Vaccination in family medicine practice

R.Yu. Hrytsko¹, S.M. Fedorenko², N.O. Ivanchenko¹, O.Y. Snitovska¹

Danylo Halytsky Lviv National Medical University
Lviv Regional Infectious Clinical Hospital

Vaccination is the most effective measure against infectious diseases. Due to vaccinations, smallpox was eliminated, poliomyelitis and tetanus morbidity decreased dramatically. According to WHO, 12 million children around the world annually die from infectious diseases. Of these, 7.5 million lives are lost to diseases against which we do not yet have vaccines, but more than 4 million people die from preventable diseases. Immunization is currently considered to be one of the most effective and cost-effective medical interventions in the epidemic process. The more economically developed a country is, the more diseases is its population protected from with the help of immunoprophylaxis. In order to create herd immunity, WHO recommends that at least 95% of individuals should be vaccinated. However, in the Lviv region and Ukraine there is a negative tendency to reduce the coverage of preventive vaccinations up to 45–53%, which is a danger of the emergence and epidemic spread of preventable diseases.

The objective: was to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

Materials and methods. Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness.

Conclusions. There is a necessity of continuous professional development of physicians on immunoprophylaxis, including training, theoretical improvement courses, internships in European countries and Ukrainian vaccination centers.

Key words: vaccination, family doctor, contraindications, vaccination conditions.

Вакцинация в практике семейного врача

Р.Ю. Грицко, С.М. Федоренко, Н.О. Иванченко, О.Й. Снітовська

Вакцинация является наиболее эффективным способом борьбы с инфекционными болезнями. Благодаря вакцинациям была ликвидирована натуральная вспышка, резко снизилась заболеваемость полиомиелитом, правец. За эти годы в Украине было привито 12 млн детей. Из этого числа 7.5 млн детей вакцинировано против 10 инфекционных болезней. Всего было привито 200,000 детей в возрасте до одного года и 1,5 млн взрослых.

Мета дослідження: аналіз нормативно-правових документів з питань імунопрофілактики, особливості планування профілактичних щеплень, умови проведення щеплень.

Заключение. На сегодняшний день необходимость в постоянном профессиональном развитии врачей по вопросам иммунопрофилактики, в том числе профессиональные возможности, условия проведения вакцинации.

Ключевые слова: вакцинация, семейный врач, противопоказания, условия проведения вакцинации.

Vaccination in family medicine practice

R.Yu. Hrytsko¹, S.M. Fedorenko², N.O. Ivanchenko¹, O.Y. Snitovska¹

Danylo Halytsky Lviv National Medical University
Lviv Regional Infectious Clinical Hospital

Vaccination is the most effective measure against infectious diseases. Due to vaccinations, smallpox was eliminated, poliomyelitis and tetanus morbidity decreased dramatically. According to WHO, 12 million children around the world annually die from infectious diseases. Of these, 7.5 million lives are lost to diseases against which we do not yet have vaccines, but more than 4 million people die from preventable diseases. Immunization is currently considered to be one of the most effective and cost-effective medical interventions in the epidemic process. The more economically developed a country is, the more diseases is its population protected from with the help of immunoprophylaxis. In order to create herd immunity, WHO recommends that at least 95% of individuals should be vaccinated. However, in the Lviv region and Ukraine there is a negative tendency to reduce the coverage of preventive vaccinations up to 45–53%, which is a danger of the emergence and epidemic spread of preventable diseases.

The objective: was to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

Materials and methods. Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness.

Conclusions. There is a necessity of continuous professional development of physicians on immunoprophylaxis, including training, theoretical improvement courses, internships in European countries and Ukrainian vaccination centers.

Key words: vaccination, family doctor, contraindications, vaccination conditions.

Вакцинация в практике семейного врача

Р.Ю. Грицко, С.М. Федоренко, Н.О. Иванченко, О.Й. Снітовська

Вакцинация является наиболее эффективным способом борьбы с инфекционными болезнями. Благодаря вакцинациям была ликвидирована натуральная вспышка, резко снизилась заболеваемость полиомиелитом, правец. За эти годы в Украине было привито 12 млн детей. Из этого числа 7.5 млн детей вакцинировано против 10 инфекционных болезней. Всего было привито 200,000 детей в возрасте до одного года и 1,5 млн взрослых.

Мета дослідження: аналіз нормативно-правових документів з питань імунопрофілактики, особливості планування профілактичних щеплень, умови проведення щеплень.

Заключение. На сегодняшний день необходимость в постоянном профессиональном развитии врачей по вопросам иммунопрофилактики, в том числе профессиональные возможности, условия проведения вакцинации.

Ключевые слова: вакцинация, семейный врач, противопоказания, условия проведения вакцинации.

Vaccination is the most effective measure against infectious diseases. Due to vaccinations, smallpox was eliminated, poliomyelitis and tetanus morbidity decreased dramatically. According to WHO, 12 million children around the world annually die from infectious diseases. Of these, 7.5 million lives are lost to diseases against which we do not yet have vaccines, but more than 4 million people die from preventable diseases. Immunization is currently considered to be one of the most effective and cost-effective medical interventions in the epidemic process. The more economically developed a country is, the more diseases is its population protected from with the help of immunoprophylaxis. In order to create herd immunity, WHO recommends that at least 95% of individuals should be vaccinated. However, in the Lviv region and Ukraine there is a negative tendency to reduce the coverage of preventive vaccinations up to 45–53%, which is a danger of the emergence and epidemic spread of preventable diseases.

The objective: was to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

Materials and methods. Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness.

Conclusions. There is a necessity of continuous professional development of physicians on immunoprophylaxis, including training, theoretical improvement courses, internships in European countries and Ukrainian vaccination centers.

Key words: vaccination, family doctor, contraindications, vaccination conditions.
The objective: to analyze the legislative framework on immunoprophylaxis, the peculiarities of planning preventive vaccinations, the requirements for vaccination offices and modern contraindications for vaccination.

MATERIALS AND METHODS

Legal documents on immunoprophylaxis were analysed, 210 family doctors were surveyed on immunoprophylaxis awareness with the help of Google platform.

At present, a vaccine is a medical immunobiological preparation designed to create specific immunity to an infectious disease. Vaccines are made from weakened or inactivated microorganisms, their byproducts or antigens obtained by genetic engineering or chemical methods.

Modern vaccines are divided into the following groups:

- a) vaccines made from living pathogens with impaired virulence (against smallpox, tuberculosis, plague, anthrax, rabies, polio (oral), etc.);
- b) vaccines inactivated from killed pathogenic microbes (cholera, typhoid, pertussis, polio, leptospirosis, etc.);
- c) anatoxins (made from exotoxins of the respective pathogens, processed with a 0.3–0.4% formalin solution and kept at a temperature of 38–40 °C for 3–4 weeks);
- d) chemical vaccines (they are not made from whole bacterial cells, but from chemical complexes made by processing cell suspension with special methods);
- e) genetically engineered (against viral hepatitis B).

Besides antigens that cause the immune response, vaccines contain a large number of other substances, including solvents, stabilizers, culture media components, preservatives, adjuvants, antibiotics. [5]. The legal documents regulating immunoprophylaxis measures in Ukraine are:

- Law of Ukraine N2802-XII from19/11/1992 ‘Fundamentals of the legislation of Ukraine on health care’, Article 10. Citizens of Ukraine are obliged to: a) take care of their health and the health of children, not harm the health of other citizens; b) undergo preventive medical examinations and be vaccinated in cases provided by law. Article 78. Professional duties of medical and pharmaceutical workers. Medical and pharmaceutical workers are obliged: a) promote the protection and promotion of human health, prevention and treatment of diseases, and provide timely and qualified medical and therapeutic care.
- Law of Ukraine № 4004-XII 24/02/1994 ‘On ensuring the sanitary and epidemic well-being of the population’. Article 5. Citizens are obliged to take care of their health and the health and hygienic education of their children, not harm the health of other citizens; undergo compulsory medical examinations and be vaccinated in cases provided by law.
- Law of Ukraine № 404-XII 24/02/1994 ‘On ensuring the sanitary and epidemic well-being of the population’. Article 5. Citizens are obliged to take care of their health and the health and hygienic education of their children, not harm the health of other citizens; undergo compulsory medical examinations and be vaccinated in cases provided by law.

Performing preventive vaccinations requires a Vaccination Point, which can be either permanent or temporary (for 24 hours). The permanent vaccination point must be equipped with:

- a refrigerator for storing vaccines and anatoxins;
- a thermometer in the refrigerator on the second shelf and a thermometer to validate its readings;
- refrigerator bag with two sets of cold storage elements and a thermometer;
- a table for the refrigerator bag, injection materials and a box for safe disposal of syringes;
- sets of medicines and medical supplies and first aid kits for emergency medical care;
- a box for safe disposal of syringes;
- a couch for preventive vaccination and swaddling of the baby as required, or a chair;
- equipped area for hand hygiene (water, soap), dispenser with antiseptic for treatment of skin of the hands;
- a bactericidal irradiator or other device for air disinfection;
- information materials, vaccination posters, and educational guides, including visuals for emergency medical care that may occur after the administration of immunobiological preparations (if possible);
- indoor thermometer.

Temporary vaccination points can be equipped without a refrigerator; it is enough to have two refrigeration bags with thermometers and a corresponding number of cold elements depending on the volume of vaccines [7].

Who should be vaccinated by a family doctor? A family doctor vaccinates children and adults requiring age-appropriate preventive vaccination according to the vaccination calendar and the child was not in contact with infectious patients or bacterial carriers.

In Ukraine, the organization of preventive vaccinations is performed according to:

- the requirements of MOH of Ukraine from September 16, 2011 N 595, registered at the Ministry of Justice of Ukraine on October 10, 2011 as N 1159/19897 (as reviewed in the order of MOH of Ukraine from August 11, 2014 N 551) ‘On the Procedure for Preventive Vaccinations in Ukraine and Quality Control and Circulation of Medical Immunobiological Preparations’;

- Order of MOH of Ukraine from 18.05.18 No. 947 ‘On Amendments to the Calendar of Preventive Vaccinations in Ukraine’;
- Order of MOH of Ukraine No.2070 of 11.10.2019, registered at the Ministry of Justice of Ukraine on November 26, 2019 as No. 1182/34153 “On Amendments to the Calendar of Preventive Vaccinations in Ukraine and the List of Medical Contraindications to Preventive Vaccinations”;

- Order of MOH of Ukraine No. 280 from February 1, 2019 “On Amendments to the Regulations of the Organization of Preventive Vaccinations and State Sanitary Rules and Regulations “Sanitary anti-epidemic requirements for health care institutions providing primary health care” registered at the Ministry of Justice of Ukraine from February 28, 2019 No. 213/33184.

- Order of MOH of Ukraine from 18.05.2018 No. 948 ‘On the Approval of the Methodology for determining the need for Immunobiological Preparations and Medical Products used for Preventive Vaccinations ...”

Thus, the calculation of all data in the planning of preventive vaccinations and requirements for immunobiological preparations is performed using electronic resources. The WHO Tool is used to calculate the need for immunobiological preparations (vaccines) and medical devices for additional vaccination activities. The Tool calculates the requirement for years with a maximum planning period of 3 years, with the possibility of calculating 10 additional measures involving vaccination [6].

Performing preventive vaccinations requires a Vaccination Point, which can be either permanent or temporary (for 24 hours). The permanent vaccination point must be equipped with:

- a refrigerator for storing vaccines and anatoxins;
- a thermometer in the refrigerator on the second shelf and a thermometer to validate its readings;
- refrigerator bag with two sets of cold storage elements and a thermometer;
- a table for the refrigerator bag, injection materials and a box for safe disposal of syringes;
- sets of medicines and medical supplies and first aid kits for emergency medical care;
- a box for safe disposal of syringes;
- a couch for preventive vaccination and swaddling of the baby as required, or a chair;
- equipped area for hand hygiene (water, soap), dispenser with antiseptic for treatment of skin of the hands;
- a bactericidal irradiator or other device for air disinfection;
- information materials, vaccination posters, and educational guides, including visuals for emergency medical care that may occur after the administration of immunobiological preparations (if possible);
- indoor thermometer.

Temporary vaccination points can be equipped without a refrigerator; it is enough to have two refrigeration bags with thermometers and a corresponding number of cold elements depending on the volume of vaccines [7].

Who should be vaccinated by a family doctor? A family doctor vaccinates children and adults requiring age-appropriate preventive vaccination according to the Calendar (Image 1).
A family doctor also vaccinates children and adults who are overdue for vaccination. They are vaccinated according to the rules for Vaccination of children with calendar disruption. The basic principle is: all received doses are counted, the following are administered keeping the minimum intervals between vaccinations (Table 2).

According to the CDC guidelines and the legislation of Ukraine, 2 or less inactivated vaccines and/or anatoxins can be administered simultaneously. Live vaccines and inactivated vaccines or anatoxins can be administered simultaneously in different areas of the body or with any interval between doses, according to the instructions. 2 or less live vaccines for parenteral administration (except BCG) can be administered simultaneously in different areas of the body or with an interval of at least 1 month[8].

Besides the 10 infections guaranteed by the State free of charge, there are recommended vaccines that can be obtained at one’s

### Preventive Vaccination Calendar

| Age           | Hepatitis B | Diphtheria, whooping cough, tetanus | Poliomyelitis | Hemophilic infection | Measles, rubella, mumps |
|---------------|-------------|------------------------------------|---------------|----------------------|------------------------|
| 1 day         |             |                                    |               |                      |                        |
| 3–5 days      | Tuberculosis|                                    |               |                      |                        |
| 2–months      | Hepatitis B |                                    |               |                      |                        |
| 4 months      |             |                                    |               |                      |                        |
| 6 months      |             |                                    |               |                      |                        |
| 12 months     |             |                                    |               |                      | Hemophilic infection   |
| 18 months     |             |                                    |               |                      | Measles, rubella, mumps|
| 6 years       | Diphtheria, tetanus |                                    |               |                      |                        |
| 14 years      |             |                                    |               |                      |                        |
| 16 years      |             |                                    |               |                      |                        |
| 26 years      |             |                                    |               |                      |                        |

### Minimum Intervals between Vaccinations

**For children from 2 months to 6 years 11 months 29 days**

| Vaccines, anatoxins | 1–2-nd dose | 2–3-rd dose | 3–4-th dose |
|---------------------|-------------|-------------|-------------|
| DTP-1, DTaP-1       | 1 month     | 1 month     | 6 months    |
| Td                  | 1 month     | 9 months    |             |
| For poliomyelitis   | 1 month     | 1 month     | 6 months    |
| For hepatitis B     | 1 month     | 1 month     |             |
| For measles, mumps, rubella- | 1 month | | |
| Hib-vaccine         | 1 month, the 2-nd dose is not administered if the 1-st dose is administered at the age from 12 months to 4 years 11 months 29 days | 6 months, the 3-rd is not administered if the 2-nd dose is administered at the age from 12 months to 4 years 11 months 29 days | |

**For children from 7 to 17 years 11 months 29 days**

| Vaccines, anatoxins | 1–2-nd dose | 2–3-rd dose | 3-4-th dose |
|---------------------|-------------|-------------|-------------|
| Td-6                | 1 month     |             | 6 months    |
| For measles, mumps, rubella- | 1 month | | |
| For hepatitis B     | 1 month     | 1 month     |             |
| For poliomyelitis - | 1 month     | 1 month     | months      |
own expense or through regional programs. The recommended vaccines include vaccination against rotavirus, influenza, meningococcal infection, pneumococcal and papillomavirus infections, chickenpox, hepatitis A and hepatitis B for adults. For pregnant women, a vaccination against whooping cough is also recommended at 27-36 weeks of gestation to protect the baby from whooping cough until the moment of its vaccination and to protect the mother. Revaccination is also recommended for all family members. This strategy is called «Coscom».

The CDC Advisory Committee on ACIP Immunization Practices recommended this strategy as early as 2011 [9]. However, this practice has not yet been widely used in Ukraine.

Among the recommended vaccines, the most widely used is the influenza vaccine. The influenza vaccination is especially needed for individuals at risk (patients with chronic respiratory and cardiovascular diseases, patients with diabetes, obesity, immunodeficiency, pregnant women, children under 5 years and people over 65) and social risk factor groups (medical, educational, transportation, trade, etc.). Influenza vaccinations should be done annually as recommended by WHO, since the vaccine strain composition changes annually according to the variability of pathogens in nature. Vaccinations should be taken before the epidemic rises, but can be used against influenza and URTI. Immunity is formed within 14 days. Protection lasts from 6 months to 1 year [10].

Among the recommended vaccinations, the number of individuals vaccinated against yellow fever is increasing every year as they travel to the countries at risk – Benin, Burkina Faso, Cameroon, Congo, Ivory Coast, Gabon, Ghana, Liberia, Mali, Rwanda, Nigeria, Guinea-Bissau, Burundi, Guyana, Togo, Sierra Leone, Caribbean, Trinidad. Vaccinations are carried out 10 days before the departure to the endemic country [11].

To date, the only absolute contraindication to preventive vaccinations is anaphylactic reaction to prior administration of this vaccine or its components. Live vaccines are contraindicated for pregnant women and those with AIDS. The relative contraindications include the period of acute illness. Increase of body temperature to 38 degrees does not justify refusal of vaccination [12].

Through the Google platform, we have conducted surveys on vaccination awareness among 210 family doctors. They were asked to complete a questionnaire on 26 questions. According to the survey, only 26% of respondents had knowledge of vaccination legislation. 63% of respondents were unaware of the possibility of creating temporary vaccination points. 18% of respondents incorrectly answered the question about the type and composition of vaccines. 53% of respondents do not consider it possible to vaccinate pregnant women against influenza. 3% of respondents do not practice the recommended vaccination at all. 13% of respondents do not administer multiple compatible vaccines during one visit.

CONCLUSIONS

Immunoprophylaxis is a state security issue. In the period of reforming medicine, the importance of a family doctor in society has increased dramatically [13]. Trust in a family doctor is the key to success of public health. Continuous professional development of family doctors in immunoprophylaxis is a required aspect of the success of the healthcare reform of Ukraine.