 weeks		(see footnote)	IPV booster needed for early schedule (i.e. first dose given <8 weeks)
DTP ⁴		6 weeks (min)	3	4 weeks (min) - 8 weeks	4 weeks (min) - 8 weeks		1-6 years of age (see footnote)	Delayed/ interrupted schedule Combination vaccine
Haemophilus influenzae type b ⁵	Option 1	6 weeks (min)	3	4 weeks (min) with DTP2	4 weeks (min) with DTP3		(see footnote)	Single dose if >12 months of age Not recommended for children > 5 yrs
	Option 2	59 weeks (max)	2-3	8 weeks (min) if only 2 doses 4 weeks (min) if 3 doses	4 weeks (min) if 3 doses		At least 6 months (min) after last dose	Delayed/ interrupted schedule Co-administration and combination vaccine
Pneumococcal (Conjugate) ⁶	Option 1	6 weeks (min)	3	4 weeks (min)	4 weeks		(see footnote)	Vaccine options Initiate before 6 months of age Co-administration HIV+ and preterm neonates booster
	Option 2	6 weeks (min)	2	8 weeks (min)			9-15 months	
Rotavirus ⁷	Rotarix	6 weeks (min) with DTP1	2	4 weeks (min) with DTP2				Vaccine options Not recommended if > 24 months old
	Rota Teq	6 weeks (min) with DTP1	3	4 weeks (min) - 10 weeks with DTP2	4 weeks (min) with DTP3			
Measles ⁸		9 or 12 months (6 months min, see footnote)	2	4 weeks (min) (see footnote)				Combination vaccine; HIV early vaccination; Pregnancy
Rubella ⁹		9 or 12 months with measles containing vaccine	1					Achieve and sustain 80% coverage Combination vaccine and Co-administration; Pregnancy
HPV ¹⁰		Quadrivalent 9-13 years of age Bivalent 10-13 years of age	3	Quadrivalent - 2 mos (min 4 wks) Bivalent - 1 mos (max 2.5 mos)	Quadrivalent - 4 mos (min 12 wks) Bivalent - 5 mos			Vaccination of males for prevention of cervical cancer not recommended currently

Refer to <http://www.who.int/immunization/documents/positionpapers/> for table & position paper updates.

This table summarizes the WHO vaccination recommendations for children. The ages/intervals cited are for the development of country specific schedules and are not for health workers.

National schedules should be based on local epidemiologic, programmatic, resource & policy considerations. While vaccines are universally recommended, some children may have contraindications to particular vaccines.

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BCG vaccination (injection of live attenuated tuberculosis bacillus into the bloodstream for 3-5 days) protects against severe forms (disseminated miliary tuberculosis of the lungs and tuberculous meningitis) in children of the first years of life. Hepatitis B - vaccination in the first 12 hours; the younger the age of infection, the more likely the chronic course of the disease, with the development of cirrhosis and cancer. Poliomyelitis with paralysis - in 1% of children under 5 years of age. Mortality - 5-10% in children, up to 30% - in adolescents.

Complications of diphtheria: myocarditis, polyneuritis, paralysis, visual impairment, kidney damage; up to 20% of patients die.

Tetanus is associated with convulsions, severe pain, bone fractures, and respiratory arrest. Mortality is 5-10%, with severe forms up to 50%.

Pertussis is a spasmodic cough that disrupts breathing, leads to brain hypoxia and encephalopathy. Mortality rate up to 4% in infants. Haemophilus influenzae: can cause pneumonia, meningitis, epiglottitis, arthritis, phlegmon, osteomyelitis, sepsis in the first years of life. Mortality rate in infants in Europe is 40%, in Africa - 80%.

Measles – in 30% of cases (mainly in children under 5 years of age and adults) is complicated by otitis media, pneumonia, encephalitis. Subacute sclerosing panencephalitis can develop after 7 years.

Rubella is associated with severe fetal damage.

The mumps virus affects the salivary glands, pancreas, gonads, and nervous system.

Pregnant women – all vaccines, except viral ones (MMR – no later than 1 month); influenza, ADP (over 10 years). For those in contact with a pregnant woman: all vaccines, including MMR, VV (with precautions), rotavirus (carefully with diapers). During lactation: all vaccines, except smallpox, yellow fever. VV – does not enter milk, the likelihood of rashes is very low.

In recent years, the anti-vaccination movement has intensified. Governments of different countries are fighting the dangers of anti-vaccination in different ways. For example, in Australia, for refusing to vaccinate, they deprive children of birth payments. And in Germany, they introduced a fine of 2,500 euros for refusing to vaccinate children against measles. UNICEF stated that they estimate the number of fake vaccination certificates in Ukraine in 2018 at 30%. American researchers reported that 93% of tweets about negative cases of vaccination are created by bots and trolls. Due to the high level of vaccination in past decades, there are no severe forms of controlled infections and mortality from them (it seems that there is no risk of infections). There is no constant information about the incidence, the situation in the world, reminders about the severity of infections and what vaccines are and what they protect against. There is a fear of vaccinations due to the tendency to regard any health disorder in the immediate aftermath of vaccination as a complication.

Post-vaccination complications (PVD) are hundreds of times less common than complications from infection. Death from tetanus occurs 300,000 times more often than anaphylactic shock from vaccination. The probability of a serious allergic reaction to the MMR vaccine is one reaction per million vaccinations. While out of 1,000 people infected with measles, 1 dies, 1 develops encephalitis, and 50 develop severe complications. Febrile seizures after pertussis vaccination occur 70 times less often than seizures during the disease. Only 1 victim among 1 million vaccinated per year receives compensation for PVD. There is no evidence of systemic toxic effects of vaccine preservatives when using standard doses. The connection of Thimerosal with the development of autism has also not been confirmed. In 2019, the results of a multi-year observation of 657,000 children were published, which revealed the absence of a connection between autism and vaccination. In 2010, Wakefield's article was retracted by the Lancet journal. The author was accused of fraud and removed from the UK medical register. There are studies that have shown that autism is diagnosed more often in a group of unvaccinated children compared to vaccinated children.

Adverse events following immunization (AEs). Like any medical treatment, vaccines can cause adverse events following immunization (AEs). Most of them

are minor (old name – reactions to immunization): pain at the injection site, swelling, redness, low-grade fever, etc., which appear soon after the vaccine is administered, resolve within a few days and do not require medical intervention.

Serious adverse events after immunization (SAEs) may occur extremely rarely: fever, headache, agitation, etc. Such manifestations require immediate medical attention for timely medical care. Some live vaccines can cause reactions that resemble mild diseases.

In order to reduce the risk of NPPI before vaccination, parents, when vaccinating their children, fill out a questionnaire indicating reactions to previous doses of vaccination (if any), known allergic reactions, chronic diseases. And after vaccination, children or adults are under the supervision of a doctor for at least 30 minutes in the medical institution where the vaccination was performed, in order to receive emergency assistance in a timely manner if necessary.

Situational tasks for independent work

Task 1

At the pediatrician's appointment, the mother asks whether it is possible to vaccinate a 4-year-old boy with the pneumococcal vaccine, who has had a productive cough and runny nose for a week, the disease began with a fever of 37.5 °C for 9 days, the fever lasted for 2 days. The child was vaccinated according to the WHO calendar.

Answer: There are no contraindications to vaccination.

Task 2

A six-year-old boy was brought in for a measles, rubella, and mumps vaccination. The boy's mother is 22 weeks pregnant and is worried about whether contact with a vaccinated person poses a risk to the fetus. And whether it is possible to also vaccinate the child against chickenpox.

Answer: There are no risks from the MMR vaccination. If a person vaccinated against chickenpox develops a rash on the 7th-10th day, the contents of the blisters pose a risk of infection, and the pregnant woman (or the vaccinated person) must be isolated.

Task 3.

The father of a 6-year-old girl is concerned about whether it is safe to administer 2 multi-component vaccines (MTP and DTP + polio) at once. What should the doctor explain to the father?

Answer: The immune system can produce immunity to many infections at the same time, and the child will only experience a stressful situation once, and these complex vaccines simply need to be administered in different places (distance > 10 cm, or in both hands).

Task 4

6 hours after vaccination with the DTP+polio+Hib+hepatitis B vaccine, a 1.5-year-old child developed a temperature of 38°C and redness and swelling at the injection site. What should the doctor recommend?

Answer: Reassure the mother, remind her that this is a post-vaccination reaction that occurs in some children, and give the child an antipyretic (nurofen or paracetamol) in an age-appropriate dose for pain and anxiety.

Task 5

At the pediatrician's appointment, a family brought their 5-year-old boy for a flu shot. The mother is breastfeeding her 5-month-old sister. What can the doctor suggest regarding vaccination in the family?

Answer: If the boy has not had the flu, then in a month he needs to get a second flu vaccine (up to 9 years old), up to 6 months old are not vaccinated against the flu, it is worth offering vaccination to adult family members, including the mother.

Tests

1. After what period of time can another inactivated vaccine be administered:

- a) 1 month;
- b) 2 weeks;
- c) 2 months;
- d) half a year;
- e) arbitrary interval

Correct answer: e)

2. Which vaccines are optional (optional) in Ukraine:

- a) From rotavirus infection, from hepatitis B, from human papillomavirus;
- b) from chickenpox, from pneumococcus, from polio;
- c) from rotavirus infection, from hepatitis B, from yellow fever;
- d) from chickenpox, from pneumococcus, from rotavirus;
- f) from tick-borne encephalitis, from hepatitis B, from meningococcus

Correct answer: d)

3. Which statement is false:

- a) vaccines administered to a child must be certified;
- b) routine immunization saves the lives and health of 3 million people annually;
- c) live attenuated tuberculosis bacillus is administered intravenously for 3-5 days;
- d) the infant is vaccinated against hepatitis B within the first 12 hours;
- e) for lifelong immunity to measles, a single dose of vaccine is sufficient.

Correct answer: e)

4. What is a contraindication to vaccination:

- a) allergic diseases;
- b) acute respiratory viral infection with subfebrile temperature;

- c) surgical intervention after 3 days;
- d) anaphylactic shock to a previous administration of the same vaccine;
- e) all of the above

Correct answer: d)

5. What is NOT a contraindication to vaccination:
- a) non-progressive diseases of the nervous system, including febrile seizures;
 - c) burdened family history;
 - c) treatment with antibiotics, topical steroids;
 - d) neonatal jaundice, premature birth
 - e) all of the above

Correct answer: e)

Literature

Main:

1. Nelson Textbook of Pediatrics, 2-Volume set, 22-nd edition. By Robert M. Kliegman, Bonita M.D. Stanton, Joseph St. Geme and Nina F Schor. – Philadelphia, PA: Elsevier Inc., 2024 - 4472 p. ISBN-10: 032352950X ISBN-13: 978-0323529501
2. Updated Vaccination Calendar 2026: key changes
<https://vaccine.org.ua/2025/12/22/onovlenyj-kalendar-shheplen/>

Additional:

1. Vaccine prophylaxis: achievements, problems and development prospects / Preventive medicine.- 16/Volume XXI/3.- P.56-60
2. Vaccination in various clinical conditions: recommendations of the National Institute of Health and Medical Research. Fedir Lapiy
3. Vaccines and immunization
https://www.who.int/health-topics/vaccines-and-immunization#tab=tab_1
4. Vaccines, thiomersal and autism spectrum disorder: evidence review 2010-2025
<https://www.who.int/publications/i/item/9789240123533>

Information resources:

1. http://apps.who.int/immunization_monitoring/globalsummary
2. <https://moz.gov.ua/article/ministry-mandates/nakaz-moz-ukraini-vid-19102020--2357-pro-zatverdzhennja-planu-zahodiv-schodo-efektivnogo-upravlinnja-vakcinami>