

Vaccine registration

Vaccines are biological preparations with antigenic properties , which trigger the appearance of the immune response in the organisms subjected to vaccination.

Conventional vaccines consist of:

- live attenuated microorganisms
- inactivated microorganisms
- purified microbial components, protein or protein conjugated polysaccharides
- recombinant proteins.

The immunization scheme in Romania includes:

- **Mandatory vaccinations:** BCG, DTaP, Td, IPV, anti-hepatitis B vaccination, Haemophilus influenzae type B (HiB), anti-pneumococcal, measles-mumps-rubellavaccination
- **compulsory vaccinations in special epidemiological situations, in territories with high risk of illness or in case of need:** antimalarial, antirabic vaccination
- **optional vaccinations:** anti-viral, anti-hepatitis A, influenza, anti-meningococcal

Vaccinations required

- **BCG** - a first dose at maternity discharge. Subsequently, a further dose may be administered, depending on the result of the IDR test in PPD, in 8th grade.
- **DTP** - is administered, as a first vaccination, at 2, 4 and 11 months, with the booster at 6 years and booster at 14 years.
- **Td** - is administered at 14 years (8th grade).
- **Td** - in pregnant women in the 8th month of pregnancy and periodically adults of both sexes, as a booster (at intervals of 10 years).
- **IPV** - is given as a first vaccination at 2, 4 and 11 months, followed by booster doses at 6 years
- **Hep B** - is given at birth, at 2, at 4 months, at 11 months,
- **Measles-mumps-rubella** - is given instead of the anti-measles vaccine, a first dose between 12 and 15 months and a booster dose at 5 years.
- **HPV vaccine** - in girls 12-13 years, in the sixth grade, 3 doses are given.
- **HiB vaccine** - is given as a **prime** vaccination at 2, 4 and 11 months. Between 6 and 11 months, in previously unvaccinated patients, 2 doses are administered, every 4-8 weeks. Only one dose of vaccine is given to children over 12 months unvaccinated and adults with risk factors.
- **Antipneumococcal** - at 2, 4, 11 months.

Optional vaccinations

- **Anti-varicose veins** :
 - in those between 1 and 12 years, 2 doses at least 6 weeks apart
 - a single dose for those over 12 years.
- **Antihepatitis A** - starting at 1 year and 9 months, an initial dose followed by a booster over 6 months.
- **Flu** - after the age of six months each year before the influenza season (October).
- **Antipneumococcal** - at risk categories and in people over 60 years.
- **Antimeningococcal** - In infants and young children, aged 2 months - 2 years, it is recommended to administer the conjugated antimeningococcal vaccine. After the age of 2 years, vaccination with A + C vaccine is indicated.

Contraindications and precautions

- the need to know the excipients of each vaccine to avoid side effects epinephrine (adrenaline) is necessary to be available in the event of allergic reactions that may lead to anaphylactic shock
- the occurrence of serious side effects at first administration (collapse, encephalitis shock, seizures, etc.) contraindicates the next dose repetition if adverse reactions occur to the pertussis component of DTaP, this will be omitted, at the next vaccination using Td avoiding vaccine administration in acute diseases which could compromise the immune response, with the exception of minor infections, without fever or other systemic manifestations
- the use of alcohol or other disinfectants at the injection site may inactivate a live virus vaccine unless evaporation of the disinfectant is expected
- avoidance of intramuscular administration of vaccines in persons with haematological diseases (haemophilia, thrombocytopenia)

If two live virus vaccines, which are not compatible with the combined preparation, are required, they can be administered simultaneously only at different locations and with different syringes (preferably at least 3 weeks apart) .

Live virus vaccines are contraindicated in the following situations:

- **pregnant women** - because of the risk of fetal malformations (only if the degree of exposure is very high)
- **administration of immunoglobulins** contraindicates the use of live virus vaccines at intervals of less than 3 weeks before or after administration
- people with **malignancies** (leukemia, lymphomas, tumors)
- **immunocompromised** (HIV / positive, immunosuppressants, corticosteroids, radiotherapy)
- infants can develop a mild or severe measles infection after 9 months of RA vaccination - a minimum dose of 6 months or 1 year (1 year and 1 month) is recommended.
- individuals with symptomatic HIV infection have contraindicated the BCG vaccine or yellow fever
- children and women of symptomatic HIV-positive offspring should receive DTP, HBV and PA vaccine
- anaphylactic history of vaccine or vaccine constituents
- acute diseases with moderate or severe evolution, with or without fever
- immunosuppressive treatments, chemo and radiation therapy, corticotherapy require postponement of vaccination by 3 months
- pregnant women, HIV infections and immunosuppressants have contraindications for live vaccines
- in children who presented with high fever, crying inconsolable, convulsions shock at a DTP dose
- mild respiratory infections, mild and moderate local reactions, antibiotic therapy, acute illness convalescence, severe postvaccine history in the family, diarrhea are not contraindications.

BCG vaccination

- vaccine from live attenuated strains
- intradermal administration on the first day of life
- 0.1ml dose
- deltoid region of the left arm
- after 3 weeks a small nodule appears, and after 2-3 months a pustule appears which fistulizes or not and will leave a depigmented scar and slightly uneven

Absolute contraindication - positive reaction to tuberculin, HIV positive.

- PPD IDR:
 - intradermal administration in the forearm of 0.1 ml PPD
 - read after 72 hours
 - negative when the papule is 0-9 mm
 - positive when it is over 9 mm or looks like phlegm, necrosis, ulceration.

Complications: - abscesses at the place of inoculation - lymphadenitis - disseminated BCG infection

AHB vaccination

- Recombinant vaccine (Engerix B) or inactivated vaccine
- Intra-muscular administration of 0.5 ml in the first week of life
- Effective at least 10 years, then anti-HBs antibody determination

Contraindications: anaphylactic reactions to constituents.

Side effects:

- subfebrility
- abdominal pain
- headache
- asthenia, dizziness
- eruptions
- local signs

DTaP vaccination

- Contains tetanus **diphtheria** , tetanus **toxoid** and corpuscular vaccine **pertussis** inactivated
- Intra-muscular administration of 0.5 ml

Contraindications:

- encephalopathy with onset 7 days after the first dose
- fever higher than 40.5 ° C in the first 48 hours
- collapse / shock in the first 48 hours
- persistent crying for the first 48 hours (over 3 hours)
- seizures in the first 3 days after vaccination.

Side effects:

- - local: erythema, nodule, spontaneous pain or palpation
- - general: fever.

Antipoliomyelitis vaccination

- contains inactivated strains (IPV) or live attenuated vaccine
- VPOT is given per 0.2 ml bone (2 drops), if regurgitation occurs within the first 5-10 minutes, re-administer. (currently this form is no longer used)

Side effects:

- - pharyngitis
- - 1-2 soft chairs

Measles, mumps and rubella vaccination

- Vaccines with live attenuated viruses are used.
- Two doses of vaccine are effective against **measles, mumps and rubella**
- Revaccination prevents measles, even in those who have not been seroconversion at the first vaccination.

Side effects

- It can rarely cause thrombocytopenia, hives or anaphylaxis (0.1-5 per 100,000 cases).
- In children with compromised immune system, deaths due to the viral infection associated with the vaccine were recorded.

Recent studies indicate excellent serological response and similar clinical efficacy in vaccinated children between 12 and 14 months (because maternal antibodies drop faster in vaccinated mothers than in those where antibodies are a consequence of natural infection).

The hepatitis A vaccination - in Romania is one of the optional vaccinations.

- monovalent vaccine, is given from the age of 1 year and 9 months. Vaccination consists of 1 dose initially administered, followed by a booster at 6-12 months intervals.
- bivalent vaccine (HepA-HepB combination vaccine) 3 doses are used at 0, 1 and 6 months.
- The efficacy of immunization was 94% at 12 months and 100% at those receiving the second dose at 17.5 months.

Side effects

- Mild local reactions (pain, increased sensitivity, swelling and redness) and minor systemic symptoms (fever, migraine, discomfort). Symptoms are more pronounced after the second or third dose.

HiB vaccination

- It is effective in preventing **Haemophilus influenzae type b** infections, which, together with meningococcus and pneumococcus, is one of the main bacteria that cause invasive infections with a lethal potential at childhood.
- One dose at 2 months, then at 4 months, then at 11 months
- In children aged 15-59 months, a single dose is administered.
- After 59 months, the vaccine is only recommended for those at risk: asplenic, immunodeficiencies, asymptomatic HIV infection.
- the Hib vaccine exists as a monovalent vaccine or included in multivalent vaccines (Hexavalent DTaP + AP + AHB + Hib vaccines) (**Infanrix hexa or Hexacima**)
- In infants between 6 and 11 months not previously immunized, it is recommended to administer 2 doses of Hib vaccine, every 4-8 weeks, with a seroconversion rate of 93-100%. And in this case a reminder is required in the second year of life.
- In unvaccinated children above 1 year of age and in adults in at-risk groups, a single dose of vaccine is sufficient.

Effectiveness

- The Hib vaccine contains capsular polysaccharide fractions (RPF)
- Compared to the pure polysaccharide vaccine, the conjugated vaccine contains a carrier protein recognized by T lymphocytes, stimulating T-dependent immunity, provoking an immune response to polysaccharide hapten.

Pneumococcal vaccination

- is used in the mandatory scheme, vaccination with pneumococcal polysaccharide conjugate vaccine (13-valent, adsorbed), which is given at 2 months, 4 months and 11 months.

Immunocompetent persons:

- - the elderly 65 and over
- - patients with chronic cardiovascular disease, chronic lung disease or diabetes
- - patients with alcoholism, chronic liver disease or LCR loss
- - persons living in disadvantaged social environments or in special environmental conditions
- - persons with anatomical or functional asplenia

Immunocompromised people:

- patients with HIV infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancies, chronic renal failure, nephrotic syndrome, immunosuppressive chemotherapy, marrow or organ transplant.

The heptavalent conjugated pneumococcal vaccine is indicated for the active immunization of infants and children between 2 months and 2 years of age against invasive pneumococcal disease caused by the serotypes included in the vaccine:

- In infants between 6 and 11 months - 2 doses of vaccine at a minimum of 1 month between doses.
- A booster dose is recommended in the second year of life. In children aged 12-23 months, two doses are administered at least 2 months apart.
- The 23-valent pneumococcal polysaccharide vaccine is administered starting at 2 years of age, in single dose, at risk categories. It is effective for a period of 4-5 years. Booster doses are required every 5 years.
- a new heptavalent pneumococcal vaccine (7 polysaccharide pneumococcal antigens) conjugated to CRM197 (PREVENAR), with 94% efficacy against invasive pneumococcal diseases caused by vaccine-covered strains recommended in all age groups.
- Since April 2009, the use of the decavalent vaccine (SYNFLORIX) has been approved, which prevents the development of more pneumococcal diseases than the heptavalent variant, offering protection against three other pneumococcal strains (serotypes 1, 5, 7F) - recommended only in children under 2 years.

Optional vaccines:

Antimeningococcal vaccination

- Vaccination with a C-conjugated vaccine
- In infants, the vaccine is given at 2, 4 and 6 months of age.
- In infants between 4 and 11 months not previously immunized, 2 doses of vaccine should be recommended at least 4 weeks apart.

- In children between 1 and 4 years of age, adolescents and young adults not previously immunized, a single dose of vaccine is given.
- For children over 5 years until adolescence, a single dose of vaccine is indicated.

The varicella-zosterian vaccine

- The varicella-zosterian vaccine with attenuated live strain Oka has a 98% efficacy in the prevention of varicella.
- The duration of post-vaccine protection is 7-10 years, after 17-20 years only 2 of the 96 adults vaccinated in childhood had clinical infection but with much attenuated forms.
- It is given subcutaneously.

Antirovirus vaccination

- Rotarix is used to vaccinate infants from 6 weeks of age to prevent gastroenteritis caused by rotavirus infection.
- **Rotarix** is a vaccine that is administered **orally** , contains an attenuated form of human rotavirus, prevents gastroenteritis produced by type G1 and type nonG1 (G3, G4 and G9).
- It is available in two forms:
 - as a powder and solvent that is mixed to obtain an oral suspension, which is administered immediately after establishment.
 - as an oral suspension in a pre-filled applicator.
- **RotaTeq** oral vaccine, contains a mild form of human rotavirus, prevents gastroenteritis produced by type G1, G2, G3, G4 and P1).
- The vaccine is given in two doses, at least 4 weeks apart. It is preferable for both doses to be given before 16 weeks, not later than 24 weeks.
- Rotarix can be co-administered with other vaccines.
- It is not necessary to stop feeding the baby, the baby can breastfeed both before and after administering the vaccine.
- The vaccine is contraindicated in infants who have been diagnosed with congenital malformations of the gastrointestinal tract or have hypersensitivity to the components of the vaccine, to infants with immunological deficiencies or neoplasms.
- It is also not used in infants with acute diarrhea or vomiting.

Effectiveness

- 78-95% post-vaccine seroprotection is considered, by the appearance of IgA antibodies.
- The effects of Rotarix were first studied in experimental models, then in human patients.
- In total, clinical trials on the use of Rotarix in human patients included 72,000 children and were conducted in several countries. The main randomized, double-blind, placebo-controlled study evaluated the efficacy and safety of Rotarix and involved more than 63,000 children. Efficacy was measured by evaluating the number of children with severe rotavirus gastroenteritis after vaccination.

Adverse effects

- Most patients (1 in 10) experienced irritability and loss of appetite.

Other side effects: cough, diarrhea, fever within the first 24 hours.

HPV vaccination

- HPV (Human Papilloma Virus) infection may be asymptomatic and may cause venous warts or neoplasms. Over 100 HPV (Human Papilloma Virus) serotypes are known:
- **HPV-1 causes plantar warts,**
- **HPV-6 and HPV-11 venereal warts (anogenital),**
- **HPV-16 and HPV-18 cause cervical dysplasia.**

There are three types of HPV vaccines:

- **Gardasil / Silgard** (contains antigens against HPV 6,11,16,18 serotypes, microparticles assembled by genetic recombination)
- **Cervarix** (contains antigens against HPV serotypes 16,18, microparticles assembled by genetic recombination)
- **Gardasil 9 / Silgard 9** (contains antigens against HPV serotypes 6, 11, 16, 18, 31, 33, 45, 52, 58).

Effectiveness

- Vaccination does not ensure healing if HPV infection 16 and 18 already exist.
- in girls in the 10-15 year age group, the body's immune response to HPV vaccination, as measured by specific anti-HPV antibody levels, is twice as high as in girls and women in the 16-25 age group. years.
- also taking into account the fact that it is preferable that HPV vaccination be done before the beginning of the sex life in order to prevent a possible infection from the first sexual contact, the states that have decided to introduce in the national programs for the prevention of cervical cancer. vaccination should be carried out around the age of 10-15 years.

Adverse effects

- 6% major adverse effects
- Several cases of Guillain-Barre syndrome have been reported.
- Pulmonary thromboembolism in people with risk factors for thromboembolism
- 94% minor adverse effects:
- injection site pain, fever, headache, nausea, anaphylactic shock, bronchospasm.
- Lower frequency: epilepsy, paralysis, panic attacks, circulatory disorders, malaise, hair loss, amenorrhea, joint pain, erythema, increased fatigue, tremors, paresthesias (burning sensation) in the legs and face.

Creating a diet for the healthy man

An organized lifestyle , which respects the general principles of nutrition and optimal physical activity level , is the prerequisite for obtaining and maintaining the best health.

Optimal nutrition guidelines:

- it is necessary that the caloric intake is equal to the energy expenditure, at a total calculated calorie level

General considerations:

- meal / day structure: **3 main meals and 2 snacks** , in the interval of 2.5-3 h.
- ensuring **optimal caloric requirements** for reaching or maintaining ideal body weight (women < men).
- complex carbohydrates and fiber (**raw fruits and vegetables, whole grains**)
- healthy vegetable fats (in moderation),
- **high quality protein** (eggs, meat, fish, cheese and semi-skimmed milk)

- calcium (**dairy**)
- proper hydration (preferably **water**).
- **avoiding** commercially packaged foods with added sugar, salt, saturated / trans fats (**chips, sticks, puffs, wafers, chocolate, ice cream, candies, etc.**).
- avoiding fast food,
- low intake of alcoholic beverages
- compliance with the restrictions imposed by **food allergies / intolerances** and digestive diseases (ulcer, gastritis, lithiasis, inflammatory bowel disease, irritable bowel syndrome, etc.).
- cooking methods: avoiding oil frying and simmering food; it is preferred that they be **cooked, chopped, steamed, baked, grilled.**
- **fruits** , it is preferred that they be **consumed in full, with rind.**

Fat:

- total **fat** intake **<30%** of total calories / day;
- avoidance of animal fats (fatty meat, lard, cheese and high fat dairy) in favor of vegetables (varieties of walnuts, olive oil, sunflower, seeds, avocado).

Carbohydrates :

- consumption of fruits, vegetables and legumes, variety of nuts and whole grains.
- ~ 400 g (**5 servings**) of fruits and vegetables / day and their introduction to each meal
- simple sugar intake <10% of total calories; the reduction <5% brings additional benefits.
- avoiding soft drinks / carbonated drinks from the trade (high sugar content).

Salt:

- iodized salt intake **<5 g** / day to reduce the risk of hypertension, heart disease and stroke.

Healthy dish principles:

- **half** of the contents of the plate must be **fruits and vegetables** (fiber, vitamins, minerals); they lower the risk of cardiovascular disease, stroke and certain cancers
- **a quarter** is occupied by **whole grains** (brown rice, wholemeal bread, whole-grain oatmeal);
- **last quarter** : **meat** (poultry, beef, pork), seafood, eggs, nuts, dried legumes, dairy / semi-degreased cheeses. **Fish consumption** is encouraged in **2 servings / week** (tuna, mackerel, ash)
- **snacks** between meals: **raw fruits / vegetables, whole grains** (biscuits, bakery products); lean meat, semi-skimmed cheeses and dairy products, eggs; varieties of nuts or unsalted seeds;
- reduction of daily **salt** intake (2,000 mg sodium / 5 g salt / teaspoon), **sugar** 8 teaspoons sugar / 40-55 g

Creating a diet for the healthy man

- **Brown rice / whole grains: 5-7**
- - 2 slices of bread (60 g)
- - 100 g rice, noodles, spaghetti
- - 4 simple biscuits
- - 1 large potato (180 g)

- - 40 g corn flakes
- **Vegetables: 2**
- - 100 g vegetables with / without cooked leaves
- - 150 g vegetables with raw leaves
- - 100 g vegetables without raw leaves
- **Fruits: 2**
- - 130 g (1 small fruit) apple, orange, pear, mango, pineapple, papaya, melon
- - 50 g grapes (10 grains)
- - 40 g dried fruits
- **Meat and others: 2-3**
- - 90 g fish, lean meat, skinless bird (palm bridge)
- - 120 g lentils, peas, beans, etc.

Physical activity

Performing regular physical activity at optimal intensity level has many benefits for the health status, including:

- **decreased all-cause mortality** , risk of ischemic heart disease, hypertension, stroke, type 2 diabetes, metabolic syndrome, breast and colon cancer, and depression.
- low risk of vertebral or hip fracture.
- **increased cardio-respiratory and muscular tone** .
- facilitating reaching and maintaining optimal body weight

Indications for adults (18-64 years):

- weekly performance of **150 min. moderate / intense aerobic physical activity** of 75 min. vigorous aerobic activity or a combination of the two variants.
- this activity can be performed in 3 different intervals of 10 minutes each.
- can be increased to 300 min. moderate activity / week or 150 min / week vigorous activity or a combination of the two variants for additional benefits.
- performing **physical activity of muscular endurance** at least 2 days a week, additionally.
- previously inactive persons will **benefit** from starting a **physical activity** program and progressively increasing their duration and intensity, and those with disabilities also performing physical activity as directed by the attending physician.

Rest:

- the human body in addition to healthy nutrition and physical activity needs regular rest intervals
- healthy young adult needing **7-8 hours** of quality **sleep** every day
- During periods of illness, convalescence, pregnancy, etc., the body needs more rest in order to overcome the applicant situation.